4.3 PROPOSED ACTION

Under the Proposed Action, the NMD system would be deployed at some of the potential alternative element locations listed below. For each NMD element (GBI, BMC2, IFICS Data Terminal, XBR, and fiber optic cable line), environmental analysis was performed at each known potential alternative location. Since specific locations are not currently known for the IFICS Data Terminal or the fiber optic cable line, they are addressed programmatically.

4.3.1 GROUND-BASED INTERCEPTOR

The potential GBI deployment alternatives consist of the five potential deployment sites listed in this section. Each GBI site could also include a BMC2 within the overall site boundary.

Consistent with Council on Environmental Quality regulations, the scope of the analysis presented in this EIS for the GBI deployment alternatives was defined by the range of potential environmental impacts that would result from implementation of the Proposed Action. Resources that have a potential for impacts were considered in the analysis to provide the decisionmakers with sufficient evidence and analysis for evaluation of potential effects of the action. For this EIS, the environment is discussed in terms of 15 resource areas. Of the 15 resource areas, 14 resource areas are discussed below for GBI deployment. Initial analysis indicated that the potential deployment of the GBI element would not result in short-or long-term impacts to airspace. The reasons for not addressing this resource area are briefly discussed in the following paragraph.

Airspace

Under the Proposed Action, there are no requirements for any activities at any of the GBI deployment alternatives that would potentially affect airspace. Actual use, or operation, of the GBI element would only occur in a national emergency or security situation. Airspace is not analyzed further for the following reasons:

(1) No new special use airspace proposal, or any modification to the existing special use airspace, would be necessary to accommodate these activities and because there would be no reduction in the amount of navigable airspace and thus no reduction in the amount of controlled and uncontrolled airspace.

(2) No special use airspace in the ROI, nor any modification to existing special use airspace would be required.

(3) No military training routes would need to be changed or altered.

(4) No change to an existing or planned instrument flight rules minimum flight altitude, a published or special instrument procedure, or an instrument flight rules departure procedure would be required, and, no change to a visual flight rules operation from a regular flight course or altitude would be required.

(5) These activities would not restrict access to these or any airfield or airport available for public use, and would not change any airfield/airport arrival and departure traffic flows.

(6) No air navigation or communication facility would experience any interference from these activities. In addition, transportation of the GBI to the deployment site would require less than 30 aircraft operations per year using existing transportation routes and procedures.

4.3.1.1 Air Quality

This section addresses potential environmental impacts caused by changes to the air quality environment due to the proposed construction and operation of the GBI element. Impacts considered include potential effects from ongoing or planned activities at these sites. Potential impacts were determined using the following criteria:

- Operations within attainment areas that could cause a detrimental change in attainment status of the area
- Operations within non-attainment areas that could impede or delay attainment of the NAAQS or state AAQS
- Increases in ambient air pollutant concentrations that could cause exceedances of the NAAQS or state AAQS
- Increases in air pollutant concentrations greater than 1 microgram per cubic meter (averaged over 24 hours) from new or modified major stationary sources within 10 kilometers (6 miles) of a Class I area

Air quality impacts could occur during both the construction phase and the operational phase of the Proposed Action. Emissions associated with construction activities include fugitive dust from ground disturbance, combustion byproducts from construction equipment, and emissions from solvents and architectural coatings. Potential operational air quality impacts could occur from the operation of new or upgraded heaters, boilers, and power generators, as well as emergency power supplies, vehicular emissions, and normal maintenance-related activities.

Construction

Construction of the GBI facility would require ground disturbance over an area of approximately 243 hectares (600 acres), including a construction bed-down area, truck bath, and concrete batch plant. The construction of additional support facilities, upgrades to roads, and the addition of utility corridors is also included in the 243-hectare (600-acre) disturbance estimate.

Ground disturbance would generate dust (PM-10) in the immediate vicinity of the construction. The levels of dust generated would change through time depending on the level of activity, the weather, and the condition of the ground itself. It is expected that the majority of grading would be accomplished during the first 12 months of construction and that the majority of overall ground disturbance would occur during the first 2 years. Construction causing lower levels of emissions would be anticipated to last up to 3 more years for a total of 5 years of construction with the final year changing from construction to operational emissions.

Potential emissions from mobile and stationary construction equipment as well as asphalt and architectural coating activities are also considered in the air quality analysis. As stated above, it is assumed the majority of the heavy equipment activities would be accomplished during the first 2 years.

Potential construction emissions were determined by using the Air Quality Thresholds of Significance spreadsheets (Sacramento Metropolitan Air Quality Management District, 1997). This model incorporates emission factors from various sources including the U.S. EPA. It uses conservative estimates based on building square footage, acreage disturbed, and duration of construction, as well as general meteorological and soil information. For purposes of determining the level of fugitive dust generated, it was assumed all grading would be accomplished during the first year. This results in the highest level of dust generation that could reasonably be expected and, as such, is a conservative analysis. For the purpose of determining potential exhaust emissions, it was first assumed that most of the heavy equipment use for construction would be accomplished during the first 2 years, resulting in a conservative estimate of the emissions for the first 2 years. Less heavy equipment would be used for the remaining 3 years of construction, with the fifth year's construction emissions pro-rated with operational emissions to reflect the changeover to anticipated operational status. Site-specific emissions estimates are presented in the following sections.

The Proposed Action would require construction in addition to the GBI facility at the proposed locations. This additional construction could include, but is not necessarily limited to, building or upgrading personnel support facilities (dining facility, fire station, vehicle maintenance and storage facility, and administrative facilities); installing new steam, heat, or power plants; and upgrading or building new roads and utility corridors. Specific anticipated support construction that would be required at each proposed location is listed in chapter 2.0. Emissions due to support construction activities would follow the same emission factors presented for the construction of the GBI facility and are incorporated in the estimate of area disturbed for each site.

Operation

Offsite power sources are planned for use at most proposed locations, with emergency generators supplying backup power. The emergency backup generators would be operated under appropriate permits and restrictions. Table 4.3.1.1-1 shows emissions representative of those anticipated for the proposed backup generators. The current proposal would require the installation of three 2,000-kilowatt generators, three 3,000-kilowatt generators, and appropriate aboveground fuel storage tanks. It is assumed the generators would each be operated up to 500 hours per year. Where necessary, the installation of new boilers, heaters,

or power generators (or upgrades to existing units) could cause air quality impacts through increased emissions of pollutants. Depending on the modifications required and air quality in the affected area, installation or upgrades of these sorts could require New Source Reviews, PSD analyses, and/or modification or establishment of Title V Air Permits. All areas under consideration are in attainment areas and as such no General Conformity Applicability Analysis requirements are anticipated under the Proposed Action. Potential impacts and requirements are addressed individually for each site, as applicable.

Table 4.3.1.1-1: Anticipated Emergency Generator Emissions[1]

Pollutant	Potential Annual Emissions[2] in Metric Tons Per Year (Tons Per Year)
Carbon Monoxide	25.08 (27.65)
Oxides of Nitrogen	109.50 (120.70)
Oxides of Sulfur[3]	36.90 (40.68)
PM-10	2.63 (2.90)
Volatile Organic Compounds	3.58 (3.95)
Hazardous Air Pollutants	< 0.01 (< 0.01)

Source: U.S. EPA, 1997—AP-42 Section 3.4.

[1]Assumes 500 hours of operation per year per generator

[2]Assumes the installation of three 2,000-kilowatt and three 3,000-kilowatt generators

[3]Assumes 1 percent sulfur by weight

Increases in mobile emissions could also cause increases in ambient levels of some pollutants. Pollutants from mobile sources would include hydrocarbons, carbon monoxide, nitrogen oxides, and particle emissions. The primary pollutant of concern from mobile sources in Alaska and North Dakota is carbon monoxide. As such, this is the only pollutant from mobile sources that is analyzed in this study. Up to 80 percent of carbon monoxide emissions contributing to exceedances of the NAAQS in Fairbanks have been attributed to mobile sources (Kassel, 1998—Personal communication). Cold starts during moderately cold weather, prolonged idling periods, and low-level temperature inversions all contribute to pronounced air quality impacts from motor vehicle emissions in cold climates. For analytical purposes, it was assumed that all personnel would commute individually an average of 40 kilometers (25 miles) one way to and from work at an average speed of 56 kilometers per hour (35 miles per hour). These assumptions are conservative and result in higher emission estimates than would actually be expected. Using data derived from Mobile 5b supplied by the Alaska Department of Environmental Conservation, it was determined that under these conditions each person would cause the emission of up to 430 kilograms (948 pounds) of carbon monoxide per year (Ryan, 1998—Personal

communication). Potential emissions due to operations vehicles and personal vehicles used to commute to and from work are addressed in further detail for each proposed facility and site.

Normal maintenance activities would result in the emission of relatively minor levels of pollutants, consisting primarily of particulate and volatile organic compound emissions. None of the potential sites have high ambient levels of either of these pollutants. As such, the small amounts of solvents, cleaners, paints, and grit involved in normal maintenance activities would not cause a significant impact to air quality. However, potential emissions from these activities would be accounted for in applicable operating permits, such as a site's Title V Air Permit. Maintenance-related emissions are not addressed further in the air quality analysis.

4.3.1.1.1 Alaska Installations

4.3.1.1.1.1 Clear AFS—Air Quality

Construction

Construction of the GBI facility at Clear AFS would disturb approximately 243 hectares (600 acres) and would include the missile field, BMC2, support facilities, access roads, and utilities. The majority of ground disturbance activities would last approximately 1 year, and it is anticipated that construction would take up to 5 years to complete.

The proposed construction would cause temporary localized increases in air emissions. Table 4.3.1.1-2 presents the estimate of potential emissions due to the proposed construction and site activation operations of the GBI and BMC2 at Clear AFS using the assumptions in section 4.3.1.1.

Construction would be conducted in accordance with applicable regulations and permits. While the construction would cause an increase in air pollutants, the impact would be both temporary and localized. Once construction ceased, air quality would return to its former levels. It is anticipated that the proposed construction would not cause exceedances of the NAAQS or state AAQS beyond the immediate construction zone and would not have a long-term impact to air quality in the area.

Operation

Power for the GBI and BMC2 facilities at Clear AFS would be provided from offsite commercial sources with emergency generators maintained onsite for backup power. In addition to the generators themselves, appropriate aboveground storage tanks would be installed adjacent to each generator. Table 4.3.1.1-1 shows the anticipated emissions due to

the maintenance and operation of the generators, assuming 500 hours of operation per generator per year. These generators would be incorporated in the Clear AFS Title V Air Permit and would be subject to the permitted restrictions. It is not anticipated that operation of the backup generators would require an increase in the emission levels permitted by the current Title V Air Permit. As such, there would be no anticipated impact to air quality from their operation.

Table 4.3.1.1-2: Comparison of Current and Projected Annual Emissions Due to Construction of the GBI and BMC2 at Clear AFS

	Current Base-wide Emissions[1]	Construction-related Emissions[2]			Operations Phase-in[3]
		Year 1	Year 2	Years 3-4	Year 5
Pollutant	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**
Carbon Monoxide	178 (196)	55 (61)	55 (61)	37 (41)	20 (22)
Oxides of Nitrogen	487 (537)	114 (126)	114 (126)	76 (84)	70 (77)
Oxides of Sulfur	239 (263)	7 (8)	7 (8)	5 (5)	19 (21)
PM-10	57 (63)	968 (1,066)[4]	15 (17)	11 (12)	7(8)
Volatile Organics	4 (5)	24 (27)	24 (27)	17 (19)	5 (6)
Hazardous Air Pollutants	49 (54)	--	--	--	< 1 (< 1)

[1] Current base-wide emissions reflect totals from section 3 and do not include mobile emissions.

[2] Source: derived from Sacramento Metropolitan Air Quality Management District, 1997 – Air Quality Thresholds of Significance.

Construction emission estimates include construction of the BMC2 facility and incorporate a building footprint of 30,200 square meters (325,000 square feet). Construction emissions generally generated from mobile sources and are considered temporary.

[3] Assumes there will be a period of operational run-up with a construction reduction commensurate with anticipated manpower levels. Operational emissions equivalent to 6-months anticipated operational emissions were used in this estimate.

[4] PM-10 estimates for the first year of construction include both fugitive dust and combustion emissions.

Table 4.3.1.1-3 compares the current emissions at Clear AFS and the emissions that would potentially occur from proposed operation. Clear AFS is currently a major source of air pollutants and Hazardous Air Pollutants. Operations on Clear AFS are subject to the restrictions of the station's Title V Air Permit. Activities from the Proposed Action would be incorporated into the Title V Air Permit, and would constitute a significant modification as defined by the Clean Air Act. It is anticipated that a PSD review would be necessary for the installation of the proposed backup generators at Clear AFS. If additional facilities are determined to be required for the Proposed Action (such as a dedicated power station

or steam plant), additional analysis may be required. If a major stationary source were to be installed, its use would also be subject to PSD review and could require the re-negotiation of the Title V Air Permit. Both the PSD review and the new Title V Air Permit could take an extended period of time (a year or more each) and could require additional public notification before their implementation.

Table 4.3.1.1-3: Comparison of Current and Projected Annual Emissions Due to the Operation of the GBI and BMC2 at Clear AFS

Pollutant	Annual Emissions in Metric Tons (Tons)		
	Current Base-wide Emissions[1]	Operational Emissions[2]	Projected Base-wide Emissions
Carbon Monoxide	178 (196)	25 (28)	203 (224)
Oxides of Nitrogen	487 (537)	110 (121)	597 (658)
Oxides of Sulfur	239 (263)	37 (41)	276 (304)
PM-10	57 (63)	3 (3)	60 (66)
Volatile Organics	4 (5)	4 (4)	8 (9)
Hazardous Air Pollutants	49 (54)	< 1 (< 1)	50 (55)

[1] Current base-wide emissions reflect totals from section 3.

[2] GBI/BMC2 operation emissions are based on emergency generator usage. No other emissions sources have been identified.

Clear AFS is also within relatively close proximity of the Denali National Park, which is a Class I area. However, it is not within 10 kilometers (6 miles) and would not be required to perform a PSD review based on proximity to a Class I area. Operation of the emergency generators would not be anticipated to cause decreased visibility or increased pollution concentrations within the Park's area and would not be anticipated to have an impact on Denali National Park.

Approximately 285 personnel would be required for operation of the GBI and BMC2 facilities and attendant infrastructure, resulting in a net increase in mobile emissions in the area. The extent of this increase would depend on the amount of increase in local traffic. Assuming all personnel are new, and following the assumptions outlined in section 4.3.1.1, mobile emissions from personnel would generate up to 122 metric tons (135 tons) of carbon monoxide annually. To maintain a consistent comparison of emissions, these mobile emissions are not included in table 4.3.1.1-3 because the current base operations emissions do not include similar traffic estimates. However, there are allowances for the anticipated traffic increases in the area's transportation budget for air quality emissions from vehicles. As such, increases in local traffic are not expected to result in air quality impacts.

Construction and operation of the GBI and BMC2 facilities at Clear AFS would not be anticipated to cause exceedances of the NAAQS or state AAQS and as such would not be expected to cause any change in the area's attainment status.

Cumulative Impacts

The phased-array radar upgrade at Clear AFS is currently underway and is scheduled for completion in summer 2000. Therefore, construction activities would be complete before potential NMD deployment and would not result in cumulative construction-related impacts. As discussed above, operation of the NMD activities in combination with ongoing activities at Clear AFS and in the region would not result in cumulative air quality impacts. In addition, as noted above, construction and operation of the BMC2 element for NMD combined with the GBI would not result in long-term cumulative air quality impacts.

Mitigation Measures

The implementation of standard dust suppression techniques and a vehicle maintenance program would minimize fugitive dust emissions and vehicle exhaust emissions and would help to maintain the area's high air quality.

4.3.1.1.1.2 Fort Greely—Air Quality

Construction

If Fort Greely were selected as the site of the GBI facility, the GBI facility would be south of the main base cantonment. It is estimated that as much as 243 hectares (600 acres) would be disturbed in constructing the GBI and BMC2 facilities, including upgrading roadways and the installation of backup generators and appropriate fuel storage tanks. Other existing infrastructure is sufficient to meet the requirements of the Proposed Action with only minor modifications.

The proposed construction would cause temporary localized increases in air emissions. Table 4.3.1.1-4 presents the estimate of potential emissions at Fort Greely as a result of construction and operational site activation for both the GBI and BMC2 using the assumptions in section 4.3.1.1.

Construction would be conducted in accordance with applicable regulations and permits. Although the construction would cause an increase in air pollutants, the impact would be both temporary and localized. Once construction ceased, air quality would return to its former levels. It is anticipated that the proposed construction would not cause exceedances of the NAAQS or state AAQS beyond the immediate construction zone and would not have a long-term impact to air quality in the area.

Table 4.3.1.1-4: Comparison of Current and Projected Annual Emissions Due to Construction of the GBI and BMC2 at Fort Greely

	Current Base-wide Emissions[1]	Construction-related Emissions[2]			Operations Phase-in[3]
		Year 1	Year 2	Years 3-4	Year 5
Pollutant	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**
Carbon Monoxide	3,327 (3,668)	55 (61)	55 (61)	37 (41)	20 (22)
Oxides of Nitrogen	124 (136)	114 (126)	114 (126)	76 (84)	70 (77)
Oxides of Sulfur	13 (14)	7 (8)	7 (8)	5 (5)	19 (21)
PM-10	320 (353)	968 (1,067)[4]	15 (17)	11 (12)	7(8)
Volatile Organics	37 (41)	24 (27)	24 (27)	17 (19)	5 (6)
Hazardous Air Pollutants	< 1 (< 1)	--	--	--	< 1 (< 1)

[1] Current base-wide emissions reflect totals from section 3 and do not include mobile emissions.

[2]Source: derived from Sacramento Metropolitan Air Quality Management District, 1997 – Air Quality Thresholds of Significance.

Construction emission estimates include construction of the BMC2 facility and incorporate a building footprint of 30,200 square meters (325,000 square feet). Construction emissions generally generated from mobile sources and are considered temporary.

[3]Assumes there will be a period of operational run-up with a construction reduction commensurate with anticipated manpower levels. Operational emissions equivalent to 6-months anticipated operational emissions were used in this estimate.

[4]PM-10 estimates for the first year of construction include both fugitive dust and combustion emissions.

Operation

Power for the GBI and BMC2 facilities at Fort Greely would be provided from offsite commercial sources with emergency generators maintained onsite for backup power. In addition to the generators themselves, appropriate aboveground storage tanks would be installed. Table 4.3.1.1-1 shows the anticipated emissions due to operation of the proposed generators, assuming 500 hours of operation per generator per year.

Table 4.3.1.1-5 compares the current emissions at Fort Greely and the emissions that would potentially occur from proposed site operation. Fort Greely is currently a major source of air pollutants, but not a major source of Hazardous Air Pollutants. Operations on Fort Greely are subject to the restrictions of the station's Title V Air Permit. Activities from the Proposed Action would be incorporated into the Title V Air Permit, and would constitute a significant modification as defined by the Clean Air Act. The majority of the infrastructure required for the Proposed Action is currently operational at Fort Greely. It is anticipated that the installation of the backup generators and required modifications would require a PSD review. If it is determined that additional facilities

are needed for the Proposed Action (such as a dedicated power station or steam plant), additional analysis may be required. If a new major stationary source were to be installed, its use would also be subject to PSD review and could require the re-negotiation of the Title V Air Permit. Both the PSD review and the new Title V Air Permit could take an extended period of time (a year or more for each) and could require additional public notification before their implementation. No air quality impacts would be anticipated due to the normal operational emissions of the GBI and BMC2 facilities. It is anticipated that a PSD review would be required for the installation and operation of the GBI and BMC2 facilities at Fort Greely.

Table 4.3.1.1-5: Comparison of Current and Projected Annual Emissions Due to the Operation of the GBI and BMC2 at Fort Greely

Pollutant	Annual Emissions in Metric Tons (Tons)		
	Current Base-wide Emissions[1]	Operational Emissions[2]	Projected Base-wide Emissions
Carbon Monoxide	3,327 (3,668)	25 (28)	3,352 (3,696)
Oxides of Nitrogen	124 (136)	110 (121)	234 (257)
Oxides of Sulfur	13 (14)	37 (41)	50 (55)
PM-10	320 (353)	3 (3)	323 (356)
Volatile Organics	37 (41)	4 (4)	41 (45)
Hazardous Air Pollutants	< 1 (< 1)	< 1 (< 1)	< 1 (< 1)

[1] Current base-wide emissions reflect totals from section 3.

[2] GBI/BMC2 operation emissions are based on emergency generator usage. No other emissions sources have been identified.

Fort Greely is not within 10 kilometers (6 miles) of a Class I area, and the proposed construction and operation would not be required to perform a PSD review based on proximity to any Class I area. Construction and operation of the GBI at Fort Greely is not anticipated to have an impact on any Class I area.

Approximately 390 additional personnel would be required for operation of the GBI and BMC2 facilities and attendant infrastructure, resulting in a net increase in mobile emissions in the area. The extent of this increase would depend on the amount of increase in local traffic. Assuming all personnel are new, and following the assumptions outlined in section 4.3.1.1, mobile emissions from personnel would generate approximately 168 metric tons (185 tons) of carbon monoxide annually. In order to maintain a consistent comparison, these emissions are not included in the proposed NMD operations because the current base emission inventory operation

emissions do not include traffic emissions. However, there are allowances for anticipated traffic increases in the area's transportation budget. As such, project-related traffic is not expected to impact air quality.

Construction and operation of the GBI and BMC2 facilities at Fort Greely would not be anticipated to cause exceedances of the NAAQS or state AAQS and as such would not be expected to cause any change in the area's attainment status.

Cumulative Impacts

One program has been identified that could have a cumulative impact with the Proposed Action. This program is the construction of new power lines from the Richardson Highway to the Alascom Microwave site. The installation of the power lines would have relatively little impact on air quality and is not a potential source of cumulative impacts. In addition, as noted above, construction and operation of the BMC2 element for NMD combined with the GBI would not result in long-term cumulative air quality impacts.

Mitigation Measures

The implementation of standard dust suppression techniques and a vehicle maintenance program would minimize fugitive dust emissions and vehicle exhaust emissions and would help to maintain the area's current high air quality.

4.3.1.1.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Air Quality

Construction

The proposal to locate the GBI facility within the Yukon Training Area includes the use of Eielson AFB for support services. It would require the widening and paving of access roads to the site, the establishment of new utility corridors, installation of a series of backup generators and fuel storage facilities, and a wastewater treatment facility. Some buildings on Eielson AFB would require minor modification. The BMC2 facility would be collocated with the GBI facility under this option. In all, approximately 243 hectares (600 acres) of ground would be disturbed during construction of the GBI, BMC2, and support facilities.

The proposed construction would cause temporary localized increases in air emissions. Table 4.3.1.1-6 presents the estimate of potential emissions at Eielson AFB and the Yukon Training Area from construction and operational site activation for both the GBI and BMC2 using the assumptions in section 4.3.1.1.

Table 4.3.1.1-6: Comparison of Current and Projected Annual Emissions Due to Construction of the GBI and BMC2 at Yukon Training Area/Eielson AFB

	Current Base-wide Emissions[1]	Construction-related Emissions[2]			Operations Phase-in[3]
		Year 1	Year 2	Years 3-4	Year 5
Pollutant	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**
Carbon Monoxide	--	55 (61)	55 (61)	37 (41)	20 (22)
Oxides of Nitrogen	--	114 (126)	114 (126)	76 (84)	70 (77)
Oxides of Sulfur	--	7 (8)	7 (8)	5 (5)	19 (21)
PM-10	--	967 (1,066)[4]	15 (17)	11 (12)	7(8)
Volatile Organics	--	24 (27)	24 (27)	17 (19)	5 (6)
Hazardous Air Pollutants	--	--	--	--	< 1 (< 1)

[1] The Yukon Training Area has no permanent stationary emissions sources. As noted in section 3, it is purposely maintained in an undeveloped state to facilitate military training and exercises. Emissions in the area are limited to mobile source emissions from military vehicles and mobile generators. No emissions inventory has been identified.

[2]Source: derived from Sacramento Metropolitan Air Quality Management District, 1997 – Air Quality Thresholds of Significance.

Construction emission estimates include construction of the BMC2 facility and incorporate a building footprint of 30,200 square meters (325,000 square feet). Construction emissions generally generated from mobile sources and are considered temporary.

[3]Assumes there will be a period of operational run-up with a construction reduction commensurate with anticipated manpower levels.

Operational emissions equivalent to 6-months anticipated operational emissions were used in this estimate.

[4]PM-10 estimates for the first year of construction include both fugitive dust and combustion emissions.

Construction would be conducted in accordance with applicable regulations and permits. Although the construction would cause an increase in air pollutants, the impact would be both temporary and localized. Once construction ceased, air quality would return to its former levels. It is anticipated that the proposed construction would not cause exceedances of the NAAQS or state AAQS beyond the immediate construction zone and would not have a long-term impact to air quality in the area.

Operation

Power for the GBI facility and BMC2 would be provided by an offsite source. A series of backup generators would be maintained in the event of a power outage and would require appropriate operating permits.

Table 4.3.1.1-1 shows the anticipated emissions due to operation of the proposed generators, assuming 500 hours of operation per generator per year.

Eielson AFB is a major source of air pollutants and a major source of Hazardous Air Pollutants and maintains a Title V Air Permit limiting the

emission of pollutants. Under normal operations, both the BMC2 and the GBI facility would generate minimal emissions, the majority of which would come from the operation of the backup generators. The proposed location of the GBI and BMC2 facilities is geographically detached from Eielson AFB. In addition, Eielson AFB does not maintain administrative control over the Yukon Training Area. Therefore, the operation of the backup generators would not be incorporated into the base Title V Air Permit. Appropriate permits would be required for the backup generators and facilities. Because the size and anticipated operation of the generators, they may require a Title V Air Permit. This permit could take a year or more to obtain. It is also anticipated that a formal PSD review could be required before the installation of the generators within the Yukon Training Area. The PSD review process would be expected to require a year or more to complete.

If additional emissions sources (such as a dedicated power station or steam plant) were determined to be required, additional analysis would be required. If a new major stationary source were to be installed it would be subject to PSD review and would require the establishment of a Title V Air Permit. Both of these tasks would require an extended amount of time (a year or more for each) and would require additional public notification and consultation before their implementation. Table 4.3.1.1-7 summarizes the potential emissions due to operation of the BMC2 and GBI facilities within the Yukon Training Area.

Table 4.3.1.1-7: Comparison of Current and Projected Annual Emissions Due to the Operation of the GBI and BMC2 at the Yukon Training Area/Eielson AFB

Pollutant	Annual Emissions in Metric Tons (Tons)		
	Current Area-wide Emissions	Operational Emissions	Projected Area-wide Emissions
Carbon Monoxide	--	25 (28)	25 (28)
Oxides of Nitrogen	--	110 (121)	110 (121)
Oxides of Sulfur	--	37 (41)	37 (41)
PM-10	--	3 (3)	3 (3)
Volatile Organics	--	4 (4)	4 (4)
Hazardous Air Pollutants	--	< 1 (< 1)	< 1 (< 1)

(1) Current area-wide emissions reflect the fact that, as noted in section 3, Yukon Training Area is an undeveloped area with no permanent emissions sources. Emissions in the area are limited to intermittent mobile sources due to military maneuvers in the area. No comprehensive inventory has been identified.

(2) GBI/BMC2 operation emissions are based on emergency generator usage. No other emissions sources have been identified.

No air quality impacts would be anticipated due to the normal operational emissions of the proposed GBI and BMC2 facilities. It is anticipated that a PSD review could be required prior to the installation and operation of the GBI and BMC2 facilities within the Yukon Training Area.

Neither Eielson AFB nor the Yukon Training Area is within 10 kilometers (6 miles) of a Class I area, and no PSD review would be required based on proximity to a Class I area. The proposed construction and operation would not be expected to impact any Class I area.

Approximately 285 additional personnel would be required for operation of the GBI and BMC2 facilities and attendant infrastructure, resulting in a net increase in mobile emissions in the area. The extent of this increase would depend on the amount of increase in local traffic. Assuming all personnel are new, and following the assumptions outlined in section 4.3.1.1, mobile emissions from personnel would generate up to 122 metric tons (135 tons) of carbon monoxide annually. To maintain a consistent comparison, these emissions are not included in the proposed NMD operations because the current base emissions inventory operation emissions do not include traffic emissions. However, there are allowances for anticipated traffic increases in the area's transportation budget. As such, project-related traffic is not expected to impact air quality.

Neither Eielson AFB nor the proposed GBI facility location is within the boundaries of the Fairbanks/North Pole non-attainment area; thus, a Conformity Applicability Analysis is not required. The majority of the NAAQS and state AAQS exceedances occur in downtown Fairbanks in areas of high traffic density (Kassel, 1998—Personal communication). It is unlikely that the majority of personnel who live off-base would be living or commuting through the areas most often affected by exceedances and would not be expected to contribute substantially to any future exceedances.

In addition, Alaska maintains a strict inspection and certification program to minimize mobile emissions that have been identified as a primary contributor to exceedances of the NAAQS in Fairbanks and North Pole. Vehicles that will be used in the Fairbanks North Star Borough will be subject to the requirements of this program. It is anticipated that adherence to this program would result in project-related mobile emissions having negligible impact on the Fairbanks/North Pole non-attainment status. (Kassel, 1998—Personal communication)

Construction and operation of the GBI and BMC2 facilities at the Yukon Training Area/Eielson AFB would not be anticipated to cause or contribute to exceedances of the NAAQS or state AAQS and as such would not be expected to cause any change in the area's attainment status.

Cumulative Impacts

The primary activities in the Yukon Training Area and at Eielson AFB would not have cumulative impacts with construction or operation of the GBI and BMC2 facilities. Two construction efforts have been identified at the Yukon Training Area that could have potential for cumulative air quality impacts within the Yukon Training Area. The first is continued infrastructure upgrades throughout the Yukon Training Area, including minor road upgrades and utility upgrades. These upgrades would result in minor levels of intermittent fugitive dust and exhaust emissions. Due to the sporadic nature of the emissions, the low levels of equipment exhaust, and the general localized nature of the emissions, it is unlikely that these upgrades would have a measurable cumulative impact on air quality. The second construction project identified is the establishment of a new urban training site. The specific location of the new urban training site has not yet been determined. However, it is anticipated that it will be physically removed from the proposed GBI and BMC2 sites. As such, the potential for any cumulative impact is small. Emissions of ozone precursors from these construction projects would be cumulative in nature due to the time-delayed nature of these pollutants. However, the lack of industry in the area combined with the current low ambient levels of ozone indicate that any cumulative impact would be slight and would not be likely to cause an exceedance of the NAAQS or state AAQS or a change in the area's attainment status. It is anticipated that operation of the GBI site in combination with operation of the BMC2 would not result in cumulative air quality impacts.

Mitigation Measures

Standard dust suppression techniques would be implemented to minimize fugitive dust levels. Adherence to an appropriate vehicle maintenance program would reduce exhaust emissions and would also reduce associated cumulative impacts. In addition, it is recommended that head bolt electrical outlets be installed in parking areas at the proposed site. The use of head bolt outlets allows vehicles to use engine preheating accessories to reduce cold starts, which have been linked to increases in both carbon monoxide and unburned fuel emissions.

4.3.1.1.2 North Dakota Installations

4.3.1.1.2.1 Grand Forks—Air Quality

Construction

The proposed installation of the GBI and BMC2 facilities at Grand Forks AFB would not require the installation of support services or upgrades to existing services. Ground disturbance would be limited to a maximum of approximately 162 hectares (400 acres).

The proposed construction would cause temporary localized increases in air emissions. Table 4.3.1.1-8 presents the estimate of potential emissions at Grand Forks AFB from construction and operational site activation for both the GBI and BMC2 using the assumptions in section 4.3.1.1.

Table 4.3.1.1-8: Comparison of Current and Projected Annual Emissions Due to Construction of the GBI and BMC2 at Grand Fork AFB

	Current Base-wide Emissions[1]	Construction-related Emissions[2]			Operations Phase-in[3]
		Year 1	Year 2	Years 3-4	Year 5
Pollutant	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**
Carbon Monoxide	11 (13)	41 (45)	41 (45)	27 (30)	18 (20)
Oxides of Nitrogen	132 (145)	81 (89)	81 (89)	54 (59)	66 (72)
Oxides of Sulfur	4 (5)	5 (5)	5 (5)	3 (3)	19 (21)
PM-10	2 (2)	885 (976)[4]	11 (12)	7 (8)	3 (3)
Volatile Organics	10 (11)	18 (20)	18 (20)	13 (14)	5 (5)
Hazardous Air Pollutants	1 (1)	--	--	--	< 1 (< 1)

[1] Current base-wide emissions reflect totals from section 3 and do not include mobile emissions.

[2] Source: derived from Sacramento Metropolitan Air Quality Management District, 1997 – Air Quality Thresholds of Significance.

Construction emission estimates include construction of the BMC2 facility and incorporate a building footprint of 23,200 square meters (250,000 square feet). Construction emissions generally generated from mobile sources and are considered temporary.

[3] Assumes there will be a period of operational run-up with a construction reduction commensurate with anticipated manpower levels. Operational emissions equivalent to 6-months anticipated operational emissions were used in this estimate.

[4] PM-10 estimates for the first year of construction include both fugitive dust and combustion emissions.

Construction would be conducted in accordance with applicable regulations and permits. While the construction would cause an increase in air pollutants, the impact would be both temporary and localized. Once construction ceased, air quality would return to its former levels. It is anticipated that the proposed construction would not cause exceedances of the NAAQS or state AAQS beyond the immediate construction zone and would not have a long-term impact to air quality in the area.

Operation

Power for the GBI and BMC2 facilities at Grand Forks AFB would be provided from offsite commercial sources with emergency generators maintained onsite for backup power. In addition to the generators

themselves, appropriate aboveground storage tanks would be installed. Table 4.3.1.1-1 shows the anticipated emissions due to operation of the proposed generators, assuming 500 hours of operation per generator per year.

Table 4.3.1.1-9 compares the current emissions at Grand Forks AFB and the emissions that would potentially occur from NMD operation. Grand Forks is currently a major source of air pollutants, but not a major source of Hazardous Air Pollutants. Operations on Grand Forks AFB are subject to the restrictions of the base Title V Air Permit. Activities from the Proposed Action would be incorporated into the Title V Air Permit, and would constitute a significant modification as defined by the Clean Air Act. As such, a PSD review may be required, though update to the Title V Air Permit may be sufficient. The support services required for the Proposed Action are currently operational at Grand Forks AFB. No air quality impacts would be anticipated due to the normal operational emissions of the GBI and BMC2 facilities.

Table 4.3.1.1-9: Comparison of Current and Projected Annual Emissions Due to the Operation of the GBI and BMC2 at Grand Forks AFB

Pollutant	Annual Emissions in Metric Tons (Tons)		
	Current Base-wide Emissions	Operational Emissions	Projected Base-wide Emissions
Carbon Monoxide	11 (13)	25 (28)	36 (41)
Oxides of Nitrogen	132 (145)	110 (121)	242 (266)
Oxides of Sulfur	4 (5)	37 (41)	41 (46)
PM-10	2 (2)	3 (3)	5 (5)
Volatile Organics	10 (11)	4 (4)	14 (15)
Hazardous Air Pollutants	1 (1)	< 1 (< 1)	1(1)

(1) Current base-wide emissions reflect totals from section 3.

(2) GBI/BMC2 operation emissions are based on emergency generator usage. No other emissions sources have been identified.

Approximately 285 additional personnel would be required for operation of the GBI and BMC2 facilities and attendant infrastructure. This would result in a net increase in mobile emissions in the area. The extent of this increase would depend on the amount of increase in local traffic. Assuming all personnel are new, and following the assumptions outlined in section 4.3.1.1, mobile emissions from personnel would generate up to 122 metric tons (135 tons) of carbon monoxide annually. To maintain a consistent comparison of emissions, these mobile emissions are not included because the current base operations emissions do not include similar traffic estimates. However, there are allowances for the

anticipated traffic increases in the area's transportation budget. As such, increases in local traffic are not expected to result in air quality impacts.

Construction and operation of the GBI and BMC2 facilities at Grand Forks AFB would not be anticipated to cause exceedances of the NAAQS or state AAQS and as such would not be expected to cause any change in the area's attainment status.

Cumulative Impacts

Several ongoing or planned projects in the city of Grand Forks and at Grand Forks AFB could have a cumulative impact with the Proposed Action. These include ongoing Devils Lake restoration and Grand Forks City restoration projects, and planned construction of a new commissary, a new squadron operations facility, additional flightline parking, and modification of the on-post gymnasium. It is likely that the projects would have sufficient physical separation that fugitive dust emissions would not have a cumulative effect, especially with the implementation of dust suppression techniques. It is likely that emissions of ozone precursors would have a negligible cumulative impact. Construction emissions are intermittent, depending on the current activity level and types of construction action taking place at each source location. The predominant weather patterns tend to disperse pollutants vertically as well as horizontally. As such, any impact due to cumulative actions would be expected to be minor and transitory. In addition, it is not anticipated that operation of the GBI site along with the BMC2 would result in long-term cumulative air quality impacts.

Mitigation Measures

Standard construction techniques would be implemented to minimize fugitive dust emissions and exhaust emissions. These methods could include periodic watering of disturbed ground and proper maintenance of construction equipment.

4.3.1.1.2.2 Missile Site Radar—Air Quality

Construction

The proposed installation of the GBI and BMC2 facilities at the Missile Site Radar would cause the disturbance of up to approximately 170 hectares (420 acres). It would include the installation of the GBI facility on the eastern half of the site and the BMC2 on the western portion. Additional construction could include, but would not necessarily be limited to, new or improved roadways, the installation of backup generators and fuel tanks, a steam plant, a fire station, and a vehicle fueling facility.

The proposed construction would cause temporary localized increases in air emissions. Table 4.3.1.1-10 presents the estimate of potential emissions at the Missile Site Radar from construction and operational site activation for both the GBI and BMC2 using the assumptions in section 4.3.1.1.

Table 4.3.1.1-10: Comparison of Current and Projected Annual Emissions Due to Construction of the GBI and BMC2 at Missile Site Radar

	Current Base-wide Emissions[1]	Construction-related Emissions[2]			Operations Phase-in[3]
		Year 1	Year 2	Years 3-4	Year 5
Pollutant	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**
Carbon Monoxide	--	60 (66)	60 (66)	40 (44)	20 (23)
Oxides of Nitrogen	--	103 (113)	103 (113)	68 (75)	69 (76)
Oxides of Sulfur	--	5 (6)	5 (6)	4 (4)	19 (21)
PM-10	--	932 (1,027)[4]	13 (14)	8 (9)	3 (3)
Volatile Organics	--	24 (26)	24 (26)	16 (18)	5 (6)
Hazardous Air Pollutants	--	--	--	--	< 1 (< 1)

[1] Current base-wide emissions reflect totals from section 3 and do not include mobile emissions. Missile Site Radar is currently in caretaker status and as such has no appreciable air pollution emissions.

[2] Source: derived from Sacramento Metropolitan Air Quality Management District, 1997 – Air Quality Thresholds of Significance.

Construction emission estimates include construction of the BMC2 facility and incorporate a building footprint of 37,200 square meters (400,000 square feet). Construction emissions generally generated from mobile sources and are considered temporary.

[3] Assumes there will be a period of operational run-up with a construction reduction commensurate with anticipated manpower levels. Operational emissions equivalent to 6-months anticipated operational emissions were used in this estimate.

[4] PM-10 estimates for the first year of construction include both fugitive dust and combustion emissions.

Construction would be conducted in accordance with applicable regulations and permits. While the construction would cause an increase in air pollutants, the impact would be both temporary and localized. Once construction ceased, air quality would return to its former levels. It is anticipated that the proposed construction would not cause exceedances of the NAAQS or state AAQS beyond the immediate construction zone and would not have a long-term impact to air quality in the area.

Operation

Power for the GBI and BMC2 facilities at the Missile Site Radar would be provided from offsite commercial sources with emergency generators maintained onsite for backup power. In addition to the generators themselves, appropriate aboveground storage tanks would be installed. Table 4.3.1.1-1 shows the anticipated emissions due to operation of the proposed generators, assuming 500 hours of operation per generator per year.

Table 4.3.1.1-11 compares the current emissions at the Missile Site Radar and the emissions that would potentially occur from the Proposed Action. The Missile Site Radar is currently in caretaker status and has only negligible emissions associated with groundskeeping, security activities, and minimal maintenance required to maintain the unused facilities. It is anticipated that operation of the GBI and BMC2 would constitute a major stationary source and would require a Title V Air Permit. As such, the site could be subject to PSD review. The backup generators and other emissions-related activities would be subject to permitted constraints and would not be anticipated to cause exceedances of the NAAQS or state AAQS and would not be expected to cause or contribute to a detrimental change in the area's attainment status.

Table 4.3.1.1-11: Comparison of Current and Projected Annual Emissions Due to the Operation of the GBI and BMC2 at Missile Site Radar

Pollutant	Annual Emissions in Metric Tons (Tons)		
	Current Base-wide Emissions	Operational Emissions	Projected Base-wide Emissions
Carbon Monoxide	--	25 (28)	25 (28)
Oxides of Nitrogen	--	110 (121)	110 (121)
Oxides of Sulfur	--	37 (41)	37 (41)
PM-10	--	3 (3)	3 (3)
Volatile Organics	--	4 (4)	4 (4)
Hazardous Air Pollutants	--	< 1 (< 1)	< 1 (< 1)

(1)Current base-wide emissions reflect totals from section 3. As noted in section 3, Missile Site Radar is in caretaker status and has no appreciable emissions.

(2)GBI/BMC2 operation emissions are based on emergency generator usage. No other emissions sources have been identified.

Both the Title V Air Permit and PSD review would take an extended period of time to complete (a year or more for each) and may require additional public notification before implementation. If the site is required to establish a Title V Air Permit, the Proposed Action would be

incorporated in the permit, which would then limit activities as applicable. Even if the site is required to obtain a Title V Air Permit, it is not anticipated that the Proposed Action would cause exceedances of the NAAQS or state AAQS and would not cause or contribute to a detrimental change in the area's attainment status.

Approximately 390 additional personnel would be required for operation of the GBI and BMC2 facilities and attendant infrastructure, resulting in a net increase in mobile emissions in the area. The extent of this increase would depend on the amount of increase in local traffic. Assuming all personnel are new, and following the assumptions outlined in section 4.3.1.1, mobile emissions from personnel would generate approximately 168 metric tons (185 tons) of carbon monoxide annually. In order to present a consistent comparison, these mobile emissions are not included in the proposed NMD operations emissions. However, allowances for anticipated traffic increases are incorporated into the area's transportation budget. This allowance, the prevailing weather patterns, the low population density, and the lack of industry in the area would all tend to indicate that there would be no air quality impact from this level of increased vehicle use in the area.

Construction and operation of the GBI and BMC2 facilities at the Missile Site Radar would not be anticipated to cause exceedances of the NAAQS or state AAQS and as such would not be expected to cause any change in the area's attainment status.

Cumulative Impacts

The Missile Site Radar is currently in caretaker status. No local projects including the BMC2 that could be deployed at this site have been identified that would contribute to a cumulative impact on air quality. However, it is possible that an XBR could be established at one of the neighboring Remote Sprint Launch Sites, approximately 12 to 26 kilometers (7.5 to 16 miles) from the Missile Site Radar.

Operational requirements for the XBR include the potential installation of a 7,500-kilowatt power generation facility. Potential impacts because of the operation of this power plant are addressed in section 4.3.4.1.2.3. It is possible that deployment of the GBI and XBR elements could have a cumulative operations-related impact due to their relatively close proximity.

Emissions from each of the sites (the Missile Site Radar and the Remote Sprint Launch Sites) would be limited by their respective Air Quality Permits. The emissions limits imposed by these permits take emissions from other locations into account. As such, it is not anticipated that the cumulative impacts from the operation of both sites would cause

exceedances of the NAAQS or state AAQS, and would not cause a change in the area's attainment status.

The Missile Site Radar is currently inactive. The only other project that could represent the potential for cumulative construction-related impacts would be the potential dismantlement and destruction of some facilities at this site. This activity would need to be mostly completed before the start of the main NMD construction activities. It is possible that there could be some overlap of construction operations. It is anticipated that this overlap, if it were to occur, would take the form of initial NMD-related construction conducted during the same time frame as the final cleanup operations from any demolition or dismantlement operations (i.e., removal of rubble and debris and replanting of the site, if required). If the construction operations were in relatively close proximity to each other, simultaneous operations could cause a cumulative impact to air quality. Cumulative impacts could occur due to both increased fugitive dust (PM-10) emissions and increased exhaust emissions. Specific impacts would depend on emission rates, which would vary depending on the levels and types of ongoing activities at the individual construction sites, and on meteorological conditions, which generally favor rapid dispersion of pollutants in North Dakota. Due to the localized and temporary nature of the construction emissions, it is unlikely that the simultaneous construction projects would cause exceedances of the NAAQS or state AAQS beyond the immediate construction areas and would not be expected to affect the region's attainment status. No other activities occur at the site or are planned at the site that could represent a cumulative impact with NMD deployment. No regional activities occur or are planned that would result in either short- or long-term cumulative air quality impacts.

Mitigation Measures

Standard construction dust suppression techniques would be utilized to minimize fugitive dust emissions. These may include, but are not limited to, periodic watering of disturbed soil and application of soil stabilizers to disturbed areas that are not being actively worked. Adherence to an appropriate maintenance plan to assure vehicle readiness and reliability would also minimize exhaust emissions.

4.3.1.2 Biological Resources

Numerous Federal and state regulations exist that address issues and concerns related to biological resources. Federal regulations include, but are not limited to, the Endangered Species Act, the Marine Mammal Protection Act, and the CWA. Federal and state regulatory standards and guidelines have been applied in determining the potential impacts associated with the Proposed Action. In addition, as part of the EIS process, the NMD program has been consulting with the USFWS and NMFS (see section 9.0 and appendix D). The following criteria were used to identify potential impacts:

- The number or amount of the resource that could be impacted relative to its occurrence at the project sites
- The sensitivity of the resource to proposed activities
- The duration of the impact

Impacts are considered if they have the potential to:

- Result in reduction of the population size of Federally listed threatened or endangered species
- Degrade biologically important, critical, or unique habitats
- Result in substantial long-term loss of vegetation
- Reduce the capacity of a habitat to support wildlife

Ground disturbance, habitat loss, noise from demolition and construction, and an increase in personnel during construction and operation of a new GBI field at any of the alternatives in Alaska or North Dakota could result in impacts to biological resources present in the area. All utilities would be underground, and no towers are associated with the proposed GBI field. Ground disturbance would result in removal of vegetation and small areas of wetlands at some locations and a reduction in available habitat. The majority of the proposed sites provide only limited habitat for wildlife due to fencing and mowing. Ground disturbance and other construction activities may also potentially result in the displacement or death of less mobile, burrowing species of wildlife if burrows are crushed or filled. Although there are currently no plans that would affect inland anadromous fish, the NMFS recommends that cables crossing anadromous streams should be directionally bored, with no surface disturbance within 30 meters (100 feet) of ordinary high water on each side of the stream (National Marine Fisheries Service, 1999—Comments received by EDAW, Inc. regarding the NMD Deployment Draft EIS).

Wetlands can be impacted both directly and indirectly. Direct impacts can result from filling, dredging, or flooding. Indirect impacts can be caused by disturbance to adjacent land that results in degradation of

water quality from chemical or sedimentary runoff. Wetlands will be avoided when possible. Disturbance to wetlands would be minimized by using appropriate techniques to control runoff and other Best Management Practices such as stabilizing fill slopes from erosion and the use of hay bales to filter sediment from storm water runoff from construction sites.

Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 dBA to 95 dBA. Since the proposed locations are in predominately rural settings, the average background noise levels are 55 dBA. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. Although flushing would slightly increase individual energy expenditure, construction is not expected to have a significant effect on wildlife since sufficient foraging and feeding habitat occurs in adjacent areas. Some wildlife may leave the area permanently, while others may likely become accustomed to the increased noise and human presence. The presence of personnel may cause wildlife to avoid the area, at least temporarily, but would therefore further reduce the potential for impacts from elevated noise levels. The level of impact to listed species in areas proposed for the GBI field is expected to be minimal since these species are not known to regularly occur within the construction ROI and thus are not anticipated to experience noise levels from construction of sufficient magnitude to cause disturbance.

During operation, the GBI field would be dormant except for occasional building maintenance activities (painting, building repair, landscaping). Only minor, short-term impacts to wildlife, such as startling, are anticipated as a result of these activities. Security lighting could potentially attract wildlife to the project areas; however, any impacts, such as startling when personnel are in the area, would be minimal.

4.3.1.2.1 Alaska Installations

4.3.1.2.1.1 Clear AFS—Biological Resources

Clear AFS has been selected as a potential location for GBI deployment. This would require grading 243 hectares (600 acres), less than 5 percent of the total acreage on the station, for construction of a GBI field, and construction of a new access road and utility corridors (figure 2.4.1-1).

Vegetation

Construction. Approximately 182 hectares (450 acres) of aspen-birch forest, 20 hectares (50 acres) of aspen-black spruce forest, and possibly up to 20 hectares (50 acres) of gravel barrens habitat would be removed during construction of the Alternative A GBI field. This area represents a

small portion of the total vegetation available on-base. Although gravel barrens can possess unique plants, there is no evidence that they provide critical habitat for wildlife (Clear AS, 1996—Biodiversity Survey of Clear AS, Alaska). Construction would remove less than 5 percent of the total gravel barrens located on the station.

Approximately 107 hectares (265 acres) of aspen-black spruce forest, 105 hectares (260 acres) of black spruce forest and woodland, and 30 hectares (75 acres) of aspen-birch forest could be removed during construction of the GBI field at Site B. This area also represents a small portion of the total vegetation available on-base.

Operation. No impacts to vegetation are anticipated during operation of the GBI field.

Wildlife

Construction. Construction activities could potentially remove vegetation used by migratory or other nesting birds. However, less than 5 percent of the total vegetation available on-base would be removed.

Wildlife in the immediate area (moose, bears, lynx, and migrating and resident birds such as the olive-sided flycatcher, northern goshawk, and harlequin duck) could be startled by construction noise and possibly avoid or leave the area during construction. In addition, some less mobile species may be lost because of the reduction of habitat as a result of the NMD program. No major wildlife corridors would be disturbed. The Nenana River, a designated anadromous fish stream west of the proposed GBI sites, would not be impacted by construction or operation activities.

Operation. During operation, the GBI field would be dormant except for occasional maintenance activities. Only minor, short-term impacts to wildlife, such as startling during periods when personnel are in the area, are anticipated as a result of these activities. While security lighting could potentially attract wildlife to the project areas, adverse impacts would be minimal.

Threatened and Endangered Species

Construction. No Federal or state listed threatened or endangered plant or wildlife species or critical habitat has been identified at Clear AFS. Protected bird species and the peregrine falcon, which was recently delisted but will continue to be monitored, may migrate through the area, and therefore could potentially be disturbed by construction-related noise. However, this unlikely disturbance would be short-term and is not expected to alter migration patterns.

Operation. During operation, the GBI field would be dormant except for occasional maintenance activities. Only minor, short-term impacts to wildlife, such as startling during periods when personnel are in the area, are anticipated as a result of these activities. While security lighting could potentially attract sensitive wildlife to the project areas, adverse impacts would be minimal.

Sensitive Habitat

Construction. Construction activities could cause impacts to approximately 2.7 hectares (6.6 acres) of wetlands if Site A is selected or 55 hectares (135 acres) of wetlands if Site B is chosen. These wetlands do provide habitat for several state species of concern such as the olive-sided flycatcher, gray-cheeked thrush, Townsend's warbler, and blackpoll warbler. Actual siting of the GBI field could reduce impacts by avoiding wetlands where practicable. Another small area (0.4 hectare [1 acre]) of wetlands would be impacted by construction of the housing/administrative facilities. The wetlands could potentially be affected by the project through filling, draining, trenching, and other general construction activities. Because wetlands generally provide wildlife habitat, any significant changes to the wetlands would likely result in subsequent impacts on wildlife in the area. Wetlands associated with the Nenana River are located west of the site and would not be affected by program activities.

As mentioned above, wetlands would be avoided to the extent practicable. Best Management Practices such as stabilizing fill slopes from erosion and the use of hay bales to filter sediment from storm water runoff would be implemented. Section 404 permits and state 401 water quality certification will be obtained after actual siting of the GBI field and before any discharge of fill material (McConnell, 1999—Comments received by EDAW, Inc. regarding the Coordinating Draft NMD Deployment DEIS). The Alaska water quality certification would declare that any discharge to navigable waters would comply with applicable provisions of the Clean Water Act, including water quality standards. Compliance with the required wetlands permits would also work to minimize impacts. Maintenance of wetland quality and value would be coordinated with applicable agencies. The permitting process would entail review of proposed activities and possible mitigations by all interested parties and applicable agencies.

Operation. No impacts to sensitive habitat are anticipated during operation of the GBI field.

Cumulative Impacts

Cumulative impacts would result from increased activity during construction and loss of habitat at the proposed site. Additional similar

habitat in the region would minimize these impacts. Although the BMC2 element could be deployed within the same area as the GBI site, no additional cumulative impacts would be expected. According to a USFWS report (Dahl, 1990—Wetlands Losses in the United States) on wetland losses in the United States, wetlands are disappearing at a rapid rate, even though measures to stem the losses are being developed and implemented. Wetland habitat, in the country as a whole, has been destroyed mainly by agricultural drainage and flood control. Road construction, expansions of cities, industrial sites, and resorts also have contributed to the reduction of wetlands. The Conterminous United States has lost an estimated 53 percent of its original wetlands over the past 200 years (Dahl, 1990—Wetlands Losses in the United States). Approximately 45 percent of Alaska's surface area is wetlands and it is the only state where wetlands have not been substantially reduced (approximately 1 percent) (Dahl, 1990—Wetlands Losses in the United States). An estimated 69 million hectares (170 million acres) of wetlands remain in Alaska (Dahl, 1990—Wetlands Losses in the United States). Filling in up to 2.7 hectares (6.6 acres) of wetlands at Site B would reduce the amount of wetlands on Clear AFS by 0.06 percent. Filling in up to 55 hectares (135 acres) of wetlands (Site A) would reduce the amount of wetlands by approximately 12 percent at the base. However, construction on either site would contribute only slightly to the cumulative reduction of wetlands in the region and state.

No other future programs that could contribute to cumulative biological resource impacts have been identified at Clear AFS or within the region.

Mitigation Measures

The permitting process will be conducted in accordance with the U.S. EPA's guidelines for evaluating Section 404 permitting applications found in Section 404 (b)(1) of the Clean Water Act. Section 401 water quality certification provided by the State of Alaska could include effluent and other limitations as well as monitoring requirements. Mitigation measures would be developed during the permitting process once a site has been selected. Agency-recommended mitigations would take into account the size and quality of the wetlands involved. Mitigations for wetlands could include (1) avoidance of direct and indirect disturbance of wetlands through facility redesign; (2) on-base (if possible) replacement of any wetlands lost at a ratio determined through consultation with the U.S. Army Corps of Engineers; (3) restoration/enhancement of wetland habitat elsewhere on the base or purchase and fencing of any off-base replacement habitat; and (4) monitoring (until habitat becomes well established) of any replacement wetlands as required to determine the effectiveness of replacement and any remedial measures. Avoidance of impacts, where practicable, represents the lowest cost mitigation and can be accomplished in a shorter time frame than wetland replacement. Because the creation or development of wetlands represents a substantial

financial investment, and the process may take several years to complete, this option is often reserved for wetland mitigation of high quality or for sizable area of affected wetlands. The probability of success that a newly created wetland would survive and flourish could vary, which sometimes makes this option less desirable than wetland restoration or avoidance.

Avoiding disturbance to the wetlands could include controlling runoff from construction and operation sites into the wetland through use of berms, silt curtains, straw bales, and other appropriate techniques. Equipment should be washed in areas where wastewater can be contained and treated or evaporated.

4.3.1.2.1.2 Fort Greely—Biological Resources

Fort Greely has been selected as a potential location for GBI deployment. Construction of a GBI field would require grading 243 hectares (600 acres), including new access roads and utility upgrades.

Vegetation

Construction. The proposed area for construction of a GBI field has been disturbed by past and present training missions. The vegetation at the proposed site was burned in a 1999 wildfire. The GBI field would be sited in an area that was once composed of mixed forest and deciduous/high brush, which represents a small percentage of the total vegetation on Fort Greely. The areas where roads would be upgraded or constructed are also composed of mixed forest and deciduous high brush. No sensitive vegetation species have been identified within the proposed project areas.

Operation. No impacts to vegetation are anticipated during operation of the GBI field.

Wildlife

Construction. Resident wildlife is limited to small rodents, bats, and songbirds. Little information is available on the effects of military activity on moose. When disturbed by civilian aircraft, they exhibit startle reactions and increase their walking speed. Sensitive periods are winter, and rutting and calving seasons. Young would be vulnerable to predators if adults are startled and temporarily leave them.

Brown/grizzly and black bears concentrate along Buchanan Creek, East Fork Little Delta River, and Delta Creek to Dinosaur Ridge, which are outside the area that could be affected by construction noise. The southern portion of West Training Area, a breeding and cub-rearing site, would not be affected by the proposed activities. Dall sheep in the southern portion of Fort Greely West Training Area are outside the area that could potentially be affected by construction noise and would also

not be affected by the proposed activities. Delta caribou have become habituated to a wide range of military disturbance. Most are located in the southern portion of West Training Area and would not be affected by proposed activities. There is a minimum disturbance period of mid February to early September for bison on the West Training Area. (U.S. Department of the Army, 1999—Alaska Army Lands Withdrawal Renewal Final Legislative EIS)

Noise rather than the sight of machines appears to cause disturbance to wildlife. Wildlife in the immediate area (moose, bison, caribou, lynx, and migrating and resident birds such as the olive-sided flycatcher, northern goshawk, and harlequin duck) could be startled by construction noise and possibly avoid or leave the area during construction. Despite additional similar habitat in the region, displaced wildlife may be lost. Vegetation removal during nesting seasons could also impact migratory or other nesting birds. Very little wildlife habitat remains in the proposed construction areas. Unique or sensitive wildlife habitat is to the west and southwest of the area proposed for use by the NMD program. The disturbance is not expected to alter migration patterns or wildlife corridors.

There are no designated anadromous streams near the proposed GBI site that would be impacted. Given the flat terrain and little rainfall in the region, runoff would not disturb any local water bodies.

Operation. Impacts from operation of the GBI would be similar to those discussed in section 4.3.1.2.1.1.

Threatened and Endangered Species

Construction. No Federal or state listed threatened or endangered species have been identified at Fort Greely. Protected bird species and the peregrine falcon, which was recently delisted but will continue to be monitored, migrate through the area during the spring and fall migration periods, and therefore could potentially be disturbed by construction-related noise. However, there have been no confirmed sightings within 16 kilometers (10 miles) of Fort Greely. (U.S. Department of the Army, 1997—Preliminary Draft EA for the Disposal and Reuse of Surplus Property at Fort Greely)

Operation. Impacts from operation of the GBI would be similar to those discussed in section 4.3.1.2.1.1.

Sensitive Habitat

Construction. No wetlands are located within the area proposed for use as part of the NMD program on Fort Greely. The nearest wetland is approximately 563 meters (1,848 feet) from the southeastern corner of the proposed site. This wetland consists of a palustrine shrub wetland

and was assessed as having a low value; no impacts to this wetland area would be anticipated to occur as part of the GBI deployment.

Operation. No impacts to sensitive habitat are anticipated during operation of the GBI field.

Cumulative Impacts

Cumulative impacts would include increased activity during construction and the loss of a small amount of habitat at the proposed site. Although the BMC2 element could be deployed within the same area as the GBI site, no additional cumulative impacts would be expected. Given the small amount of loss of wildlife habitat in the region of Fort Greely from past and current development, the small additional loss of habitat from the proposed NMD program would not result in a significant cumulative reduction in habitat. Cumulative effects from other proposed activities were considered minimal in the *EA to Construct Munitions Storage Facility Cold Regions Test Center, Bolio Lake* (U.S. Department of the Army, 1997) due to the small size of the projects when compared to the vast amount of undeveloped land in the area.

Mitigation Measures

No mitigation measures would be required.

4.3.1.2.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Biological Resources

The Yukon Training Area has been selected as a potential location for GBI deployment. Construction of a GBI field would require grading 243 hectares (600 acres).

Vegetation

Construction. The proposed GBI field would be located along the top of a low-lying hill that is relatively densely forested (Baxter, 1999—Comments received by EDAW, Inc., regarding the NMD Deployment Coordinating Draft DEIS). This area represents less than 1 percent of the total forested area on-base. No sensitive vegetation has been identified within the Yukon Training Area.

Operation. No impacts to vegetation are anticipated during operation of the GBI field.

Wildlife

Construction. Wildlife in the immediate area (moose, bears, lynx, and migrating and resident birds such as the olive-sided flycatcher, northern goshawk, and harlequin duck) could be startled by construction noise and

possibly avoid or leave the area during construction. Impacts would be the same as those discussed for Fort Greely. No anadromous fish streams are near the proposed GBI site.

Operation. Impacts from operation of the GBI would be similar to those discussed in section 4.3.1.2.1.1.

Threatened and Endangered Species

Construction. No Federal or state listed threatened or endangered species have been observed at the Yukon Training Area. However, the recently delisted peregrine falcon may travel through the area, and therefore could potentially be disturbed by construction-related noise. This unlikely disturbance would be short-term and is not expected to disrupt nesting or alter migration patterns.

Operation. Impacts from operation of the GBI would be similar to those discussed in section 4.3.1.2.1.1.

Sensitive Habitat

Construction. Construction activities could cause impacts to approximately 46 hectares (113 acres) of wetlands considered as having low value (U.S. Army Corps of Engineers, 1999—Wetland Delineation and Site Characterization for Military Sites, Alaska, Area 4—Fort Wainwright). The wetlands do, however, provide habitat for several state species of concern, such as the olive-sided flycatcher, gray-cheeked thrush, Townsend's warbler, and blackpoll warbler. Actual siting of the GBI could reduce the impacts by avoiding the wetlands. These wetlands could potentially be affected by the project through filling, draining, trenching, and other general construction activities. Because wetlands generally provide wildlife habitat, any significant changes to these wetlands would likely result in subsequent impacts on wildlife of the area.

Wetlands would be avoided to the extent practicable. Best Management Practices such as stabilizing fill slopes from erosion and the use of hay bales to filter sediment from storm water runoff would be implemented. Section 404 permits and state 401 water quality certification will be obtained if actual siting of the GBI field determines that wetlands would be affected and before any discharge of fill material (McConnell, 1999—Comments received by EDAW, Inc., regarding the NMD Deployment Coordinating Draft DEIS). The Alaska water quality certification would declare that any discharge would comply with applicable provisions of the Clean Water Act, including water quality standards. Compliance with the required wetlands permits would also work to minimize impacts. Maintenance of wetland quality and value would be coordinated with applicable agencies. The permitting process would entail review of

proposed activities and possible mitigations by all interested parties and applicable agencies.

Operation. No impacts to sensitive habitat are anticipated during operation of the GBI field.

Cumulative Impacts

Anticipated projects in the region combined with proposed NMD activities would result in cumulative impacts such as increased activity during construction and loss of habitat at the proposed site. Given the small amount of loss to wildlife habitat on the Yukon Training Area from past and current development, the small additional loss of habitat from the proposed NMD program would not result in a significant cumulative reduction in overall habitat. Although the BMC2 element could be deployed within the same area as the GBI site, no additional cumulative impacts would be expected. Filling in up to 46 hectares (113 acres) of wetlands at the Yukon Training Area would only contribute slightly to cumulative reduction of wetlands in the state, as addressed under Clear AFS.

Mitigation Measures

Mitigation measures would be similar to those described for Clear AFS.

4.3.1.2.2 North Dakota Installations

4.3.1.2.2.1 Grand Forks AFB—Biological Resources

Grand Forks AFB has been selected as a potential location for GBI deployment. Construction of a GBI field at the Weapons Storage Area would require grading 162 hectares (400 acres) of previously disturbed land, demolition of buildings, and construction of silos. Construction of the GBI field at OT-5 would also require grading 162 hectares (400 acres) of previously disturbed land and construction of silos, but would not require demolition of existing buildings.

Vegetation

Construction. Vegetation in the Weapons Storage Area is maintained by mowing. The OT-5 area is currently being used for alfalfa production. No sensitive vegetation has been identified as occurring in either location.

Operation. No impacts to vegetation are anticipated during operation of the GBI field.

Wildlife

Construction. Construction of a GBI at Grand Forks AFB would not substantially disturb or displace wildlife since terrestrial and aquatic habitat is very limited. The Weapons Storage Area is currently occupied and in use and does not provide high quality habitat for plants or wildlife. Wildlife that is in the area, however, may be temporarily disturbed by blasting and construction noise. Construction of a GBI field at the OT-5 site would remove habitat potentially used by small mammals and birds and would result in temporary noise-related impacts to those species. However, the area surrounding Grand Forks AFB is predominantly used for agriculture that would provide similar habitat for wildlife displaced from the Weapons Storage Area and OT-5 sites. No long-term effects to wildlife are anticipated.

Operation. Impacts from operation of the GBI would be similar to those discussed in section 4.3.1.2.1.1.

Threatened and Endangered Species

Construction. No threatened or endangered species have been identified at the locations that could be selected for use as part of the NMD program. Protected bird species listed in section 3.4.2.2 may migrate through the area, and therefore could potentially be disturbed by construction-related noise. However, this unlikely disturbance would be short-term and is not expected to alter migration patterns.

Operation. Impacts from operation of the GBI would be similar to those discussed in section 4.3.1.2.1.1.

Sensitive Habitat

Construction. Several small wetlands totaling approximately 5 hectares (12 acres) are located in the OT-5 site on Grand Forks AFB. Drainage next to the Weapons Storage Area goes into the 656-hectare (1,620-acre) Kelly's Slough, which could potentially be affected from any runoff due to project activities. These wetlands could potentially be affected by the project through filling, draining, trenching, and other general construction activities. Section 404 permits would be obtained if required after actual siting of the GBI field and before any discharge of fill material. Because wetlands generally provide wildlife habitat, any significant changes to these wetlands would likely result in subsequent impacts on wildlife of the area.

Wetlands would be avoided to the extent practicable. Best Management Practices such as stabilizing fill slopes from erosion and the use of hay bales to filter sediment from storm water runoff would be implemented. Section 404 permits will be obtained if actual siting of the GBI field determines that wetlands would be affected and before any discharge of

fill material. Compliance with the required wetlands permits would also work to minimize impacts. Maintenance of wetland quality and value would be coordinated with applicable agencies. The permitting process would entail review of proposed activities and possible mitigations by all interested parties and applicable agencies.

Operation. No impacts to sensitive habitat are anticipated during operation of the GBI field.

Cumulative Impacts

Cumulative impacts would include increased activity during construction and loss of habitat at the proposed site. Similar habitat in the region would minimize these impacts. Construction projects that have been planned for the base are not expected to contribute to cumulative impacts to biological resources. Additional similar habitat in the region would minimize these impacts. A general discussion of wetlands loss in the United States is provided in section 4.3.1.2.1.1. The vast majority of wetlands loss is due to agricultural conversion, which is the primary reason why as of 1990 approximately 50 percent of the wetlands in North Dakota had been lost. Only an estimated 40 to 50 percent of the original, prairie pothole wetlands in the Upper Midwest, including North Dakota, remain untouched (U.S. EPA, 1999—Prairie Potholes). The loss of wetlands in the state has contributed to increased flooding and water quality issues. An estimated 1 million hectares (2.5 million acres) of wetlands remain in North Dakota (Dahl, 1990—Wetlands Losses in the United States). Potential NMD element deployment sites in North Dakota are located at existing military facilities in areas that have experienced wetlands disturbance in the past. Filling in up to 5 hectares (12 acres) of wetlands at the OT-5 site would reduce the amount of wetlands on Grand Forks AFB by approximately 6 percent. However, construction on the base would contribute slightly to the cumulative reduction of wetlands in the region and state. Mitigation measures described below would minimize these potential cumulative impacts.

Although the BMC2 element could be deployed within the same area as the GBI site, no additional cumulative impacts would be expected.

Mitigation Measures

Mitigation measures would be similar to those described for Clear AFS.

4.3.1.2.2.2 Missile Site Radar—Biological Resources

The Missile Site Radar site has been selected as a potential location for GBI deployment. Construction of a GBI field would require grading 170 hectares (420 acres) of previously disturbed land.

Vegetation

Construction. The vegetation in this area is mainly human-influenced upland grassland that is maintained by mowing (figure 3.4-13). No sensitive vegetation has been identified as occurring at the site.

Operation. No impacts to vegetation are anticipated during operation of the GBI field.

Wildlife

Construction. Wildlife in the area may be temporarily disturbed by construction noise. Wildlife is limited to small mammals and birds due to fencing surrounding the installation. Additional grassland and thickets occur in the surrounding area that would provide habitat for any wildlife displaced by noise and human presence. No long-term impacts are anticipated.

Operation. Impacts from operation of the GBI would be similar to those discussed in section 4.3.1.2.1.1.

Threatened and Endangered Species

Construction. No Federal or state threatened or endangered species have been observed at the site. The bald eagle, peregrine falcon (recently delisted), and whooping crane could potentially be startled by construction noise if they fly through the area, but this would be a short-term effect that would not alter migration patterns.

Operation. Impacts from operation of the GBI would be similar to those discussed in section 4.3.1.2.1.1.

Sensitive Habitat

Construction. The natural wetlands on the Missile Site Radar associated with Roaring Nancy Creek are jurisdictional wetlands. An NPDES permit would be necessary for any runoff or discharge into Roaring Nancy Creek from activities. The waste stabilization ponds would not be removed and would still provide habitat for birds and small mammals not affected by the presence of fencing. Best Management Practices such as stabilizing fill slopes from erosion and the use of hay bales to filter sediment from storm water runoff would be implemented.

Operation. No impacts to sensitive habitat are anticipated during operation of the GBI field.

Cumulative Impacts

Cumulative impacts would include increased activity during construction and loss of habitat at the proposed site. The Missile Site Radar is currently inactive. The only project that could represent the potential for construction-related cumulative impacts would be the potential dismantlement and destruction of some of the facilities at this site. This activity would need to be mostly completed before the start of the main NMD construction activities. However, there is the potential that some construction activities may overlap. The destruction of these facilities would result in ground-disturbing activities and the resultant impacts from noise and human presence occurring over a longer period of time. As part of the standard construction procedures, Best Management Practices would be used to minimize potential impacts to wetlands. However, as addressed under Grand Forks AFB, there has been a significant reduction to wetlands in North Dakota. Potential impacts to wetlands would be mitigated as described below. Although the BMC2 element could be deployed within the same area as the GBI site, no additional cumulative impacts would be expected.

Mitigation Measures

Mitigation measures would be similar to those described for Clear AFS.

4.3.1.3 Cultural Resources

Potential impacts on cultural resources were assessed by (1) identifying types and possible activities that could directly or indirectly affect cultural resources, and (2) identifying the nature and potential significance of cultural resources in potentially affected areas. Potential impacts on historic properties occur through:

- Disturbance of an NRHP-listed, potentially eligible, or eligible prehistoric or historic archaeological site or traditional cultural property
- Modification of or visual intrusion upon an NRHP-listed, potentially eligible, or eligible historic buildings or structures
- Disturbance of a paleontological site

Pursuant to the NHPA, consultation as directed by the Section 106-review process has been initiated with the Alaska and North Dakota SHPOs. In addition, consultation was initiated with American Indian Tribes and Alaska Native Organizations (see section 5.0 for groups contacted). NMD activities will be conducted in accordance with the primary laws that pertain to the treatment of cultural resources including the NHPA (especially Sections 106 and 11O), the Archaeological Resources Protection Act, the Antiquities Act of 1906, the American Indian Religious Freedom Act, and NAGPRA.

4.3.1.3.1 Alaska Installations

4.3.1.3.1.1 Clear AFS—Cultural Resources

Prehistoric and Historic Archaeological Resources

Archaeological survey and predictive modeling for Clear AFS indicate that there are no recorded prehistoric or historic archaeological sites within the ROI and a low probability for these types of sites to occur. Based on the previous investigations, no further studies have been recommended for the area encompassed by the ROI; the SHPO has concurred (Northern Land Use Research, Inc., 1995—Cultural Resources Management Plan for Clear AS; Novak, 1998—Personal communication). As a result, proposed construction of the GBI or associated support facilities would have no effect on historic properties, and the SHPO has concurred (appendix D).

Historic Buildings and Structures

The only historic buildings and structures at Clear AFS are those associated with the Ballistic Missile Early Warning System and the White Alice Communications System. None of these properties are within the direct ROI for NMD; therefore, no effects are expected. New construction may occur near these properties, and visual intrusion

affecting their historic character had the potential to occur. As a result, designs of the new facilities were reviewed by the SHPO. Results of the review concurred with findings that no adverse effects would occur.

Native Populations/Traditional Resources

There have been no traditional cultural properties identified within the ROI or Alaska Native issues identified for the Clear AFS alternative. Consultation with the Tanana Chief's Conference and the Toghotthele Corporation has been initiated through the NEPA process, and no issues or concerns with the NMD program have been raised.

Paleontological Resources

Although paleontological resources are known to occur within the region, none have been identified within the boundary of Clear AFS; therefore, no effects are expected.

Cumulative Impacts

No other future programs that could contribute to cumulative cultural resources impacts have been identified at Clear AFS or within the region.

Mitigation Measures

Although no historic properties have been identified within the ROI, the cultural resources complexion of the installation and the region indicates that prehistoric and historic archaeological sites, traditional cultural properties, and/or paleontological sites do have the potential to occur. If during the course of NMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the Alaska SHPO will be notified through the Clear AFS environmental office. Subsequent actions will follow the guidance provided in 36 CFR 800.11 and NAGPRA.

4.3.1.3.1.2 Fort Greely—Cultural Resources

Prehistoric and Historic Archaeological Resources

Archaeological survey indicates that there are no known prehistoric or historic archaeological resources within the GBI ROI (Northern Land Use Research, Inc., 1999—Draft Cultural Resource Survey: Fort Greely and Yukon Training Area). The area is heavily disturbed from previous clearing and operational activities, and the likelihood of historic properties being present is low. SHPO concurrence is pending.

In 1997, a survey of the Fort Greely Cantonment was conducted. Due to the lack of subsurface artifacts, the entire cantonment, including the area around the runway, was cleared of cultural resource concerns.

Historic Buildings and Structures

A historic buildings and structures survey of Fort Greely was completed in 1998 by Charles M. Mobley and Associates. Review of the study by the Alaska SHPO and subsequent consultation between the Army and the SHPO indicates that there are 26 buildings and structures eligible for listing in the National Register (see section 3.5.1.4). Of these 26 historic properties, 20 (Buildings 503, 504, 601, 605, 608, 609, 610, 612, 615, 650, 652, 653, 655, 656, 659, 660, 661, 662, 663, 675) may require modification for the NMD program.

The Memorandum of Agreement between the Army and the Alaska SHPO regarding the 26 historic buildings stipulates that all of the properties "may be altered, demolished, leased with no restrictions, or transferred out of federal ownership with no restrictions" following completion of HABS Level 1 recordation. Because HABS documentation will be completed before any NMD modifications occur, there will be no adverse effects on these historic properties.

Native Populations/Traditional Resources

There have been no traditional cultural properties identified within the ROI or Alaska Native issues identified for the Fort Greely alternative. Consultation with the Tanana Chief's Conference has been initiated through the NEPA process, and no issues or concerns with the NMD program have been raised.

Paleontological Resources

Paleontological remains have been recorded within the Fort Greely area; however, none have been identified within the ROI. Given the topography of the site and the types of locations within which paleontological resources typically occur, the likelihood for them to be encountered during the course of NMD activities is very low. Therefore, no effects are expected.

Cumulative Impacts

Future projects have been identified for Fort Greely that involve construction of new facilities or infrastructure. In addition, there is the potential reuse of base facilities in the cantonment area. None of these projects would occur in the vicinity of the NMD ROI (GBI and BMC2); therefore, no cumulative impacts are expected.

Mitigation Measures

Archaeological survey indicates that there are no historic properties within the Fort Greely GBI ROI. SHPO concurrence is pending. Although there have been no historic properties identified within the ROI, the

cultural resources complexion of the installation and the region indicates that prehistoric and historic archaeological sites, traditional cultural properties, and/or paleontological sites do have the potential to occur. If during the course of NMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the Alaska SHPO will be notified through the Fort Wainwright environmental office. Subsequent actions will follow the guidance provided in 36 CFR 800.11 and NAGPRA. Concurrence on the draft historic buildings and structure survey is pending.

4.3.1.3.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Cultural Resources

Prehistoric and Historic Archaeological Resources

Yukon Training Area. Archaeological survey indicates that there are no prehistoric or historic resources within the GBI ROI (Northern Land Use Research, Inc., 1999—Cultural Resource Survey: Fort Greely and Yukon Training Area). SHPO concurrence is pending.

Site FAI 157 is located approximately 262 meters (860 feet) west of the westernmost boundary of the ROI. Previous recommendations regarding this site (Holmes, 1979—Report of Archaeological Reconnaissance) indicate that if future activities in the area pose a potential threat to the site, additional studies should be undertaken. If avoidance of this site is not feasible during the conduct of NMD activities, adverse effects could be reduced to non-adverse levels through the application of the mitigation measures described below.

Eielson AFB. Prehistoric and historic archaeological survey of Eielson AFB is complete. No prehistoric and historic archaeological properties have been identified. No additional studies have been recommended (Northern Land Use Research, Inc., 1994—Predictive Model for Discovery of Cultural Resources on Eielson AFB). As a result, NMD activities are expected to have no effect on historic properties, and the SHPO has concurred (appendix D).

Historic Buildings and Structures

Yukon Training Area. With the exception of several small, recent use structures (Northern Land Use Research, Inc., 1999—Cultural Resource Survey: Fort Greely and Yukon Training Area), none of which are considered to have the qualities that would make them eligible for the NRHP, the Winter Camp ROI is devoid of any standing buildings or structures; therefore, no effects on historic properties would occur.

Eielson AFB. Several buildings and structures at Eielson AFB that may be potentially eligible for listing in the NRHP have been identified. Of these, only one (Building 3425, a warehouse) would be affected by

modifications from the NMD program. Because the nature of the modifications is still unspecified, potential effects could occur; however, any potential adverse effects could be reduced to non-adverse levels through the application of the mitigation measures described below.

Native Populations/Traditional Resources

There have been no traditional cultural properties identified within the ROI or Alaska Native issues identified for the Winter Camp—Yukon Training Area/Eielson AFB alternative. Consultation with the Tanana Chief's Conference has been initiated through the NEPA process, and no issues or concerns with the NMD program have been raised.

Paleontological Resources

Yukon Training Area. Although paleontological resources have been recorded from the adjacent lands of Eielson AFB, none have been identified within the Yukon Training Area or the Winter Camp site. Paleontological remains within this area would most likely be encountered buried in creek bottoms (U.S. Department of the Interior and the U.S. Department of Defense, 1994—Fort Greely Proposed Management Plan Final EIS). As the Winter Camp site is elevated and contains no creeks, the likelihood of encountering paleontological remains is quite low; therefore, no effects are expected.

Eielson AFB. Several paleontological sites have been recorded within the boundary of Eielson AFB; most have been located in pits during gravel quarrying. Given the nature of construction at Eielson AFB (i.e., construction frequently requires gravel quarrying for roads/foundations), there is some potential for paleontological remains to be encountered. Mitigation measures for unexpected discoveries are provided below.

Cumulative Impacts

Yukon Training Area. Three future projects have been identified within the Yukon Training Area (see section 2.6); however, they are not located near the ROI; therefore, no cumulative effects are expected.

Eielson AFB. A number of future projects have been proposed for Eielson AFB between 1999 and 2003 (see section 2.6). With the exception of some runway and facility modifications, most of the projects are new construction. No prehistoric and historic archaeological resources or traditional cultural properties have been identified at the installation, and only one potentially historic building (Building 3425, a warehouse) has been identified within the ROI. As a result, no cumulative effects on historic properties are expected as a result of NMD activities.

Mitigation Measures

Yukon Training Area. Archaeological survey indicates that there are no historic properties within the ROI; therefore, no mitigation measures are required. SHPO concurrence is pending.

Site FAI 157 falls just outside the westernmost boundary of the Winter Camp ROI, but is close enough to the ROI that it could be affected by NMD construction or operational activities. If Site FAI 157 cannot be avoided during the planning and operations for the NMD program, mitigation may be required to reduce potential adverse effects to non-adverse levels. Appropriate mitigation measures will be developed in consultation with the Alaska SHPO and will be conducted in accordance with 36 CFR 800. Standard mitigation measures include data recovery using appropriate archaeological practices.

Although there have been no historic properties identified within the ROI, the cultural resources complexion of the installation and the region indicates that prehistoric and historic archaeological sites, traditional cultural properties, and/or paleontological sites do have the potential to occur. If during the course of NMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the Alaska SHPO will be notified through the Fort Wainwright environmental office. Subsequent actions will follow the guidance provided in 36 CFR 800.11 and NAGPRA.

Eielson AFB. Because Eielson AFB has been found to be devoid of prehistoric and historic archaeological resources and traditional cultural properties, no mitigation measures are required. However, the cultural resources complexion of the region indicates that prehistoric and historic archaeological sites, traditional cultural properties, and/or paleontological sites do have the potential to occur. If during the course of NMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the Alaska SHPO will be notified through the Eielson AFB environmental office. Subsequent actions will follow the guidance provided in 36 CFR 800.11 and NAGPRA.

Potential effects on Building 3425 may require mitigation to reduce adverse effects to non-adverse levels. Appropriate mitigation measures will be developed in consultation with the Alaska SHPO and will be conducted in accordance with 36 CFR 800. Standard mitigation measures for adverse effects on historic buildings and structures include recordation. Recordation can be accomplished in a number of ways, among them documentation using the guidance provided by the HABS/HAER division of the National Park Service.

4.3.1.3.2 North Dakota Installations

4.3.1.3.2.1 Grand Forks AFB—Cultural Resources

Prehistoric and Historic Archaeological Resources

Grand Forks AFB has two potential locations for the GBI element: the Weapons Storage Area and OT-5. Grand Forks AFB has completed archaeological surveys and inventories that satisfy the requirements of section 110 of the NHPA. There are no NRHP-listed or -eligible prehistoric or historic archaeological sites or archaeologically sensitive areas within the ROI for either of the two potential locations for the GBI element at Grand Forks AFB (Grand Forks AFB, 1997—Cultural Resources Management Plan). Therefore, no effects on archaeological resources are expected to occur from construction activities associated with the GBI element at Grand Forks AFB.

Historic Buildings and Structures

Facilities at Grand Forks AFB requiring modification for either of the two potential locations of the GBI include Buildings 707, 739, 740, 741, 742, 312, 313, and 318.

Grand Forks AFB has conducted an inventory of Cold War properties, which concluded that only one structure, Building 714, was potentially eligible for inclusion in the NRHP. However, discussion with the SHPO continues on all Cold War facilities (including those listed above) in light of emerging Air Force guidance and increased DOD personnel and SHPO cognizance. NMD program requirements on Grand Forks AFB proper would have no anticipated effect on Building 714 or any of the buildings requiring modification (707, 739, 740, 741, 742, 312, 313, and 318). Therefore, no effects on historic buildings and structures are expected to occur from construction activities associated with the GBI element at Grand Forks AFB. However, given the continuing consultation between Grand Forks AFB and the SHPO regarding Cold War facilities, prior to any building modification the NMD program would coordinate with the Grand Forks AFB environmental management to verify the NRHP status. If buildings requiring modification are eligible for the NRHP, the NMD program would consult with the SHPO to minimize impacts.

Native Populations/Traditional Resources

There have been no traditional cultural properties identified within the ROI or North Dakota Native issues identified for this location. Consultation with the affected Native American Groups has been initiated through the NEPA process (see section 5.0, Consultation and Coordination), and no issues or concerns with the NMD program have been raised.

Paleontological Resources

There are no recorded fossils or National Natural Landmarks within the vicinity of Grand Forks AFB or any other ground-disturbing areas within the cultural resources ROI; therefore, no effects are expected.

Cumulative Impacts

No cumulative cultural resources impacts are expected to occur as a result of the restoration efforts associated with the 1997 flood or the anticipated construction projects at Grand Forks AFB.

Mitigation Measures

Because no NRHP-listed or -eligible prehistoric or historic archaeological sites or archaeological or traditional resources have been identified within the ROI for Grand Forks AFB, no mitigation measures have been identified. However, if during the course of NMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the North Dakota SHPO will be notified through the Grand Forks AFB environmental office. Subsequent actions will follow the guidance provided in 36 CFR 800.11 and NAGPRA.

The NMD program will continue to coordinate with base personnel and the North Dakota SHPO regarding the status of Cold War facilities on Grand Forks AFB. If any building requiring modification is eligible for the NRHP, appropriate mitigation measures will be developed in consultation with the North Dakota SHPO and will be conducted in accordance with 36 CFR 800. Standard mitigation measures for adverse effects on historic buildings and structures include recordation. Recordation can be accomplished in a number of ways, including documentation using the guidance provided by the HABS/HAER division of the National Park Service.

4.3.1.3.2.2 Missile Site Radar—Cultural Resources

Prehistoric and Historic Archaeological Resources

No NRHP-listed or -eligible prehistoric or historic archaeological sites or sensitive areas have been identified within the ROI. Therefore, no effects on archaeological resources are expected to occur as a result of construction activities.

Historic Buildings and Structures

Existing facilities at the Missile Site Radar requiring modification for the installation of ground-based interceptors at the Missile Site Radar include Buildings 346, 350, 340, 301, 385, and 902. None of these facilities are eligible for listing in the NRHP. Facility 301 is scheduled for removal

in 1999. In addition to these modifications, the GBI itself and numerous support facilities would be constructed onsite.

Native Populations/Traditional Resources

There have been no traditional cultural properties identified within the ROI or North Dakota Native issues identified for this location. Consultation with the affected Native American Groups has been initiated through the NEPA process, and no issues or concerns with the NMD program have been raised (see section 5.0, Consultation and Coordination).

Paleontological Resources

There are no recorded fossils or National Natural Landmarks within the vicinity of the Missile Site Radar or any other ground-disturbing areas within the Cultural Resources ROI; therefore, no effects are expected.

Cumulative Impacts

The Missile Site Radar is currently inactive. The only other project that could represent the potential for cumulative impacts could be the potential dismantlement and destruction of some of the facilities at the Missile Site Radar. This activity would need to be mostly completed before the start of the main NMD construction activities. Both the radar and the silos at the Missile Site Radar are eligible for the NRHP. However, these facilities have been documented in an HAER, and before the onset of any activities, appropriate consultation would occur with the North Dakota SHPO. Since all of the NRHP eligible facilities at the Missile Site Radar have been documented, no cumulative impacts would occur. No other projects have been identified that would result in the potential for cumulative impacts.

Mitigation Measures

Because no NRHP-listed or -eligible prehistoric or historic archaeological sites or archaeological or traditional resources have been identified within the ROI for the Missile Site Radar, no mitigation measures have been identified. However, if during the course of NMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the North Dakota SHPO will be notified through the U.S. Army Space and Missile Defense Command environmental office. Subsequent actions will follow the guidance provided in 36 CFR 800.11 and NAGPRA. All SRMSC properties have been documented in an HAER and accepted and approved by the National Park Service.

4.3.1.4 Geology and Soils

This section addresses potential impacts and hazards related to geology and soils in the project area. Project activities evaluated in this section primarily are those related to construction, such as grading, cut/fill, and short- and long-term earth stabilization measures. The potential for occurrence of geologic hazards such as major seismic events is also evaluated. Potential geology and soil impacts were evaluated on the following:

- Substantial erosion or siltation from water and wind
- Damage to large areas of permafrost (Alaska)
- Exposure of people and structures to major geologic hazards

4.3.1.4.1 Alaska Installations

4.3.1.4.1.1 Clear AFS—Geology and Soils

Construction of a new GBI and support facilities would require disturbing approximately 243 hectares (600 acres) for grubbing and grading for site preparation. In addition, there would be a small amount of disturbance associated with the construction of dormitories near the existing dormitory area and some administrative facilities in the Camp Area of the base. The main issue during construction is associated with soil erosion from the site. However, at Clear AFS the soils are predominately well drained sands and gravels overlaid with a thin layer of silt, surface relief is relatively flat, and the area receives minimal precipitation (33 centimeters [13 inches]) and light winds; therefore, minimal soil erosion to adjacent areas would be expected. Best Management Practices would be used to reduce the potential for soil erosion at the GBI site. These measures could include limiting the amount of area exposed, creating sediment basins to control flow, and adding protective covering to the slopes. Once construction is complete and vegetation is replaced, there should be little soil erosion from operation of the site.

Because of the well drained nature of the area soils, the presence of thaw unstable permafrost is not anticipated to be a problem. However, before design and construction, a comprehensive geotechnical investigation would be conducted to determine the exact nature of the soils in the area. In the unlikely event that thaw unstable permafrost were encountered during these investigations, the site layout would be adjusted to minimize any impacts to these areas. These investigations would also determine the depth to groundwater. Depending on the depth, missile silos may be slightly elevated to avoid de-watering during construction and operations.

Construction on Clear AFS would not impact any mineral resources on the base. There is the potential for use of local sand and gravel resources in the area as part of the construction process, but this use should not deplete the available resources in the area. Purchase of state-owned gravel would be under a materials sale contract.

Clear AFS lies in seismic zone 3, where major earthquake damage and peak ground accelerations ranging from 0.2 to 0.3g have a 10 percent probability of occurring at least once in 50 years. Construction of new facilities would incorporate earthquake-resistant designs to reduce the potential of significant impacts occurring from a seismic event, including surface rupture.

Cumulative Impacts

No cumulative impacts are anticipated as a result of current ongoing mission activities, nor the concurrent construction and operation of the new phased array radar that is replacing the Ballistic Missile Early Warning System. Because the deployment of another potential NMD element at Clear AFS, BMC2, would occur within the 243-hectare (600-acre) GBI site, impacts would be similar to those described above. Once vegetation is in place, no long-term cumulative impacts to soils would be expected from erosion at the site. Overall, no cumulative impacts are expected from construction and operation at Clear AFS.

Mitigation Measures

Mitigation measures for permafrost areas require a detailed understanding of the type and extent of permafrost present. Where possible, the preferred method is to avoid permafrost areas. A detailed geotechnical site investigation would be required to define the subsurface soil and groundwater conditions and permafrost areas, as well as development of foundation design parameters for soil-structure interaction in a highly seismic area. A detailed facility layout would be required to optimize the configuration of system elements while minimizing potential deleterious impacts to identified critical soil, vegetation, and permafrost areas.

4.3.1.4.1.2 Fort Greely—Geology and Soils

Construction of a new GBI, access roads, and support facilities would require disturbing approximately 243 hectares (600 acres) for grubbing and grading for site preparation. In addition, there would be a small amount of disturbance associated with the resurfacing of the existing runway. The main issue during construction is associated with soil erosion from the site. However, at Fort Greely the soils are predominately well drained sands and gravels overlaid with a thin layer of silt, surface relief is relatively flat, and the area receives minimal precipitation (33 centimeters [13 inches]) and light winds; therefore,

minimal soil erosion to adjacent areas would be expected. Best Management Practices would be used to reduce the potential for soil erosion. These measures could include limiting the amount of area exposed, creating sediment basins to control flow, and adding protective covering to the slopes. Once construction is complete and vegetation is replaced, there should be little soil erosion from operation of the site.

Geotechnical studies conducted at the potential GBI site in 1999 did not discover any ice lenses or other permafrost features; therefore, no impacts to permafrost would be expected.

The potential GBI site is near historic sources of sand and gravel and placer gold along Jarvis Creek. Assuming the lands remain closed to mineral location, leasing, and sales, there would be no impact on the mineral resource except for local extraction to support NMD construction; however, this should not deplete the available resources in the area. Purchase of state-owned gravel would be under a materials sale contract. Potential impacts from seismic events would be the same as described for Clear AFS.

Cumulative Impacts

No cumulative impacts are anticipated as a result of current ongoing training range activities, planned closure of the Fort Greely cantonment area, or the construction of a new power line from the Richardson Highway to the Alascom Microwave Site in conjunction with GBI deployment. As noted under the No-action Alternative, some cumulative impacts to soils have been noted from ongoing training activities at Fort Greely. Because the training activities would not occur within the same area as the GBI deployment site, no additional cumulative impacts would result. In addition, construction for NMD would include measures to reduce soil erosion on the site and to limit the extent of the erosion. Potential reuse of the cantonment area would not result in significant new construction or ground-disturbing activities and, therefore, should not result in cumulative impacts. Because the deployment of another potential NMD element at Fort Greely, BMC2, would occur within the GBI site, impacts would be similar to those described above. Once site vegetation is restored, no long-term cumulative impacts to soils would be expected from erosion at the site. Overall, no cumulative impacts are expected from construction and operation at Fort Greely.

Mitigation Measures

Mitigation measures to minimize potential impacts resulting from soil erosion are similar to those described for Clear AFS.

4.3.1.4.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Geology and Soils

Moderate impact is anticipated to the geology and soils at Yukon Training Area/Eielson AFB as a result of the Proposed Action. Construction of the GBI and support facilities would require disturbing approximately 243 hectares (600 acres) at the GBI site for grubbing and grading preparation. The relatively thick mantle of silt at the site is characterized as having moderate to very severe susceptibility to erosion, especially on steeper slopes. Best Management Practices would be used to reduce the potential for soil erosion at the GBI site. Once construction is complete and vegetation is replaced, there should be little soil erosion from operation of the site.

Yukon Training Area and Eielson AFB are within a region of discontinuous permafrost. Preliminary geotechnical investigations at the proposed site indicate the presence of permafrost on north-facing slopes, which is typical for areas of discontinuous permafrost. The thawing of permafrost in this area could result in subsidence, erosion, and gully formation. The thawing process could also affect water quality by increasing suspended sediment values if soil moved toward water bodies. To minimize impacts to permafrost, site design would try to avoid construction in permafrost areas.

Construction on the Yukon Training Area/Eielson AFB would not impact any mineral resources on the bases. There is the potential for use of local sand and gravel resources in the area as part of the construction process; however, this should not deplete the available resources in the area. Purchase of state-owned gravel would be under a materials sale contract. Potential impacts from seismic events would be the same as described for Clear AFS.

Cumulative Impacts

No cumulative impacts are anticipated as a result of current ongoing training range activities nor anticipated new construction planned at the Yukon Training Area in conjunction with the Proposed Action. As noted under the No-action Alternative, some cumulative impacts to soils have been noted from ongoing training activities at the Yukon Training Area. Because the training activities would not occur within the same area as the GBI deployment site, no additional cumulative impacts would result. In addition, construction for NMD would include measures to reduce soil erosion on the site and limit the extent of the erosion. No cumulative impacts are anticipated resulting from the wide variety of new construction planned for the cantonment area at Eielson AFB. Because the deployment of another potential NMD element at the Yukon Training Area, BMC2, would occur within the 243-hectare (600-acre) GBI site, impacts would be similar to those described above. Once site vegetation

is restored, no long-term cumulative impacts to soils would be expected from erosion at the site. Overall, no cumulative impacts are expected from construction and operation at this location.

Mitigation Measures

Best Management Practices would be used to reduce the potential for short-term soil erosion during construction. Various measures may be recommended to reduce water erosion of slopes, partially graded streets, and pads. Alternative recommendations may include minimizing the amount of area exposed during grubbing; use of soil stabilizers to reduce fugitive dust; use of sandbags for diverting flow; creating sediment basins to control flow; adding protective covering to slopes, such as mulch, straw, plastic netting, or some combination thereof to reduce gullying; and revegetating slopes and open areas as soon as possible to enhance long-term stability. Potential mitigation measures for permafrost would be similar to that described for Clear AFS.

4.3.1.4.2 North Dakota Installations

4.3.1.4.2.1 Grand Forks AFB—Geology and Soils

Construction of the GBI and support facilities would require disturbing approximately 162 hectares (400 acres) in one of two potential locations, each of which has been previously disturbed. Soils at Grand Forks AFB are generally fine to medium grained, with little surface relief and generally suitable for cultivation. The primary soil management issue is short-term wind erosion during ground-disturbing activities. Over the 2-year ground-disturbing period, Best Management Practices to minimize fugitive dust would be implemented. Once construction is complete and vegetation is replaced, there should be little soil erosion from operation of the site.

Construction on Grand Forks AFB would not impact any mineral resources on the base. There is the potential for use of local sand and gravel resources in the area as part of the construction process; however, this should not deplete the available resources in the area.

Cumulative Impacts

No cumulative impacts are anticipated as a result of current and planned construction activities at Grand Forks AFB. Because the deployment of another potential NMD element at Grand Forks AFB, BMC2, would only require the potential for an additional 1 hectare (2 acres), no cumulative geology and soils impacts would be expected. In addition, once site vegetation is restored, no long-term erosion impacts would be expected.

Mitigation Measures

Best Management Practices would be used to reduce the potential for soil erosion during construction. Various measures may be recommended to reduce erosion of slopes, partially graded streets, and pads. Alternative recommendations may include minimizing the amount of area exposed during clearing; frequent watering of graded areas; use of soil stabilizers; and revegetation of slopes and open areas as soon as possible to enhance long-term stability.

4.3.1.4.2.2 Missile Site Radar—Geology and Soils

Construction of a new GBI and support facilities would require disturbing approximately 170 hectares (420 acres) of previously disturbed area over a 2-year ground-disturbing period. Site soils are susceptible to short-term wind and water erosion during construction. Over the 2-year ground-disturbing period, Best Management Practices to minimize soil erosion would be implemented. Once construction is complete and vegetation is replaced, there should be little soil erosion from operation of the site.

Construction on the Missile Site Radar would not impact any mineral resources on the base. There is the potential for use of local sand and gravel resources in the area as part of the construction process; however, this should not deplete the available resources in the area.

Cumulative Impacts

The Missile Site Radar is currently inactive. The only other project that could represent the potential for cumulative construction-related impacts could be the potential dismantlement and destruction of some of the facilities at the Missile Site Radar. This activity would need to be mostly completed before the start of the main NMD GBI and BMC2 activities. The destruction of these facilities would result in ground-disturbing activities occurring over a longer period of time. Soils at the site are susceptible to short-term wind and water erosion; therefore, cumulative construction-related impacts would result in some soil loss. As part of the standard construction procedures, Best Management Practices would be used to minimize potential soil erosion.

Deployment of the BMC2 NMD element would occur within the 170-hectare (420-acre) GBI site, impacts would be similar to those described above, and no cumulative impacts would occur. In addition, once site vegetation is restored, no long-term erosion impacts would be expected.

Mitigation Measures

Mitigation measures are similar to those described for Grand Forks AFB.

4.3.1.5 Hazardous Materials and Hazardous Waste Management

This section addresses potential environmental impacts that could result from the storage and use of hazardous materials and the generation and disposal of hazardous wastes associated with construction and operation of the GBI element at alternative sites. The siting of these facilities at some locations could affect identified IRP sites that are currently involved in remedial investigations or actions.

Federal and state regulatory standards and guidelines have been applied in determining the potential impacts associated with the use of hazardous materials and the generation of hazardous waste. The following criteria were used to identify potential impacts:

- Amount of hazardous materials brought onto the installations to support the GBI NMD program that could result in exposure to the environment or public through release or disposal practices
- Hazardous waste generation that could increase regulatory requirements
- Pollution prevention practices to be utilized during the NMD program to prevent and/or improve environmental impacts associated with operations
- Program activities that would affect IRP activities
- Accidental release of friable asbestos, lead-based paint, or PCBs during the demolition or modification of a structure
- Construction of facilities in areas where radon levels exceed U.S. EPA recommendations
- Use of pesticides that are not consistent with existing installation practices

Potential public health-related issues associated with liquid and solid propellants are addressed under section 4.3.1.6, Health and Safety.

Construction Overview

Construction activities would be centralized to the greatest extent possible and would occur at the selected project site and on specified construction laydown areas and access roads. Temporary storage tanks and other facilities for the storage of hazardous materials would be located in protected and controlled areas designed to comply with site-specific spill prevention and countermeasure plans.

Hazardous wastes generated during construction would consist of materials such as motor fuels, waste oils, hydraulic fluids, cleaning fluids, cutting fluids, and waste antifreeze. These hazardous materials would be

containerized and properly disposed of by the individual contractors. Table 4.3.1.5-1 summarizes estimated quantities of hazardous materials and wastes that would be used and generated during the construction phase of GBI deployment at alternative locations.

Table 4.3.1.5-1: Hazardous Materials and Wastes—Construction Activities

Source	Hazardous Material	Estimated Annual Usage kilograms (pounds)	Estimated Annual Wastes kilograms (pounds)
Construction equipment	Diesel fuel, gasoline, lubricants, oils, hydraulic fluids, antifreeze	100,000 (220,462)	100 (220.5)
Construction vehicles	Diesel fuel, gasoline, lubricants, oils, solvents	100,000 (220,462)	100 (220.5)
Contractor portable offices and personnel support facilities	Heating fuel, cleaning solvents	5,000 (11,023)	10 (22)
Paints, coatings and solvents	Paints, paint thinner	5,000 (11,023)	10 (22)
Portable electric generators	Diesel fuel, oil, lubricants	1,000 (2,204)	5 (11)
Storage batteries	Battery acid	100 (220.5)	1 (2.2)
Cloth rags, paper products	Oil, solvents	100 (220.5)	1 (2.2)

Any spill of a hazardous material or hazardous waste that may occur during construction would be quickly remediated in accordance with the contractor's SWPPP and Project Spill Prevention, Control, and Countermeasure Plan that would be developed for each site. All hazardous materials used and hazardous waste generated during construction would be handled in accordance with applicable Federal, state, and local regulations.

Operations Overview

Hazardous Materials Management. Under the Proposed Action, regular maintenance and operation activities at the GBI deployment site would involve a continuous but relatively low level of activity requiring the use of hazardous materials. Since major missile maintenance activities would take place at an offsite Integration Facility, there would be minimal use of hazardous materials at the deployment site. The anticipated amounts of hazardous materials used at the deployment site are not known;

however, these hazardous materials could include protective coatings, lubricants and oils, motor and generator fuels, isopropyl alcohol, backup power batteries, adhesives, and sealants. These materials would be used in the periodic inspection and preventative maintenance to interceptor support systems, such as power supplies, environmental control systems, communication systems, and security systems. These hazardous materials would be stored in a centralized location for distribution when needed for maintenance. Material Safety Data Sheets would be posted at all locations where hazardous materials are stored or used.

A site-specific hazardous materials management plan and spill prevention, control, and countermeasures program would be developed for the deployment site. An overall Pollution Prevention Plan is in the process of being developed for the NMD program. The use and storage of hazardous materials would be accordance with Federal, state, and local regulations.

The only other hazardous materials at the GBI deployment site would be the nitrogen tetroxide and hydrazine inside of each exoatmospheric kill vehicle of each GBI within the silo (7 kilograms [15 pounds] or 8 liters [2 gallons] of hydrazine and 8 kilograms [18 pounds] or 6 liters [1.5 gallons] of nitrogen tetroxide). These liquid propellants would be loaded within the exoatmospheric kill vehicle at the offsite Integration Facility before arriving at the deployment site. No storage or fueling of the liquid propellant would occur at the deployment site. The hydrazine, which is included in the U.S. EPA's Extremely Hazardous Substance List, would be reported to local authorities in accordance with the EPCRA. Both hydrazine and nitrogen tetroxide are reported in U.S. EPA's Toxic Substances Control Act Inventory.

The transportation of the liquid propellants would be in accordance with Department of Transportation regulations. In addition, emergency response personnel and equipment would accompany the GBI during transport to handle and contain hazardous materials in the unlikely event of a accident and spill during transportation. The hazardous materials generated during an accidental leak during transportation would be disposed of in accordance with Federal, state, and local regulations. See section 4.3.1.6, Health and Safety, for potential public health-related issues associated with liquid propellants.

Hazardous Waste Management. As discussed above, there would be minimal use of hazardous materials at the GBI deployment site. Any hazardous waste generated from the use of these materials would be handled in accordance with appropriate Federal, state, and local regulations. Hazardous waste generated would be temporarily stored onsite before transfer to the host installation's main hazardous waste storage facility for appropriate disposal. The appropriate hazardous waste management plan would be developed for the site.

Pollution Prevention. A stated objective of the NMD program is to seek opportunities to eliminate or minimize use of hazardous materials throughout the life cycle of the program. The NMD program is in the process of developing a Pollution Prevention Plan that outlines strategies to minimize the use of hazardous materials, including Class II ODSs and EPCRA 13 chemicals. This plan will be applied throughout the design of all NMD elements, incorporating trade studies and emphasizing reduction of hazardous materials to be used on government installations.

Installation Restoration Program. The DOD will continue to remediate all contamination associated with sites proposed for use under the NMD program. Delays or restrictions on facility use for NMD deployment areas may occur depending on the extent of contamination and remedial actions determined for contaminated sites. Prior to construction, the NMD program would coordinate with the appropriate base personnel regarding existing site contamination. If a site may be affected, the appropriate state and Federal agencies would be consulted.

Asbestos. No asbestos would be used in the construction of new facilities for the NMD program. Prior to any existing building modifications for deployment, it would be determined if asbestos-containing material exists in the modification area. If asbestos exists, it would be removed before modification in accordance with appropriate Federal, state, and local regulations by certified personnel.

Polychlorinated Biphenyls. No PCBs would be used in the construction of new facilities for the NMD program. Prior to any existing building modifications for deployment, it would be determined if PCBs exist in the modification area. If PCBs exist, they would be removed before modification in accordance with appropriate Federal, state, and local regulations.

Lead-based Paint. No lead-based paint would be used in the construction of new facilities for the NMD program. Prior to any existing building modifications for deployment, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed before modification in accordance with appropriate Federal, state, and local regulations.

Radon. In areas where existing radon surveys have been found to exceed U.S. EPA recommendations, appropriate design techniques would be utilized for occupied facilities to ensure exposure levels would not exceed recommended levels.

Pesticides. During GBI operational maintenance, pesticides may be needed within the GBI missile field. The use of pesticides would be in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act.

Local installation personnel would be contacted for appropriate materials that should be used for the region.

4.3.1.5.1 Alaska Installations

If the Proposed Action includes the siting of the GBI element in Alaska, there may be a potential for hazardous materials and hazardous wastes impacts during construction, operation, and maintenance activities. Geotechnical challenges in the Arctic present special construction and operation requirements because of permafrost. All facilities and utilities, including those for the storage, handling, use, and disposal of hazardous materials and wastes would need to be designed to protect and maintain these arctic resources.

4.3.1.5.1.1 Clear AFS—Hazardous Materials and Hazardous Waste Management

Construction

GBI deployment would require the construction of GBI silos, operational support facilities, and personnel support facilities. The expected hazardous materials and wastes would be similar to those discussed in section 4.3.1.5.

As discussed above, appropriate plans and measures would be implemented during the construction program to minimize hazardous materials and hazardous waste impacts that may result from NMD construction activities. Overall, hazardous materials and hazardous waste management activities are addressed below under Operation.

Operation

Hazardous Materials Management. The types of hazardous materials proposed for use under the Proposed Action would be similar to those currently used at Clear AFS, except for the liquid propellants inside the exoatmospheric kill vehicle as part of the GBI.

Implementation of the Proposed Action would increase the amounts of hazardous materials used on Clear AFS; however, given that the majority of GBI maintenance functions would not occur at Clear AFS, the increase would be minor. The hazardous materials for the NMD program would be obtained through the Clear AFS HAZMART, which has the mechanisms in place to store and manage the increased quantity of hazardous materials. The only new material proposed for use at Clear AFS would be the liquid propellants. As mentioned previously, this material would not be stored onsite, but would be contained within the GBI. These materials would be incorporated into the station's Spill Prevention and Response Plan, which includes both a Spill Prevention and Countermeasures Plan and an Oil and Hazardous Substances Pollution Prevention Plan. In addition, the liquid

propellants would be reported to local authorities in accordance with the EPCRA, as required. Overall, all hazardous materials management activities would be in accordance with existing regulations for the use and storage of hazardous materials at Clear AFS for the NMD program. Transportation of the liquid propellants is addressed in the general discussion of GBI deployment.

Any underground or aboveground storage tanks within the proposed NMD construction area would be removed before construction activities in accordance with appropriate Federal, state, and local regulations. The storage tanks proposed for the NMD program would contain fuel for the electrical generators required for the NMD system. The exact number and type of storage tanks are currently not known; however, all storage tanks installed as part of the NMD program would comply with appropriate state and Federal regulations.

Hazardous Waste Management. The types of hazardous waste generated under the Proposed Action would be similar to the waste generated by current Clear AFS activities. Under the NMD program, there would be a minor increase in hazardous waste generated at Clear AFS, since most of the maintenance activities associated with GBI deployment would occur at the manufacturing site, not at the deployment base.

Clear AFS has the mechanisms in place to store, manage, and dispose of hazardous waste, including any additional propellant waste that could be generated if a leak within the exoatmospheric kill vehicle should occur. If a leak were to occur, all hazardous waste would be handled in accordance with appropriate regulations. In addition, there would be the appropriate spill containment team with training in the handling of the liquid propellants with the necessary equipment to manage any leak of the liquid propellants at the GBI deployment base. All hazardous waste generated at the GBI deployment site would be handled through the base's treatment, storage, and disposal facility. This facility has adequate capacity to handle the additional hazardous waste generated by the NMD program.

Pollution Prevention. Under the Proposed Action, the NMD GBI activities at Clear AFS would utilize the existing HAZMART at the station. This program controls and reduces the use of hazardous materials on the installation. In addition, the NMD program would comply, as required, with the current base Pollution Prevention Management Plan. As stated above, the NMD program has generated and will continue to update the system-wide Pollution Prevention Plan that outlines strategies to minimize the use of hazardous materials over the lifecycle of the NMD program.

Installation Restoration Program. IRP investigations at Clear AFS since 1991 have identified 23 sites of potential contamination. Of these sites, 22 are considered closed sites, pending state written approval. Eleven of

these sites are located on or near the proposed NMD support facilities locations. One IRP site (abandoned landfill) is located within the proposed GBI site Alternative B. It is not anticipated that the current schedule of investigations and any remediation required at any site on Clear AFS would be affected by the NMD program.

Overall, before beginning NMD construction at Clear AFS, activities would be coordinated with the appropriate base personnel to avoid accidental impacts to remediation efforts and NMD program activities. In addition, construction contractors would be notified of potential ground contamination before construction so appropriate health and safety measures can be taken to avoid human contact with any contaminated areas.

Asbestos. Some of the facilities proposed for modification and demolition as part of the GBI deployment at Clear AFS may contain asbestos-containing material. Prior to any existing building modifications or demolition for deployment, it would be determined if asbestos-containing material exists in the modification area. If asbestos exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Polychlorinated Biphenyls. Remaining PCB-containing equipment on Clear AFS, including filters, ballasts, and small capacitors, have been identified and are scheduled for removal and disposal in accordance with Federal and state regulations. No PCB-based materials would be used for the GBI system.

Lead-based Paint. Some of the facilities proposed for modification and demolition as part of the GBI deployment at Clear AFS may contain lead-based paint. Prior to any existing building modifications or demolition for deployment, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations.

Radon. The radon assessment and mitigation program at Clear AFS is under the direction of the bioenvironmental engineer at Eielson AFB. A Radon Assessment and Mitigation Program Assessment Survey found no samples exceeded the 4 picocuries per liter limit. Radon is not a concern at Clear AFS.

Pesticides. Under the Proposed Action, pesticides would be used within the GBI deployment area. Pesticides would be applied in accordance with Clear AFS procedures using personnel certified as pesticide applicators. The small amount of pesticides required for the NMD program would be similar to the quantities already applied in developed

areas of the installation. Overall, there would be little change in pesticide usage amounts at Clear AFS.

Cumulative Impacts

Potential cumulative hazardous materials and hazardous waste impacts could occur at Clear AFS with the combination of GBI deployment activities and ongoing and future hazardous materials and hazardous waste management activities. Current and future activities at Clear AFS would not result in a change in the overall installation mission or in ongoing hazardous materials and hazardous waste management programs. The construction and operation of one or more NMD activities at Clear AFS, including the GBI and BMC2 elements, in combination with ongoing installation activities and future base programs would result in an increase in the amounts of hazardous materials used and hazardous waste generated on Clear AFS. However, Clear AFS has the mechanisms and management systems in place to store and manage the increased quantity of hazardous materials and hazardous waste. Overall, it is not expected that there would be any cumulative hazardous materials or hazardous waste management issues at Clear AFS.

The construction of the Solid-State Phased Array Radar on Clear AFS would also increase the use of hazardous materials and generation of hazardous waste within the region; however, this would be handled in accordance with appropriate Federal, state, and local regulations. Once the radar is in place, there would be an overall reduction in hazardous materials used and waste generated at Clear AFS.

Mitigation Measures

No mitigation measures would be required.

4.3.1.5.1.2 Fort Greely—Hazardous Materials and Hazardous Waste Management

Construction

The proposed site for the GBI element at Fort Greely is just south of the main base cantonment. Deployment would require the construction of GBI silos and operational support facilities, but most personnel support functions including housing, recreational, public works, and security would utilize existing facilities. The expected hazardous materials and wastes would be similar to those discussed in section 4.3.1.5.

As discussed above, appropriate plans and measures would be implemented during the construction program to minimize hazardous materials and hazardous waste impacts that may result from NMD construction activities. Overall, hazardous materials and hazardous waste management activities are addressed below under Operation.

Operation

Hazardous Materials Management. The types of hazardous materials proposed for use under the Proposed Action would be similar to those currently used at Fort Greely, except for the liquid propellants inside the exoatmospheric kill vehicle as part of the GBI.

Implementation of the Proposed Action would increase the amounts of hazardous materials used on Fort Greely; however, given that the majority of GBI maintenance functions would not occur at Fort Greely, the increase would be minor. The hazardous materials for the NMD program would be managed in compliance with the 1995 Hazardous Waste and Hazardous Materials Standard Operating Procedure Manual. The only new material proposed at Fort Greely would be the liquid propellants. As mentioned previously, these materials would not be stored onsite, but would be contained within the GBI. These materials would be incorporated into the installation's *Oil Discharge Prevention and Contingency Plan* (U.S. Army Alaska, 1998) and SWPPP (U.S. Army Corps of Engineers, 1996). In addition, the liquid propellants would be reported to local authorities in accordance with the EPCRA, as required. Overall, all hazardous materials management activities would be in accordance with existing regulations for the use and storage of hazardous materials at Fort Greely for the NMD program. Transportation of the liquid propellants is addressed above under the general discussion of GBI deployment.

Any underground or aboveground storage tanks within the proposed NMD construction area would be removed before construction activities in accordance with appropriate Federal, state, and local regulations. The storage tanks proposed for the NMD program would contain fuel for the electrical generators required for the NMD system. The exact number and type of storage tanks are not currently known; however, all storage tanks installed as part of the NMD program would comply with appropriate state and Federal regulations.

Hazardous Waste Management. The types of hazardous waste generated under the Proposed Action would be similar to the waste generated by current Fort Greely activities. Under the NMD program, there would not be a large increase in hazardous waste generated at Fort Greely, since most of the maintenance activities associated with GBI deployment would occur at the manufacturing site, not at the deployment base.

Fort Greely has the mechanisms in place to store, manage, and dispose of hazardous waste, including any additional propellant waste that could be generated if a leak within the exoatmospheric kill vehicle should occur. If a leak were to occur, all hazardous waste would be handled in accordance with appropriate regulations. In addition, there would be the appropriate spill containment team with training in the handling of the liquid

propellants with the necessary equipment to manage any leak of the liquid propellants at the GBI deployment base. All hazardous waste generated at the GBI deployment site would be handled through the installation's treatment, storage, and disposal facility. This facility has adequate capacity to handle the additional hazardous waste generated by the NMD program. If realignment of Fort Greely changes current hazardous waste practices on the installation, the NMD program will work with environmental management at Fort Wainwright to ensure disposal of all hazardous waste in accordance with appropriate regulations.

Pollution Prevention. Under the Proposed Action, the NMD system-wide Pollution Prevention Plan would be implemented for GBI activities at Fort Greely. This program would control and reduce the use of hazardous materials on the installation. In addition, the NMD program would comply with the existing base Pollution Prevention Plan. As stated above, the NMD program has generated and will continue to update the system-wide Pollution Prevention Plan, which outlines strategies to minimize the use of hazardous materials over the lifecycle of the NMD program.

Installation Restoration Program. Three buildings at Fort Greely that are potential support facilities for NMD are on the State Priorities List. These include Building 612, where waste drains to the sanitary sewer; Building 601, where transformers, solvents, and herbicides have been stored in the Resource and Utilities yard north of the building; and Building 605, which includes a maintenance shop, paint bay, and battery storage facility.

Prior to beginning NMD construction, activities would be coordinated with the appropriate installation personnel and state regulators to minimize impacts to remediation efforts and NMD program activities. In addition, construction contractors would be notified of potential ground contamination before construction so appropriate health and safety measures can be taken to avoid human contact with any contaminated areas.

The Family Housing Landfill, referred to as Landfill 6, is located within the 243-hectare (600-acre) proposed GBI site at Fort Greely. This landfill covers an area of approximately 4.5 hectares (11 acres) and was originally used for disposal of grubbing material and debris from the construction of the housing units. Although no documentation concerning landfill operations exists, the landfill was reportedly closed in 1960, and is now used as a disposal area for snow collected from the main cantonment area during the winter. (U.S. Army Corps of Engineers, 1996—Postwide Investigation, Fort Greely) This landfill will be avoided to the extent possible with the placement of the GBI element. However, if ground disturbance is required for NMD, further investigations of the landfill may be necessary.

There are 24 solid waste management units within the installation area. There are two non-solid waste management units, the site south of Building 626, where waste solvents have been dumped, and the nuclear waste pipeline and dilution well. There are 12 potentially contaminated areas within the cantonment area. In addition, there are seven sources of potential contamination on properties adjoining the cantonment area. The current schedule of investigations and any remediation required at these sites would not be affected by the NMD program.

Environmental cleanup at Fort Greely has been addressed under both the IRP and the BRAC Environmental Cleanup Program. Numerous sites have been investigated and remediated under these programs. Investigations are now complete at all known sites. Cleanup of the nuclear waste line from the past activities of the SM-1A nuclear reactor is nearing completion, and other cleanup actions at Building 110 and the old firefighter training pits are underway. Building 101, on retained property, and several other sites, on surplus property, are scheduled for cleanup pending funding. None of these cleanup efforts are anticipated to have an impact on NMD activities on Fort Greely. However, NMD construction activities will be coordinated with installation personnel, state, and Federal regulators to ensure no conflicts develop.

Asbestos. Some of the facilities proposed for modification and demolition as part of the GBI deployment at Fort Greely may contain asbestos-containing material. Prior to any existing building modification or demolition for deployment, it would be determined if asbestos-containing material exists in the modification area. If asbestos exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Polychlorinated Biphenyls. There are no PCB-containing materials at Fort Greely. No PCB-based materials would be used for the GBI system.

Lead-based Paint. Some of the facilities proposed for modification and demolition as part of the GBI deployment at Fort Greely may contain lead-based paint. Prior to any existing building modification or demolition for deployment, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations.

Radon. Radon testing of various buildings with the cantonment area found some facilities had concentrations above the U.S. EPA threshold of 4 picocuries per liter. Family housing units with radon levels greater than or equal to 4 picocuries per liter have been mitigated. Before facility construction, the design of the NMD facilities would take into account mitigation measures to reduce radon levels in the buildings.

Pesticides. Under the Proposed Action, pesticides would be used within the GBI deployment area. Pesticides would be applied in accordance with Fort Greely's Integrated Pest Management Plan using personnel certified as pesticide applicators. The small amount of pesticides required for the NMD program would be similar to the quantities already applied in developed areas of the installation. Overall, there would be little change in pesticide usage amounts at Fort Greely.

Cumulative Impacts

Potential cumulative hazardous materials and hazardous waste impacts could occur at Fort Greely with the combination of GBI deployment activities and ongoing and future hazardous materials and hazardous waste management activities. Current and future activities at Fort Greely could include base reuse of much of the cantonment area. The use of hazardous materials and disposal of hazardous waste would be conducted in accordance with applicable regulations; therefore, no cumulative impacts would occur. The construction and operation of NMD activities at Fort Greely, including the GBI and BMC2 elements, in combination with ongoing Installation activities and future base reuse activities would result in an increase in the amounts of hazardous materials used and hazardous waste generated on Fort Greely. However, Fort Greely has the mechanisms and management systems in place to store and manage the increased quantity of hazardous materials and hazardous waste. Overall, it is not expected that there would be any cumulative hazardous materials or hazardous waste management issues at Fort Greely.

Mitigation Measures

No mitigation measures would be required.

4.3.1.5.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Hazardous Materials and Hazardous Waste Management

Construction

Under this alternative, the GBI element would be located at one existing site at the Yukon Training Area, with personnel support functions provided by existing facilities on Eielson AFB and Fort Wainwright. Deployment would require the construction of GBI silos and operational support facilities at the Yukon Training Area, and possibly additional personnel support facilities on Eielson AFB and Fort Wainwright. The expected hazardous materials and wastes would be similar to those discussed in section 4.3.1.5.

As discussed above, appropriate plans and measures would be implemented during the construction program to minimize hazardous materials and hazardous waste impacts that may result from NMD

construction activities. Overall, hazardous materials and hazardous waste management activities are addressed below under Operation.

Operation

Hazardous Materials Management. The types of hazardous materials proposed for use under the Proposed Action would be similar to those currently used at Yukon Training Area/Eielson AFB, except for the liquid propellants inside the exoatmospheric kill vehicle as part of the GBI.

Implementation of the Proposed Action would increase the amounts of hazardous materials used on Yukon Training Area/Eielson AFB; however, given that the majority of GBI maintenance functions would not occur at these locations, the increase would be minor. The hazardous materials for the NMD program would be obtained through the Fort Wainwright Pharmacy system. Fort Wainwright has the mechanisms in place to store and manage the increased quantity of hazardous materials. The only new material proposed for the Yukon Training Area would be the liquid propellants. As mentioned previously, this material would not be stored onsite, but would be contained within the GBI. These materials would be incorporated into Fort Wainwright's Oil and Hazardous Substance Spill Prevention and Response Plan. In addition, the liquid propellants would be reported to local authorities in accordance with the EPCRA, as required. Overall, all hazardous materials management activities would be in accordance with existing regulations for the use and storage of hazardous materials. Transportation of the liquid propellants is addressed above under the general discussion of GBI deployment.

Any underground or aboveground storage tanks within the proposed NMD construction area would be removed before construction activities in accordance with appropriate Federal, state, and local regulations. The storage tanks proposed for the NMD program would contain fuel for the electrical generators required for the NMD system. The exact number and type of storage tanks are not currently known; however, all storage tanks installed as part of the NMD program would comply with appropriate state and Federal regulations.

Hazardous Waste Management. The types of hazardous waste generated under the Proposed Action would be similar to the waste generated by current Yukon Training Area/Eielson AFB activities. Under the NMD program, there would be a slight increase in hazardous waste generated at Yukon Training Area/Eielson AFB, since most of the maintenance activities associated with GBI deployment would occur at the manufacturing site, not at the deployment base.

Both Fort Wainwright and Eielson AFB have the mechanisms in place to store, manage, and dispose of hazardous waste, including any additional propellant waste that could be generated if a leak within the

exoatmospheric kill vehicle should occur. If a leak were to occur, all hazardous waste would be handled in accordance with appropriate regulations. In addition, there would be the appropriate spill containment team with training in the handling of the liquid propellants with the necessary equipment to manage any leak of the liquid propellants at the GBI deployment base. All hazardous waste generated at the GBI deployment site would be handled in accordance with the host installation's (either Fort Wainwright for the Yukon Training Area or Eielson AFB) disposal methods. These facilities have adequate capacity to handle the additional hazardous waste generated by the NMD program.

Pollution Prevention. Under the Proposed Action, the NMD GBI activities at Yukon Training Area/Eielson AFB would utilize the existing host installation's (either Fort Wainwright for the Yukon Training Area or Eielson AFB) Pharmacy Program. This program controls and reduces the use of hazardous materials on the base. In addition, the NMD program would comply, as required, with the host installation's Pollution Prevention Plan. As stated above, the NMD program has generated and will continue to update the system Pollution Prevention Plan, which outlines strategies to minimize the use of hazardous materials for the NMD program.

Installation Restoration Program. Only two sites are located near potential NMD required facilities at Eielson AFB: SS31, a former PCB storage facility, and ST16, location of a fuel line spill. Both of these sites are currently in a no further action status. In the Yukon Training Area, no investigation has been performed. However, there is a low potential for unexploded ordnance in the area, due to the long history of military training. Most of the ordnance consists of small arms ammunition and 40-millimeter practice grenades.

Before beginning NMD construction, activities would be coordinated with the appropriate installation personnel and state regulators to minimize impacts to remediation efforts and NMD program activities. In addition, construction contractors would be notified of potential ground contamination and safety hazards before construction so appropriate health and safety measures can be taken to avoid human contact with any contaminated areas.

Asbestos. Some of the facilities proposed for modification and demolition as part of the GBI deployment at Eielson AFB may contain asbestos-containing material. Prior to any existing building modification or demolition for deployment, it would be determined if asbestos-containing material exists in the modification area. If asbestos exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Polychlorinated Biphenyls. There are no PCB-containing materials on either the Yukon Training Area within the proposed GBI site or Eielson AFB. No PCB-based materials would be used for the GBI system.

Lead-based Paint. Some of the facilities proposed for modification and demolition as part of the GBI deployment at Eielson AFB may contain lead-based paint. Prior to any existing building modification or demolition for deployment, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations.

Radon. A Radon Assessment and Mitigation Program Assessment Survey at Eielson AFB found no samples (out of 1,247) exceeded the 4 picocuries per liter limit, with 2.4 picocuries per liter being the highest level measured. Radon is not a concern at Eielson AFB. No survey has been done for the Yukon Training Area; however, according to the USGS (1995—Radon Potential for the United States), the majority of Interior Alaska is classified as an area of moderate and/or variable radon concentration levels. Radon levels in the vicinity of the Yukon Training Area could range from 2 to 4 picocuries per liter.

Pesticides. Under the Proposed Action, pesticides would be used within the GBI deployment area. Pesticides would be applied in accordance guidance established by the Pest Management Section of Fort Wainwright. Personnel certified as pesticide applicators would be employed for this task. The small amount of pesticides required for the NMD program would be similar to the quantities already applied in developed areas of the installation. Overall, there would be little change in pesticide usage amounts.

Cumulative Impacts

Potential cumulative hazardous materials and hazardous waste impacts could occur at Yukon Training Area/Eielson AFB with the combination of GBI deployment activities and ongoing and future hazardous materials and hazardous waste management activities. Current and future activities at Yukon Training Area/Eielson AFB would not result in a change in the overall installation mission or in ongoing hazardous materials and hazardous waste management programs. Two NMD elements, GBI and BMC2, could potentially be constructed and operated at the joint Yukon Training Area/Eielson AFB installations. These NMD activities, in combination with ongoing Yukon Training Area/Eielson AFB missions and future base construction programs, would result in an increase in the amounts of hazardous materials used and hazardous waste generated on Yukon Training Area/Eielson AFB. However, the mechanisms and management systems are in place to store and manage the increased quantity of hazardous materials and hazardous waste.

Overall, cumulative hazardous materials or hazardous waste management issues are expected.

Construction of the Consolidated Munitions Facility, Weapons and Release System Shop, Transportation Heavy Maintenance Facility, Supply Complex, Vehicle Munitions Heated Parking, HAZWASTE Collection Facility, Wellness Center, and 10 other non-NMD support facilities would also increase the use of hazardous materials and generation of hazardous waste within the region; however, this increase would be handled in accordance with appropriate Federal, state, and local regulations.

Mitigation Measures

No mitigation measures would be required.

4.3.1.5.2 North Dakota Installations

Section 3006 of RCRA provides a means for each state, at its option, to promulgate and enforce its own hazardous waste management regulations and to operate a state program after receipt of authorization from the U.S. EPA. For the State of North Dakota, the North Dakota Department of Health has jurisdiction over hazardous materials and wastes management.

4.3.1.5.2.1 Grand Forks AFB—Hazardous Materials and Hazardous Waste Management

Construction

The proposed site for the GBI element at Grand Forks AFB is located in the southeast part of the installation. Deployment would require the construction of GBI silos and some operational support facilities with personnel support functions supported by existing base facilities. The expected hazardous materials and wastes would be similar to those discussed in section 4.3.1.5.

As discussed above, appropriate plans and measures would be implemented during the construction program to minimize hazardous materials and hazardous waste impacts that may result from NMD construction activities. Overall, hazardous materials and hazardous waste management activities are addressed below under Operation.

Operation

Hazardous Materials Management. The types of hazardous materials proposed for use under the Proposed Action would be similar to those currently used at Grand Forks AFB, except for the liquid propellants inside the exoatmospheric kill vehicle as part of the GBI.

Implementation of the Proposed Action would increase the amounts of hazardous materials used on Grand Forks AFB; however, given that the majority of GBI maintenance functions would not occur at Grand Forks AFB, the increase would be minor. The hazardous materials for the NMD program would be obtained through the Grand Forks HAZMART. Grand Forks AFB has the mechanisms in place to store and manage the increased quantity of hazardous materials. The only new material proposed for Grand Forks AFB would be the liquid propellants. As mentioned previously, this material would not be stored onsite, but would be contained within the GBI. These materials would be incorporated into the base Oil and Hazardous Substance Spill Prevention and Response Plan. In addition, the liquid propellants would be reported to local authorities in accordance with the EPCRA, as required. Overall, all hazardous materials management activities would be in accordance with existing regulations for the use and storage of hazardous materials at Grand Forks AFB for the NMD program. Transportation of the liquid propellants is addressed above under the general discussion of GBI deployment.

Any underground or aboveground storage tanks within the proposed NMD construction area would be removed before construction activities in accordance with appropriate Federal, state, and local regulations. The storage tanks proposed for the NMD program would contain fuel for the electrical generators required for the NMD system. The exact number and type of storage tanks are not currently known; however, all storage tanks installed as part of the NMD program would comply with appropriate state and Federal regulations.

Hazardous Waste Management. The types of hazardous waste generated under the Proposed Action would be similar to the waste generated by current Grand Forks AFB activities. Under the NMD program, there would be a minor increase in hazardous waste generated at Grand Forks AFB, since most of the maintenance activities associated with GBI deployment would occur at the manufacturing site, not at the deployment base.

Grand Forks AFB has the mechanisms in place to store, manage, and dispose of hazardous waste, including any additional propellant waste that could be generated if a leak within the exoatmospheric kill vehicle should occur. If a leak were to occur, all hazardous waste would be handled in accordance with appropriate regulations. In addition, there would be the appropriate spill containment team with training in the handling of the liquid propellants with the necessary equipment to manage any leak of the liquid propellants at the GBI deployment base. All hazardous waste generated at the GBI deployment site would be handled through the base's treatment, storage, and disposal facility. This facility has adequate capacity to handle the additional hazardous waste generated by the NMD program.

Pollution Prevention. Under the Proposed Action, the NMD GBI activities at Grand Forks AFB would utilize the existing base Pharmacy Program. This program controls and reduces the use of hazardous materials on the base. In addition, the NMD program would comply, as required, with the base Pollution Prevention Plan. As stated above, the NMD program has generated and will continue to update the system Pollution Prevention Plan, which outlines strategies to minimize the use of hazardous materials for the NMD program.

Installation Restoration Program. Under the Proposed Action, both the Weapons Storage Area and OT-5 area options are near potential contaminated sites. Sites near the Weapons Storage Area include ST-06 (underground storage tanks), ST-07 (benzene groundwater plume), oil/water separators (Buildings 304, 314, and 701), and underground waste storage tanks (Buildings 200, 306, 737, and 761). Of these sites, ST-06 was closed and Buildings 200, 306, 314, and 737 are recommended for no further action and should not present any impacts to continue investigations or NMD activities. Although there is groundwater contamination associated with ST-07, continued investigations and remediation would not be impacted by NMD activities. It is anticipated that proposed NMD activities would not impact continued investigations at Buildings 304, 701, and 761. Investigations and any remediation required at these sites would be completed before construction.

The only site of concern in the OT-5 area is the former explosive and ordnance detonation area, which was closed and considered a low-risk level. Prior to construction in this area, further studies would be required to ensure that contamination does not present any issues to worker safety or the environment.

Overall, before beginning NMD construction at Grand Forks AFB, activities would be coordinated with the appropriate base personnel to minimize impacts to remediation efforts and NMD program activities. In addition, construction contractors would be notified of potential ground contamination before construction so appropriate health and safety measures can be taken to avoid human contact with any contaminated areas.

Asbestos. Some of the facilities proposed for modification and demolition as part of the GBI deployment at Grand Forks AFB may contain asbestos-containing material. Prior to any existing building modification or demolition for deployment, it would be determined if asbestos-containing material exist in the modification area. If asbestos exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Polychlorinated Biphenyls. All known PCB-containing transformers, hydraulic systems, heat transfer components, and other PCB items have been removed from Grand Forks AFB (U.S. Department of the Air Force, 1999—Final EIS, Minuteman III Missile System Dismantlement). No PCB-based material would be used for the GBI system.

Lead-based Paint. Some of the facilities proposed for modification and demolition as part of the GBI deployment at Grand Forks AFB may contain lead-based paint. Prior to any existing building modification or demolition for deployment, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations.

Radon. Radon testing of housing units in 1989 on Grand Forks AFB found some units had concentrations above the U.S. EPA threshold of 4 picocuries. Mitigation efforts occurred in 1991. Before facility construction, the design of the NMD facilities would take into account mitigation measures to reduce radon levels in the buildings.

Pesticides. Under the Proposed Action, pesticides would be used within the GBI deployment area. Pesticides would be applied in accordance with Grand Forks AFB procedures using personnel certified as pesticide applicators. The small amount of pesticides required for the NMD program would be similar to the amounts already applied in the Weapons Storage Area and OT-5 area, so overall there would be little change in pesticide usage amounts at Grand Forks AFB.

Cumulative Impacts

Potential cumulative hazardous materials and hazardous waste impacts could occur at Grand Forks AFB with the combination of GBI deployment activities and ongoing and future hazardous materials and hazardous waste management activities. Current and future activities at Grand Forks AFB would not result in a change in the overall base mission or in ongoing hazardous materials and hazardous waste management activities. The BMC2 element could also potentially be constructed and become operational at Grand Forks AFB. NMD activities in combination with ongoing Grand Forks AFB activities and future base construction programs would result in an increase in the amounts of hazardous materials used and hazardous waste generated on Grand Forks AFB. However, Grand Forks AFB has the mechanisms and management systems in place to store and manage the increased quantity of hazardous materials and hazardous waste. Overall, it is not expected that there would be any cumulative hazardous materials or hazardous waste management issues at Grand Forks AFB.

The restoration of the city of Grand Forks and Devils Lake from flood damage would also increase the use of hazardous materials and generation of hazardous waste within the region; however, this increase would be handled in accordance with appropriate Federal, state, and local regulations.

Mitigation Measures

No mitigation measures would be required.

4.3.1.5.2.2 Missile Site Radar—Hazardous Materials and Hazardous Waste Management

Construction

The proposed site for the GBI element at the Missile Site Radar includes most of the original site. Deployment would require the construction of GBI silos, operational support facilities, and personnel support facilities. The expected hazardous materials and wastes would be similar to those discussed in section 4.3.1.5.

As discussed above, appropriate plans and measures would be implemented during the construction program to minimize hazardous materials and hazardous waste impacts that may result from NMD construction activities. Overall, hazardous materials and hazardous waste management activities are addressed below under Operation.

Operation

Hazardous Materials Management. There is no current operational hazardous materials program or plan active at the Missile Site Radar. Implementation of the Proposed Action would require small amounts of hazardous materials to be used on the Missile Site Radar, given that the majority of GBI maintenance functions would not occur at the Missile Site Radar. The hazardous materials used at the GBI site would be obtained through a designated DOD facility. The hazardous materials for the NMD program would be obtained through a site-specific HAZMAT pharmacy system designed to safely store and manage the required types and quantities of hazardous materials. These materials would be incorporated into a Spill Prevention and Response Plan. In addition, the liquid propellants would be reported to local authorities in accordance with the EPCRA, as required. Overall, all hazardous materials management activities would be in accordance with existing regulations for the use and storage of hazardous materials at the Missile Site Radar for the NMD program. Transportation of the liquid propellants is addressed above under the general discussion of GBI deployment.

Any underground or aboveground storage tanks within the proposed NMD construction area would be removed before construction activities

in accordance with appropriate Federal, state, and local regulations. The storage tanks proposed for the NMD program would contain fuel for the electrical generators required for the NMD system. The exact number and type of storage tanks are not currently known; however, all storage tanks installed as part of the NMD system would comply with state and Federal regulations.

Hazardous Waste Management. There is no current operational hazardous waste program or plan active at the Missile Site Radar. All hazardous waste generated at the GBI site would be handled through a designated DOD treatment, storage, and disposal facility. Under the NMD program, hazardous wastes would be typical of those found at a military installation and in small amounts, since most of the maintenance activities associated with GBI deployment would occur at the manufacturing site, not at the deployment base. All NMD activities would comply with appropriate Federal, state, and local regulations.

With technical and regulatory support from an existing DOD facility, appropriate procedures and facilities would be established at the Missile Site Radar to store, manage, and dispose of hazardous waste, including any additional propellant waste that could be generated if a leak within the exoatmospheric kill vehicle should occur. If a leak were to occur, all hazardous waste would be handled in accordance with appropriate regulations. In addition, there would be the appropriate spill containment team with training in the handling of the liquid propellants with the necessary equipment to manage any leak of the liquid propellants at the GBI deployment base.

Pollution Prevention. Under the Proposed Action, the NMD GBI activities at the Missile Site Radar, the NMD system-wide Pollution Prevention Plan would be implemented. This program would control and reduce the use of hazardous materials on the installation. In addition, the NMD program would comply, as required, with existing state regulatory requirements. As stated above, the NMD program has generated and will continue to update the system-wide Pollution Prevention Plan, which outlines strategies to minimize the use of hazardous materials over the lifecycle of the NMD program.

Installation Restoration Program. At the Missile Site Radar, a preliminary investigation revealed several potential areas of concern, including a pipe tunnel with very low concentrations of total petroleum hydrocarbons (less than state action level); wastewater pond sediment samples with concentrations of total petroleum hydrocarbons above state action levels; a Fire Water Storage Pond containing two volatile organic compounds; and seven electric vaults containing substantial concentrations of total petroleum hydrocarbons, as well as an oily layer. (U.S. Army Center for Health Promotion and Preventative Medicine, 1995—Final Report, Site Inspection, SRMSC) It is anticipated that proposed NMD activities would

not impact continued investigations and any remediation required at these sites.

Overall, before beginning NMD construction at the Missile Site Radar, activities would be coordinated with the appropriate base personnel to minimize impacts to remediation efforts and NMD program activities. In addition, construction contractors would be notified of potential ground contamination before construction so appropriate health and safety measures can be taken to avoid human contact with any contaminated areas.

Asbestos. Some of the facilities proposed for modification and demolition as part of the GBI deployment at the Missile Site Radar may contain asbestos-containing material. Prior to any existing building modification or demolition for deployment, it would be determined if asbestos-containing material exist in the modification area. If asbestos exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Polychlorinated Biphenyls. A PCB survey conducted in 1990 at the Missile Site Radar facility and associated Remote Site Launch Sites resulted in the removal of transformers and other items containing PCBs. A subsequent survey has determined that 37 remaining items at these sites may contain PCBs below levels currently regulated by the U.S. EPA. (U.S. Army Space and Strategic Defense Command, 1994—Site Investigation and Analysis Engineering Report) Prior to any existing building modification or demolition for GBI deployment, it would be determined if PCB-containing items exist in the modification area. If PCBs do exist, the equipment and material would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Lead-based Paint. Some of the facilities proposed for modification and demolition as part of the GBI deployment at the Missile Site Radar may contain lead-based paint. Prior to any existing building modification or demolition for deployment, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations.

Radon. Radon concentrations in the vicinity of the Missile Site Radar could exceed the U.S. EPA threshold of 4 picocuries (U.S. Geological Survey, 1993—Generalized Geologic Radon Potential of the Upper Midwest). A radon survey completed for the Missile Site Radar found Building 348, now demolished, and Building 360 to have levels of radon above 4 picocuries per liter. All other facilities surveyed were below 4 picocuries per liter (Greenwood, 1999—Comments received by EDAW,

Inc., regarding the NMD Deployment Coordinating Draft DEIS). Before facility construction, the design of the NMD facilities would take into account mitigation measures to reduce radon levels to acceptable standards in all facilities.

Pesticides. Under the Proposed Action, pesticides would be used within the GBI deployment area at the Missile Site Radar. Pesticides would be applied in accordance with DOD and state regulations using personnel certified as pesticide applicators. Only a small amount of seasonal pesticides would be required for the NMD program.

Cumulative Impacts

There are no activities at the Missile Site Radar that when combined with the GBI deployment and operation activities would result in cumulative hazardous materials and hazardous waste impacts. The BMC2 element could also potentially be constructed and become operational at the Missile Site Radar. These combined NMD activities would result in an increase in the amounts of hazardous materials used and hazardous waste generated on the Missile Site Radar; however, mechanisms and management systems would be implemented to store and manage the increased quantity of hazardous materials and hazardous waste.

The only other project that could result in a cumulative impact would be the potential dismantlement and destruction of some facilities at the Missile Site Radar. The majority of this activity would need to be completed before the start of the main NMD construction activities. There is the potential that some construction activities could overlap, subsequently increasing the amount of construction-related hazardous materials and wastes at the Missile Site Radar. This increase would be minimal and would be stored and managed in accordance with state and Federal laws. Overall, it is not expected that there would be any cumulative hazardous materials or hazardous waste management issues at the Missile Site Radar. Currently, no other projects are planned at the Missile Site Radar.

Mitigation Measures

No mitigation measures would be required.

4.3.1.6 Health and Safety

GBI health and safety impacts are evaluated by determining the processes in the NMD deployment that have the greatest potential for damage or injury. Selected steps in the GBI deployment would provide greater risk to human health, environment, and property, and therefore are evaluated for possible mishap scenarios. Such possible mishap scenarios include mishandling of the missile components, accidents in transporting the GBI, liquid propellant mishaps, accidental launches, and natural hazards such as earthquakes. Other potential health and safety issues would be associated with construction of the GBI and support elements and conflicts with existing safety hazards at the deployment location. The following were used to determine potential impacts:

- A transportation mishap during GBI shipment that could impact the public by either debris or toxic emissions
- A mishap during GBI handling that could cause ignition of the solid propellants and impact public areas by either debris or toxic emissions
- A leak in the liquid propellants that would exceed exposure safety guidance in areas where the public could be impacted
- Located the silos and support structures in areas with existing health and safety risks that could impact NMD operations.

The potential for some GBI mishaps during deployment such as an accident during transportation, a mishap during GBI handling, liquid propellant mishaps, accidental launches, or general construction issues are common to any deployment locations. Therefore, these potential mishaps are addressed below. Deployment site-specific analysis will focus on those health and safety issues that pertain to each site. Potential impacts related to construction worker exposure to asbestos, lead-based paint, and ground/water site contamination are addressed under Hazardous Materials and Hazardous Waste Management (section 4.3.1.5).

GBI Transportation

It is expected that there would be 100 silos deployed at the GBI site, which would require 50 one-time airlifts for initial deployment. Once the system is deployed, approximately 20 airlifts (10 flights to the deployment base and a corresponding 10 flights back to the integration facility) and ground trips would be required per year to support GBI operational maintenance and testing. The GBI would be shipped fueled to the deployment base and during the return trip to the integration facility. No de-tanking of the liquid propellants would occur at the deployment base unless required for emergency purposes.

Air Transportation. The GBI would be transported in the deployment canister contained within a shipping container by cargo aircraft from the integration facility to the GBI deployment site or nearest airfield. For Alaska, the only landing bases near all of the potential deployment sites would be Eielson AFB and Fort Greely. From these locations, the GBI would be transported by ground to the potential deployment bases. For North Dakota, the landing base would be Grand Forks AFB. The canister would contain the solid propellant booster and the liquid propellant exoatmospheric kill vehicle. Up to two interceptors would be transported per aircraft. Before shipment, the interceptor within the canister would be inspected to ensure no leaks of the liquid propellant have occurred. A monitoring system would be in place for the liquid propellants that would provide timely and accurate notification on any leakage. No access into the canister would occur during flight. However, leaks in the system are unlikely, given that the system would be checked before aircraft departure and the propellants would be contained within a system that contains multiple safeguards preventing a leak of either of the propellants.

An aircraft accident during transportation is considered highly unlikely. The potential for a major (destruction of the aircraft) cargo aircraft accident is approximately 1 to 3 accidents per 100,000 hours flown. Based on annual flying hours of approximately 150 for the GBI deployment, assuming 20 airlift operations, a major aircraft accident might be expected to occur every 200 to 300 years. Overall, the potential for an aircraft accident while transporting the GBI would have no greater risk than any other commercial or military aircraft cargo flight and thus is considered very remote.

Ground Transportation. An accident of the transporter moving the GBI from the landing base to the deployment site or on the deployment site is considered remote. Transportation of the GBI would be similar to that used for Minuteman and other DOD missile systems. As addressed in section 3.8.2.2, the Air Force has a long record of safe handling and maintenance of missiles. Approximately 804,650 kilometers (500,000 road miles) have been driven by transporter-erectors carrying Minuteman missiles (I, II, and III) between the deployment bases and the launch facilities. In roughly 30 years, only six rollover accidents have occurred, with none involving propellant ignition (U.S. Department of the Air Force, 1999—Final EIS, Minuteman III Missile System Dismantlement). In addition, the Air Force reported that during the system life of the Minuteman missiles, over 11,000 missile movements have occurred by air, rail, and road; and over 12,400 individual Minuteman solid stages have been transported without a significant mishap (fire or explosion) (U.S. Department of the Air Force, 1992—Transportation of Minuteman II Solid Rocket Motors to Navajo Depot Activity, Arizona and Kirtland AFB, New Mexico). Additionally, the potential for an accident to solid rocket

motors and any resulting hazards was analyzed in two EAs (U.S. Department of the Air Force, 1994—Transportation and Storage of Rocket System Launch Program Solid Rocket Motors; U.S. Department of the Air Force, 1992—Transportation of Minuteman II Solid Rocket Motors to Navajo Depot Activity, Arizona and Kirtland AFB, New Mexico). Both EAs concluded that there would be no significant impact on human health and safety or the environment. Since the NMD transportation method would be similar to that used by the Air Force, it would be expected that the potential for an accident and resulting fire or explosion would be remote.

Lightning strikes and static discharges are very unlikely events. In the 30 years of operations in the Minuteman Missile Wing, there has been no record of lightning striking a transporter. Measures would be taken to prevent static buildup during transportation.

As discussed above, the potential for an accident and resulting fire or explosion during GBI transportation is considered remote. A transportation safety plan in accordance with the appropriate DOD and DOT regulations would be written before any shipment, and transportation crews would receive the appropriate training in accordance with the plan. Provided below is a description of the types of impacts that could be anticipated in the unlikely event of a transportation mishap that resulted in ignition of the solid propellant.

The solid propellant stages proposed for the NMD program are designed to burn rapidly and would be difficult to extinguish. The propellant classification for the GBI has not been finalized but could be either Class 1.1 or 1.3 propellant. Any explosion of Class 1.3 propellant would most likely be pressure ruptures of the motor casing, which may produce fragments. Any blast overpressures would be localized. Class 1.1 propellant is principally considered a blast hazard, although in a fire it will burn at a rate comparable to that of rubber tires. If detonated, Class 1.1 propellant would produce blast overpressure and fragments beyond 305 meters (1,000 feet) (U.S. Department of the Air Force, 1992—Transportation of Minuteman II Solid Rocket Motors to Navajo Depot Activity, Arizona and Kirtland AFB, New Mexico).

Accidental ignition of solid propellant can be caused by static discharge, lightning, or a nearby fire or explosion. Additionally, impact of the rocket motor casing against any object or penetration of the rocket motor's casing may produce enough internal or external frictional energy release to cause ignition. However, detonation resulting solely from an impact is highly unlikely. For example, a quantity of bare Class 1.1 propellant of approximately 1,678 kilograms (3,700 pounds) would require an impact on steel at a rate of 225 kilometers per hour (140 miles per hour) to have a 50 percent probability of detonation. Much less energy is required for ignition of the propellant. Therefore, in an accident, the most credible

event is a brief but intense fire caused by a rupture of the motor casing and ignition by some source (U.S. Department of the Air Force, 1992—Transportation of Minuteman II Solid Rocket Motors to Navajo Depot Activity, Arizona and Kirtland AFB, New Mexico). Such a fire would be very close to the road while it was being controlled and cleaned-up. There could be damage to the roadway. The vicinity of the fire would likely have to be evacuated until the fire is burned out and the smoke cleared. Because of the intensity of solid propellant fires, they are controlled, but cannot be extinguished. The force of the rupture and ejection of debris could be fatal to persons within 91 meters (300 feet) and could cause serious injuries and property damage within 213 meters (700 feet). Life threatening radiated heat energy could occur to unprotected persons within 40 meters (130 feet) of the visible flame (U.S. Department of the Air Force, 1994—Transportation and Storage of Rocket System Launch Program Solid Rocket Motors).

As described above, the potential for a ground transportation accident is remote; however, if an accident does occur, large amounts of aluminum oxide, carbon monoxide, and hydrogen chloride could be released to the immediate surroundings. The liquid propellants in the exoatmospheric kill vehicle would be consumed during the solid propellant fire and would not pose a health risk. For hydrogen chloride, the main toxic product of solid rocket motor, the immediately dangerous to life or health concentrations (IDLH) exposure limit for a 30-minute duration is 75 milligrams per cubic meter. The Short-Term Public Emergency Guidance Level for a 1-hour exposure duration of 1.5 milligrams per cubic meter has been established by the National Research Council. Exposure to hydrogen chloride could cause burning of the eyes, nose, and throat. The smoke from hydrogen chloride is white and easily visible. Although there are other hazardous air pollutants associated with solid rocket propellant (e.g., nitrogen dioxide), hydrogen chloride would have the greatest impact due to its greater concentration. Therefore, measures designed to keep the public safe from exposure to hydrogen chloride would also be expected to keep them safe from other toxins in the exhaust.

Modeling for health and safety impacts was performed using the Open-Burn Open-Detonation Dispersion Model. This model was specifically developed to estimate air quality impacts due to open burning or detonation of explosives and fuels. The likely accident scenario would be similar to an open burn. For analysis purposes, it was assumed that 100 percent of one GBI solid propellant system burns in one area over a short-time period. Results of modeling indicated that peak hydrogen chloride emissions would be 14.37 milligrams per cubic meter, which is well below the IDLH exposure limit of 75 milligrams per cubic meter. The peak 1 hour time-weighted average would be 1.3056 milligrams per cubic meter, which is also below the Short-Term Public Emergency Guidance Level of 1.5 milligrams per cubic meter.

GBI Handling

The handling of the GBI at a potential deployment base would be in accordance with standard safety procedures developed by DOD for the handling of solid and liquid propellants. In addition, all aspects of OSHA regulations would be followed for the NMD program. Upon arrival at the deployment site, the canisterized interceptor would be transferred via Missile Transporter from the aircraft to the Interceptor Receiving and Processing Building, where the system would be inspected for any damage that may have occurred during transport. In addition, the system would be checked to ensure no leaks of liquid propellants had occurred. After inspection, the missile would be transferred to the silo using a transporter emplacer. Prior to any missile transfer operations, equipment (i.e., crane) would be inspected. Most of the procedures utilized for deployment and handling of the GBI are based on those used for the Minuteman and other military systems where a long history of safety procedures has been developed; therefore, the handling of the GBI would not present a significant health and safety risk. However, a mishap that would result in a hard shock to the GBI could result in a fire or explosion of the solid and liquid propellant. Based on the safety procedures that would be in place as described above, the possibility is considered remote. Any burning of the GBI from an accident during handling or while in the silo would be similar to that described above during transportation. Once deployed, the ESQD for the GBI would be up to 479 meters (1,570 feet). Within this distance, no occupied structures unnecessary to the operation of the GBI would be permitted. In addition, separation of the GBIs in the silos would prevent any potential for a mishap impacting more than one GBI at any time.

Liquid Propellants

The exoatmospheric kill vehicle on the GBI would contain approximately 7 kilograms (15 pounds) or 8 liters (2 gallons) of monomethylhydrazine and 8 kilograms (18 pounds) or 6 liters (1.5 gallons) of nitrogen tetroxide. The liquid propellant would arrive at the GBI deployment site already fueled in the exoatmospheric kill vehicle. The canister system used for the GBI would have a monitor system to check for leaks of the liquid propellant. A leak of either propellant could result in the release of hazardous material inside the canister; however, the liquid propellants would have multiple safeguards requiring several system failures before a leak would occur, thereby making the potential for a leak very remote. However, to estimate the type and magnitude of potential impacts, a catastrophic (and unlikely) event of an instantaneous spill of one of the liquid propellants was analyzed to evaluate the magnitude of the potential consequences. This catastrophic event would require penetration (e.g., by a forklift or a sharp object) of the canister, booster casing, and the liquid propellant tank. This event should not happen while the booster is in the silo during normal operations.

Monomethylhydrazine is a clear, colorless liquid with an ammonia-like or "fishy" odor. The propellant is toxic and corrosive to the skin. The combustion products are also toxic. The vapors may easily be ignited by a spark, but the liquid is not shock sensitive. Hydrazine-type liquid fuels present a serious fire hazard and a toxic vapor hazard. Hydrazines are suspected human carcinogens. Hydrazine vapor concentrations above the 0.35 milligram per cubic meter (0.2 ppm) threshold limit value may be irritating to the nose, throat, upper respiratory tract, and lungs. The IDLH exposure limit is 38 milligrams per cubic meter (20 ppm). The vapors can also cause eye irritation, inflammation, swelling, redness, and discharge. Pulmonary edema and lung damage may occur. Damage may also result to the liver, kidneys, and blood. Literature searches did not reveal any irreversible health effects from hydrazines resulting from levels of exposure below workplace exposure guidelines. OSHA has set workplace permissible exposure limits (PELs) at 0.35 milligram per cubic meter (0.2 ppm).

Nitrogen tetroxide is a heavy, reddish-brown liquid. Because of its low boiling point, a heavy concentration of toxic reddish-brown vapor will be given off if the liquid surface is open to the atmosphere. It is important to note that only 15 percent of the vapors will have the characteristic reddish-brown color; the remainder will be colorless. The reddish-brown color is due to the presence of nitrogen dioxide, which is a monomer of nitrogen tetroxide. The liquid is highly corrosive to human tissue. It supports combustion of all hydrocarbons and is hypergolic with hydrazine. A pungent, acrid odor is detectable at 0.12 ppm; therefore, it is considered a substance with adequate warning properties. The OSHA PEL for nitrogen tetroxide (nitrogen dioxide) is 9 milligrams per cubic meter (5 ppm). The IDLH exposure limit for nitrogen dioxide is 38 milligrams per cubic meter (20 ppm). Exposure to low-levels of fumes may cause only eye and nose irritation and yellow staining of the skin. At higher levels of exposure (25 ppm), there is respiratory irritation with cough and chest pain. Exposure to levels of nitrogen dioxide vapors below workplace exposure guidelines is not known to result in irreversible damage.

A leak would be characterized as an evaporating liquid, or as a gaseous cloud that is generally neutral buoyant, or heavier than air. A class of dispersion models, commonly known as cold spill models, were developed to model the dispersion of neutrally buoyant or denser-than-air gases produced from liquid spills. The Air Force Toxic Program was used to model these releases and to provide an estimate of downwind concentrations. Only cold spills were evaluated because, in general, spills involving unreacted hypergolic propellants pose the greatest health hazard to human and ecological populations.

Leak of the liquid propellants was modeled assuming an instantaneous leak (e.g., the entire container leaks at once). Since the system would be

monitored for leaks at all times and emergency equipment would be near the GBI, the actual response time would almost be immediate. Table 4.3.1.6-1 shows the results of modeling for monomethylhydrazine and nitrogen tetroxide. Only a leak of the nitrogen tetroxide is expected to exceed the OSHA ceiling standard. Neither liquid propellant would exceed the IDLH standard. The level of exposure for the nitrogen tetroxide as a result of a leak would not cause irreversible damage. Exposure at these levels, given that most off-base public exposure would occur in open air conditions, would be mildly irritating to the eyes and nose and could include coughing.

Table 4.3.1.6-1: Results of Air Force Toxic Program Modeling

Standard	Monomethylhydrazine		Nitrogen Tetroxide	
	Guidance in milligrams per cubic meter (parts per million)	Exceedance Distance	Guidance in milligrams per cubic meter (parts per million)	Exceedance Distance
OSHA Permissible Exposure Limit	0.35 (0.2)	Not applicable[1]	9 (5)	760 meters (2,493 feet)
Immediately Dangerous to Life or Health	38 (20)	Not applicable[1]	38 (20)	Not exceeded

[1] Safe exposure levels should not be exceeded under most meteorological conditions. Any exceedance would be less than nitrogen tetroxide distances and contained within the GBI site boundary.

Given the isolation of the liquid propellant (separated from the solid propellant by a fire wall), the potential for a leak of either propellant to cause the solid propellant to catch fire is unlikely; however, this could occur during a catastrophic (crash) situation, which would be expected to result in complete combustion of the GBI. This would result in the liquid propellants being consumed in the solid propellant fire, which is addressed above.

Current plans for the GBI include a sensor system to monitor the condition/status of the exoatmospheric kill vehicle propellant system. Any leak that would occur would be handled by a specially designated emergency response team with the appropriate equipment at the deployment site to reduce any health and safety risk to workers and the general public. Specific health and safety plans would be developed for operation of the GBI site before deployment including evacuation plans and notification of local offsite emergency response as required. The local fire departments would be notified on the GBI deployment sites through the existing mutual aid agreements with the installations.

Accidental Launches

To ensure an accidental launch of a GBI does not occur, the system would have a human in control at all times in addition to software and hardware safety systems. Additionally, stringent DOD operating procedures, which prevent launch by any one person, would be followed.

General Construction

The construction of the GBI element would be conducted in accordance with the *Corps of Engineers Safety and Health Requirements Manual* and OSHA regulations. The construction of new facilities is routinely accomplished for both military and civilian operations and presents only occupational-related effects on the safety and health for workers involved in the performance of construction activity. The siting of the GBI missile field and any related support facilities would be in accordance with DOD standards taking into account hazards of EMR to ordnance, EMR to personnel, EMR to fuel, ESQD, and other facility compatibility issues. All facilities would be designed to take into account regional natural hazards such as earthquakes. Designing facilities to take into account earthquakes and other natural hazardous would reduce the potential for one of these environmental factors causing a mishap at the GBI facility. With the appropriate design, earthquakes should not pose a potential significant risk to facilities and system components.

4.3.1.6.1 Alaska Installations

4.3.1.6.1.1 Clear AFS—Health and Safety

Construction

The GBI silos, the Interceptor Receiving and Process Building, and the Interceptor Storage Facility would all require the establishment of ESQDs at Clear AFS. The establishment of the ESQDs would go through DOD review to ensure there are no incompatible health and safety issues. The proposed ESQDs associated with GBI deployment for either proposed alternative site would fall within the base boundary in an area with no inhabited structures; therefore, an explosion of the GBI within the site should not pose a public health and safety risk.

Construction of the proposed alternative sites would not occur within any EMR hazard areas on the installation; however, a portion of the construction site for the Alternative A option would be within a control zone established by the base to limit construction around the Ballistic Missile Early Warning System radar. This system will no longer be operational in late 2000; therefore, there should be no health and safety conflicts between the two sites. Either of the proposed GBI sites would be outside of the EMR hazard area for the phased-array radar and would therefore not represent any EMR safety issues to construction workers.

The proposed GBI sites would be outside of the Clear Airport runway approach zones.

Operation

During operation, the GBI field would be dormant except for the occasional maintenance activities. See section 4.3.1.6 for a general overview of GBI health and safety issues. As part of GBI deployment at this location, a fire station would be built to meet the GBI facility requirements. In addition, to avoid potential forest fires, appropriate fire breaks would be established around the facility. For the GBI site operation, a health and safety plan would be prepared that would include procedures to handle emergencies involving the GBI. This plan would describe how to handle each type of emergency, the appropriate base and off-base contacts, and an evacuation plan, if necessary.

Either potential GBI deployment alternative would be outside the EMR safety zones of the new proposed phased-array radar on Clear AFS. In addition, an EA prepared for the phased-array radar concluded that the radar is not expected to be a threat to fuel handling operations or ground-based electroexplosive devices (U.S. Department of the Air Force, 1997—EA for Radar Upgrade at Clear AS, Alaska).

Any GBI mishap that would result in a solid propellant fire could generate hazardous air pollutants. As discussed above, at no time is it expected that peak hydrogen chloride (the toxic constituent of main concern burning solid propellants) emission levels would exceed public exposure guidelines.

As discussed above, the potential for a liquid propellant leak is considered remote. However, if a liquid propellant leak were to occur within the GBI, there is the potential for health hazard from the gases. As discussed above, the hazardous extent of the cloud could exceed the OSHA PEL up to 760 meters (2,493 feet) from the leak for nitrogen tetroxide. However, the anticipated level of exposure to nitrogen tetroxide in this area would only be expected to be mildly irritating to the eyes and nose and could include coughing. No irreversible damage would be expected from exposure at these levels. The most likely areas for a spill to occur would be within the Interceptor Receiving and Inspection Facility, the Interceptor Storage Facility, and at the GBI missile field. The hazardous emission at Clear AFS at the GBI Alternative A site would not affect any areas outside of the base boundary and would not include the administrative areas on the base; therefore, there would be minimal public health and safety risk.

A leak at the Alternative B site would exceed the base boundary by 122 hectares (302 acres) and would include the administrative and housing area on the base. There are no occupied structures in the off-base area

that could be potentially exposed. If a spill would occur, this area would be evacuated by emergency response personnel.

For the GBI site operation, a health and safety plan would be prepared that would include procedures to handle emergencies involving the GBI. This plan would describe how to handle each type of emergency, the appropriate base and off-base contacts, and an evacuation plan, if necessary.

Cumulative Impacts

Potential cumulative health and safety impacts are not expected to occur at Clear AFS with the combination of GBI deployment activities and ongoing health and safety risk from current military activities. The only mission on Clear AFS that represents a health and safety risk is associated with the EMR generated from operation of the early warning radar. Since the GBI does not emit any EMR, there would be no cumulative EMR effects.

Although there is the potential for aircraft mishaps to occur in the airspace over the alternative GBI deployment sites because of the proximity to Clear Airport, the likelihood of an aircraft mishap to occur is considered remote due to the low use of this runway. In addition, the GBI deployment sites on Clear AFS are outside of the approach and departure clear zones.

Overall, it is not expected that GBI deployment and operation at Clear AFS would cause a significant increase in the health and safety risk when combined with other ongoing and future programs. Potential deployment of the BMC2 in combination with the GBI would not represent any cumulative health and safety risks.

Mitigation Measures

Mutual aid agreements with local fire departments would need to be updated to inform them of the additional hazards and safety considerations of GBI deployment.

4.3.1.6.1.2 Fort Greely—Health and Safety

Construction

The GBI silos, the Interceptor Receiving and Process Building, and the Interceptor Storage Facility would all require the establishment of ESQDs. The establishment of the ESQDs would go through DOD review to ensure there are no incompatible health and safety issues. All of the proposed ESQDs associated with GBI deployment would fall within the base boundary; therefore, an explosion of the GBI within the hardened facilities should not pose a public health and safety risk. None of the proposed

GBI facilities would fall within the airfield safety zones or within hazardous military operation areas on Fort Greely. During construction, there is a low-potential for contact with some small arms ammunition and 40-millimeter practice grenades. Neither of these should pose a high health and safety risk to construction workers.

Operation

During operation the GBI field would be dormant except for the occasional maintenance activities. See section 4.3.1.6 for a general overview of GBI health and safety issues. A fire department will remain on the base even after realignment of the cantonment area. The fire department is adequate to handle the installation and operation of the GBI element. None of the Army or Air Force training exercises would conflict with the operation of the GBI or present an incompatible health and safety issue. The potential for an aircraft mishap to occur over the GBI field and impact the missile field is considered remote. The main Air Force impact and training areas are west of the proposed site. The proposed GBI site would be in the East Training Area of Fort Greely, which is a nonfiring maneuvering area.

Any GBI mishap that would result in a solid propellant fire could generate hazardous air pollutants. As discussed above, at no time would it be expected that peak hydrogen chloride (the toxic constituent of main concern of burning solid propellants) emission levels would exceed public exposure guidelines.

As discussed above, the potential for a liquid propellant leak is remote; however, if a liquid propellant leak were to occur within the GBI canister on Fort Greely, there is the potential for health hazard from the gases. As discussed above, the hazardous extent of the cloud could exceed the OSHA PEL up to 760 meters (2,493 feet) from the leak for nitrogen tetroxide. The most likely areas for this to occur would be within the Interceptor Receiving and Inspection Facility, the Interceptor Storage Facility, and at the GBI missile field. Hazardous emissions from a propellant leak at Fort Greely could affect up to 14 hectares (35 acres) of land outside of the base boundary. However, the potentially affected area is undeveloped, and there are no public structures or public roads. The hazardous emissions would not affect the Fort Greely Cantonment area. Overall, there would be minimal public health and safety risk.

Within the last 50 years, 19 fires have occurred on Fort Greely; therefore, the potential exists that forest fires could occur near the proposed GBI element location. As part of standard fire fighting practices on Fort Greely, fire breaks would be built around any proposed NMD element. The current fire protection status of the proposed GBI site is Full Protection, which are areas that receive maximum detection coverage and immediate and aggressive initial response. For the GBI

element, this fire protection status would have to be changed to Critical Protection, which are lands that receive maximum detection coverage and are of the highest priorities for response. This status along with the appropriate fire breaks and fire equipment should limit the potential for forest fires spreading into the proposed GBI element area.

For the GBI site operation, a health and safety plan would be prepared that would include procedures to handle emergencies involving the GBI. This plan would describe how to handle each type of emergency, the appropriate base and off-base contacts, and an evacuation plan, if necessary.

Cumulative Impacts

Potential cumulative health and safety impacts are not expected to occur at Fort Greely with the combination of GBI deployment activities and ongoing health and safety risk from current military activities. No new or future programs are planned that could add to potential cumulative impacts. The main cumulative impacts could come from a potential increase in fires or a combination of hazardous activities increasing the health and safety risk.

Deployment of the GBI would not increase the potential for forest fires on Fort Greely. Most GBI activities would occur within facilities or areas cleared of nearby vegetation. Any fire resulting from an accident in GBI operation should not result in a forest fire; therefore, there would be no increased health and safety risk from fires. The change in the fire status (see mitigation measures below) would reduce the potential for fires to impact the GBI deployment site.

Although there is the potential for aircraft mishaps to occur in the airspace over the GBI deployment area, the likelihood of an aircraft mishap to occur on the entire Fort Greely base is considered remote, and even less of a probability to occur directly over the GBI field. The area of the proposed GBI deployment is outside of the main hazardous aircraft overflight area.

Overall, it is not expected that GBI deployment and operation at Fort Greely would cause a significant increase in the health and safety risk when combined with other ongoing programs. Potential deployment of the BMC2 in combination with the GBI would not represent any cumulative health and safety risks.

Mitigation Measures

To reduce the potential for forest fires affecting the GBI element site, the fire protection status for the proposed area would need to be changed from Full Protection to Critical Protection. The Critical Protection status would give the site the highest level of fire fighting protection provided

by the Bureau of Land Management Alaska Fire Service. The U.S. Army would need to coordinate this revision with the Alaska Fire Service.

Mutual aid agreements with local fire departments would need to be updated to inform them of the additional hazards and safety considerations of GBI deployment.

4.3.1.6.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Health and Safety

Construction

Most of the construction associated with GBI deployment would occur on the Yukon Training Area. Deployment of the GBI would not conflict with any existing safety risks on Eielson AFB. The GBI silos, Interceptor Receiving and Process Building, and the Interceptor Storage Facility would all require the establishment of ESQDs. The establishment of the ESQDs would go through DOD review to ensure there are no incompatible health and safety issues. All of the proposed ESQDs associated with GBI deployment would fall within the base boundary; therefore, an explosion of the GBI within the hardened facilities should not pose a public health and safety risk. None of the proposed GBI facilities would fall within hazardous military operation areas on the Yukon Training Area. During construction, there is a low-potential for contact with some small arms ammunition and 40-millimeter practice grenades. Neither of these should pose a high health and safety risk to construction workers.

Operation

During operation, the GBI field would be dormant except for the occasional maintenance activities. See section 4.3.1.6 for a general overview of GBI health and safety issues. Most of the GBI activities would occur on the Yukon Training Area; however, because of the close proximity of Eielson AFB, this installation would provide some logistical support such as fire response and use of the airfield. The Eielson Fire Department is adequate to handle the installation and operation of the GBI element and provide fire fighting support. None of the Army or Air Force training exercises would conflict with the operation of the GBI or present an incompatible health and safety issue. The potential for an aircraft mishap to occur over the GBI field and impact the missile field is considered remote. The main Air Force impact areas and training areas are east of the proposed sites.

Any GBI mishap that would result in a solid propellant fire could generate hazardous air pollutants. As discussed above, at no time would it be expected that peak hydrogen chloride (the toxic constituent of main concern of burning solid propellants) emission levels would exceed public exposure guidelines.

As discussed above, the potential for a liquid propellant leak is remote; however, if a liquid propellant leak were to occur, there is the potential for health hazard from the gases. As discussed above, the hazardous extent of the cloud could exceed the OSHA PEL up to 760 meters (2,493 feet) from the leak for nitrogen tetroxide. The most likely areas for this to occur would be within the Interceptor Receiving and Inspection Facility, the Interceptor Storage Facility, and at the GBI missile field. The hazardous emission from the GBI site would not affect any areas outside of the base boundary and would not include the administrative areas on Eielson AFB; therefore, there would be minimal public health and safety risk.

Within the last 50 years, 11 fires of 40.5 hectares (100 acres) or more have occurred on the Yukon Training Area; therefore, the potential exists that forest fires could occur near the proposed GBI element location. As part of standard fire fighting practices on the Yukon Training Area, fire breaks would be built around any proposed NMD element. The current fire protection status at the proposed GBI sites is Full Protection, which are areas that receive maximum detection coverage and immediate and aggressive initial attack response. For either proposed GBI element site, the fire protection status would have to be changed to Critical Protection, which are lands that receive maximum detection coverage and are of the highest priorities for attack response. This status along with the appropriate fire breaks and fire equipment should limit the potential for forest fires spreading into the GBI element areas on the Yukon Training Area.

For the GBI site operation, a health and safety plan would be prepared that would include procedures to handle emergencies involving the GBI. This plan would describe how to handle each type of emergency, the appropriate base and off-base contacts, and an evacuation plan, if necessary.

The operation of the GBI element on Eielson AFB is addressed under the Yukon Training Area, where most of the operations would occur. The main health and safety risks at Eielson AFB would be associated with GBI transportation from the base to the deployment site on the Yukon Training Area. As addressed above, the potential for a mishap during transportation of the GBI is considered remote; therefore, there would be minimal increase in health and safety risk at Eielson AFB.

Cumulative Impacts

Potential cumulative health and safety impacts are not expected to occur at the Yukon Training Area with the combination of GBI deployment activities and ongoing health and safety risk from current military activities. No new or future programs are planned that could add to potential cumulative impacts. The main cumulative impacts could come

from an increase in fires or a combination of hazardous activities increasing the health and safety risk.

Deployment of the GBI would not increase the potential for forest fires on the Yukon Training Area. Most GBI activities would occur within facilities or areas cleared of nearby vegetation. Any fire resulting from an accident in GBI operation should not result in a forest fire; therefore, there would be no increased health and safety risk from fires. The change in the fire status (see mitigation measures below) would reduce the potential for fires to impact the GBI deployment site.

Although there is the potential for aircraft mishaps to occur in the airspace over the GBI deployment area, the likelihood of an aircraft mishap to occur on the entire Yukon Training Area is considered remote, and even less of a probability to occur directly over the proposed GBI site. The area of the proposed GBI deployment site is outside of the main hazardous aircraft overflight and weapon delivery areas.

Overall, it is not expected that GBI deployment and operation at the Yukon Training Area would cause a significant increase in the health and safety risk when combined with other ongoing programs. Potential deployment of the BMC2 in combination with the GBI would not represent any cumulative health and safety risks.

Potential cumulative health and safety impacts at Eielson AFB could occur with the combination of GBI deployment activities and ongoing health and safety risk from current military activities. No new or future programs are planned that could add to potential cumulative impacts. The main cumulative impacts could come from increased health and safety risks from transportation of the GBI if it conflicts with other ongoing hazardous activities on Eielson AFB. Given the short transportation distance on Eielson AFB, the low potential for a transportation mishap, and the safety procedures that would be in place, there would be minimal increase in health and safety risk in combination with other ongoing programs.

Mitigation Measures

To reduce the potential for forest fires affecting the proposed GBI element site, the fire protection status would need to be changed from Full Protection to Critical Protection. The Critical Protection status would give the site the highest level of fire fighting protection provided by the Bureau of Land Management Alaska Fire Service. The U.S. Army would need to coordinate this revision with the Alaska Fire Service.

Mutual aid agreements with local fire departments would need to be updated to inform them of the additional hazards and safety considerations of GBI deployment.

4.3.1.6.2 North Dakota Installations

4.3.1.6.2.1 Grand Forks AFB—Health and Safety

Construction

The GBI silos, the Interceptor Receiving and Process Building, and the Interceptor Storage Facility would all require the establishment of ESQDs at both proposed sites (Weapons Storage Area and OT-5) at Grand Forks AFB. The establishment of the ESQDs would go through DOD review to ensure there are no incompatible health and safety issues. All of the proposed ESQDs associated with GBI deployment on Grand Forks AFB would fall within the base boundary; therefore, an explosion of the GBI within the hardened facilities should not pose a public health and safety risk. Neither of the potential GBI locations on Grand Forks AFB falls within the aircraft clear zones or EMR safety zones on Grand Forks AFB; therefore, there would be no conflicts with existing safety hazards. Most of the munitions have been removed from the Grand Forks AFB Weapons Storage Area.

Operation

During operation, the GBI field would be dormant except for the occasional maintenance activities. See section 4.3.1.6 for a general overview of GBI health and safety issues. The Grand Forks AFB Fire Department is adequate to handle the installation and operation of the GBI element and provide fire fighting support. In addition, Grand Forks AFB has a long history of safely handling and transporting solid propellant missiles (Minuteman missiles) throughout the North Dakota area. During the time of Minuteman deployment, no serious accidents occurred that resulted in ignition of the missile.

Any GBI mishap that would result in a solid propellant fire could generate hazardous air pollutants. As discussed above, at no time would it be expected that peak hydrogen chloride (the toxic constituent of main concern of burning solid propellants) emission levels would exceed public exposure guidelines.

As discussed above, the potential for a liquid propellant leak is remote; however, if a liquid propellant leak were to occur within the GBI area on Grand Forks AFB, there is the potential for health hazard from the gases. As discussed above, the hazardous extent of the cloud could exceed the OSHA PEL up to 760 meters (2,493 feet) from the leak for nitrogen tetroxide. However, the anticipated level of exposure to nitrogen tetroxide in this area would only be expected to be mildly irritating to the eyes and nose and could include coughing. No irreversible damage would be expected from exposure at these levels. The most likely areas for a spill to occur would be within the Interceptor Receiving and Inspection

Facility, the Interceptor Storage Facility, and at the GBI missile field. Hazardous emission from a propellant leak at the Grand Forks Weapons Storage Area GBI deployment alternative could affect up to 107 hectares (264 acres) off-base. This area includes open land, three commercial buildings, two churches, one residential unit, and portions of Highway 2. A spill of the nitrogen tetroxide could affect these public facilities. If a spill were to occur, this area would be evacuated by emergency response personnel. On-base, the hazardous emission area from a spill of liquid propellant would include the family housing area, administrative, and flightline facilities.

For the OT-5 GBI deployment alternative at Grand Forks AFB, approximately 306 hectares (757 acres) could be affected off-base. This area has one residential unit, with the remainder of the area open farm land; any spill would require a search of the area so any of the public could be evacuated from the open farm land and the one residential unit. On-base, the hazardous emission area from a spill of liquid propellant would only include the alert apron area. Overall, given the limited buffer to occupied areas both on-base and off-base, there is a greater health risk from GBI operations at Grand Forks AFB compared to other GBI deployment alternatives.

For the GBI site operation, a health and safety plan would be prepared that would include procedures to handle emergencies involving the GBI. This plan would describe how to handle each type of emergency, the appropriate on-base and off-base contacts, and a evacuation plan, if necessary.

Cumulative Impacts

Potential cumulative health and safety impacts are not expected to occur at Grand Forks AFB with the combination of GBI deployment activities and ongoing health and safety risk from current military activities. The recent deactivation of the Minuteman III missiles around Grand Forks AFB has reduced the health and safety risk. Other potential projects in the future do not add any additional military or regional activities that would pose a cumulative health risk along with GBI deployment. Potential deployment of the BMC2 in combination with the GBI would not represent any cumulative health and safety risks.

Although there is the potential for aircraft mishaps to occur in the airspace over the GBI deployment area on Grand Forks AFB due to the close proximity to the airfield, the likelihood of an aircraft mishap to occur is considered remote. In addition, both potential GBI deployment sites on Grand Forks AFB are outside of the approach and departure clear zones.

Overall, it is not expected that GBI deployment and operation at Grand Forks AFB would cause a significant increase in the health and safety risk when combined with other ongoing and future programs.

Mitigation Measures

Mutual aid agreements with local fire departments would need to be updated to inform them of the additional hazards and safety considerations of GBI deployment.

4.3.1.6.2.2 Missile Site Radar—Health and Safety

Construction

The GBI silos, the Interceptor Receiving and Process Building, and the Interceptor Storage Facility would all require the establishment of ESQDs at the Missile Site Radar. The establishment of the ESQDs would go through DOD review to ensure there are no incompatible health and safety issues. The proposed ESQDs associated with GBI deployment would exceed the base boundaries on the Missile Site Radar; however, no inhabited structures currently exist within this area. Therefore, an explosion of the GBI should not pose a public health and safety risk. The government would need to review the existing lease agreements at the Missile Site Radar to determine if any additions or modifications would be required.

Operation

During operation, the GBI field would be dormant except for the occasional maintenance activities. As part of GBI deployment at this location, a fire department would be built to meet the requirements of the facility. In addition, the current mutual aid agreements with the local fire departments would be maintained and modifications made to take into account the additional hazards of GBI deployment.

Any GBI mishap that would result in a solid propellant fire could generate hazardous air pollutants. As discussed above, at no time would it be expected that peak hydrogen chloride (the toxic constituent of main concern of burning solid propellants) emission levels would exceed public exposure guidelines.

As discussed above, the potential for a liquid propellant leak is remote; however, if a liquid propellant leak were to occur within the GBI area on the Missile Site Radar, there is the potential for health hazard from the gases. As discussed above, the hazardous extent of the cloud could exceed the OSHA PEL up to 760 meters (2,493 feet) from the leak for nitrogen tetroxide. However, the anticipated level of exposure to nitrogen tetroxide in this area would only be expected to be mildly irritating to the eyes and nose, and could include coughing. No

irreversible damage would be expected from exposure at these levels. The most likely areas for a spill to occur would be within the Interceptor Receiving and Inspection Facility, the Interceptor Storage Facility, and at the GBI missile field. Hazardous emission from a propellant leak at the Missile Site Radar could affect up to 225 hectares (557 acres) off-base. This area is open or farmland; however, there is a commercial building and an unoccupied farm building within this area. A spill of the nitrogen tetroxide could affect these public facilities. If a spill were to occur, emergency response personnel would evacuate this area.

For the GBI site operation, a health and safety plan would be prepared that would include procedures to handle emergencies involving the GBI. This plan would describe how to handle each type of emergency, the appropriate base and off-base contacts, and an evacuation plan, if necessary.

Cumulative Impacts

The Missile Site Radar is currently inactive. The only other project that could represent the potential for cumulative impacts would be the potential dismantlement and destruction of some of the facilities at the Missile Site Radar. This activity would need to be mostly completed before the start of the main NMD construction activities. However, there is the potential that some construction activities may overlap. The combination of these two construction activities occurring at the same time could increase the risk to workers' health and safety. This increase in risk should be minimal since all activities would be conducted in accordance with appropriate health and safety regulations and activities would be similar to any large construction project. No other activities occur at the site or are planned at the site that could represent a cumulative impact with deployment of the GBI. No regional activities occur or are planned that would result in cumulative health and safety risks. Potential deployment of the BMC2 in combination with the GBI would not represent any cumulative health and safety risks.

Mitigation Measures

Currently, there are no inhabited structures within the up to 479-meter (1,570-foot) ESQDs that extend beyond the base boundary; however, the existing lease agreements would need to be reviewed and any additions or modifications made depending on the final ESQD requirements.

Mutual aid agreements with local fire departments would need to be updated to inform them of the additional hazards and safety considerations of GBI deployment.

4.3.1.7 Land Use and Aesthetics

This section addresses potential environmental impacts caused by changes to the land use or aesthetic environment due to the construction and operation of the GBI element. These impacts include potential effects from ongoing projects and activities at these sites. The following criteria were used to determine potential impacts:

- Construction of facilities or disturbance of land that may create conflicts with adjacent land use, zoning, or other planning regulations
- Compatibility with existing land use on and off-base
- Construction or operational activities that may affect the visual environment

4.3.1.7.1 Alaska Installations

Currently, there are no plans for components of the GBI to affect any off-base land uses in Alaska. However, requirements for additional elements such as the fiber optic cable line have not been determined. This fiber optic cable line would follow existing easements and rights of way, Proper easements would be obtained if crossing private land, and rights of way permits and/or lease disposals would be applied for if affecting state land.

4.3.1.7.1.1 Clear AFS—Land Use and Aesthetics

Construction

Under the Proposed Action, a GBI element would be constructed and become operational at one of the two alternative sites and existing activities discussed in the No-action Alternative for Clear AFS (section 4.2.8.1.1) would continue. As described under the No-action Alternative, adjacent land use and zoning is compatible with activities on Clear AFS. This is not expected to change because the construction, operation and safety zones of the GBI at either location would be well contained within the boundaries of Clear AFS.

Construction of the new facilities at Clear AFS would include a silo field, an Interceptor Receiving and Processing Building, an Interceptor Storage Building, some support facilities and an access road to the site. The proposed activity would take place at potential GBI site A, located southeast of the Technical Site close to the landfill, or at potential GBI site B, located just north of the Composite Area. Approximately 243 hectares (600 acres) of undisturbed land would be altered under either alternative to accommodate the new facilities, which is roughly 5 percent of the total base. The siting of the GBI field and support facilities would be in accordance with DOD standards taking into account ESQD and EMR

safety criteria. All of the construction areas fall well within the boundaries of Clear AFS and therefore have no conflicts with adjacent land uses or zoning, and there are no inhabited structures that fall within the construction areas or safety zones. Both proposed GBI sites are currently forested and used for recreation and open space. The proposed use at either location would be of an industrial nature but would not significantly alter the amount of open space or recreational areas and would be compatible with the military uses on-base.

In addition to the GBI facilities, construction of housing (dormitories) would be required on Clear AFS. This housing would be located adjacent to the existing base dormitories and just south of this area. The new dormitories would be compatible with the existing base land use (residential and open) in this area. There is also the potential for new administrative facilities to be located just north of the existing dormitories or in the Camp Site portion of the base.

The new construction would be of similar nature to the existing facilities. Due to the topography and the dense vegetation the visual sensitivity is very low. Public views are virtually nonexistent except for the occasional aircraft operations in the vicinity of Clear AFS. The silos do not extend above ground level, and the support facilities would not be out of character with the existing facilities on-base.

Operation

The GBI field would be in dormant state during the operation phase with the exception of occasional maintenance. There would be an up to 479-meter (1,570-foot) ESQD from the GBI field, Interceptor Receiving and Processing Building, and Interceptor Storage Building from any inhabited building. The ESQDs fall within forested areas on-base and are a compatible land use. They would not affect any of the existing facilities at Clear AFS or any of the surrounding land uses. There will be a small loss of land used for recreational activities and hunting by Air Force and civilian base personnel due to construction and operation of the Proposed Action.

Cumulative Impacts

Construction of the GBI and support facilities would occur on-base in an area designated for military use among several other facilities that were first built starting shortly after World War II. Construction of the Ballistic Missile Early Warning System began in 1958 for the purpose of detecting missiles launched at the United States. Other support facilities have also been constructed over the years. Currently the Solid State Phased-Array Radar is under construction. The GBI and support facilities would affect approximately 5 percent of the base and would increase the amount of developed land to around 8 percent of the 4,670 hectares (11,542 acres)

that make up Clear AFS. Because the area proposed for development is already designated for military use, no cumulative land use changes would occur. A BMC2 element of the NMD system could also be located at Clear AFS. This element would affect a very small portion of the base and would be contained within the acreage for the GBI element. The existing Ballistic Missile Early Warning System radar and the new radar are up to 50 meters (165 feet) tall and can not be seen from offsite locations; therefore, no aesthetic impacts are anticipated. The Proposed Action combined with current and previous activities do not combine to create any cumulative land use or aesthetic impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.1.7.1.2 Fort Greely—Land Use and Aesthetics

Construction

Under the Proposed Action, a GBI element could be constructed and become operational at Fort Greely. Existing and projected activities would continue as discussed in the No-action Alternative (section 4.2.8.1.4). As described under the No-action Alternative, adjacent land use and zoning is compatible with activities on Fort Greely. This is not expected to change because the construction, operation, and safety zones of the GBI would be well contained within the boundaries of Fort Greely.

Construction of the new facilities at Fort Greely would include a silo field, an Interceptor Receiving and Processing Building, an Interceptor Storage Building, some support facilities and access roads to the site. The proposed activity would take place south of the Main Cantonment Area in the Main Post Area in an area referred to as the Jarvis Site. This area is primarily used as a non-firing maneuver area, air drops, training, and troop maneuvers. Approximately 243 hectares (600 acres) of undisturbed land would be altered to accommodate the new facilities, which is small portion of the total land base of Fort Greely. The siting of the GBI field and support facilities would be in accordance with DOD standards taking into account ESQD and EMR safety criteria. All of the construction areas fall well within the boundaries of Fort Greely and therefore have no conflicts with adjacent land uses or zoning, and there are no inhabited structures within close proximity to the construction sites. Construction will impact the use of this area by the Army as a training area. However, this is a very small portion of the total land available at Fort Greely for training, and the impact of losing this small portion of the training area would be minimal.

The GBI element on Fort Greely may require the upgrading and resurfacing of the existing runway. This activity would not change any existing land uses or airfield safety zones and would be consistent with the current uses of this area.

The new construction would be of an industrial nature and would be similar to the existing military facilities. Due to the flat topography and the vegetation barriers from roadways, the visual sensitivity is very low. Public views are virtually nonexistent except for the occasional recreation users that may visit the areas. The silos do not extend above ground level, and the support facilities would not be out of character with the existing facilities on-base.

Operation

The GBI field would be in dormant state during the operation phase with the exception of occasional maintenance. There would be an up to 479-meter (1,570-foot) ESQD from the GBI field, Interceptor Receiving and Processing Building, and Interceptor Storage Building to any inhabited building. The ESQDs fall within the proposed site and are a compatible land use. They would not affect any of the existing facilities at Fort Greely or any of the surrounding land uses. There will be a small loss of land used for training activities, recreational activities, and hunting due to construction and operation of the Proposed Action.

Cumulative Impacts

Construction and operation of a GBI at Fort Greely would only affect a very small portion of the base compared to the overall size of Fort Greely and would create no zoning or land use conflicts. The potential area for deployment is designated for military use and is currently used to conduct military activities. Currently there are several projects planned along with most of the cantonment area being excessed. These projects and the potential reuse of the cantonment area are more thoroughly discussed in the No-action Alternative for Fort Greely (section 4.2.8.1.4). A BMC2 could also be constructed during the same time as the GBI. This would probably be located within the proposed GBI site or within an existing facility in the cantonment area. The GBI or BMC2 may require the use of some facilities in the cantonment area for housing, administrative, or maintenance-related purposes. However, this would not conflict with other potential reuses including the proposed correctional facility within the cantonment area. No other projects have been identified by Fort Greely that would contribute to cumulative land use or aesthetic impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.1.7.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Land Use and Aesthetics

Construction

Under the Proposed Action, a GBI element could be constructed and become operational at Yukon Training Area/Eielson AFB. Existing and projected activities would continue as discussed in the No-action Alternative (sections 4.2.8.1.3 and 4.2.8.1.5). As described under the No-action Alternative, adjacent land use and zoning is compatible with activities on Yukon Training Area/Eielson AFB except for in the small community of Moose Creek just to the northwest of Eielson AFB. Construction, operation and the safety zones of the GBI would be well contained within the boundaries of the Yukon Training Area and would not have any effect on the Moose Creek community or have any conflicts with any other adjacent land uses or zoning. There are no inhabited structures within close proximity to the proposed construction site.

Construction of the new facilities at Yukon Training Area/Eielson AFB would include the GBI silos, an Interceptor Receiving and Processing Building, an Interceptor Storage Building, some support facilities, and an access road to the site. The proposed activity would occur in the western portion of the Yukon Training Area just outside the Eielson AFB boundary in a wooded area called Winter Camp. Approximately 243 hectares (600 acres) of land in this area of the Yukon Training Area would be altered to accommodate the new facilities. The siting of the GBI field and support facilities would be in accordance with DOD standards taking into account ESQD and EMR safety criteria.

Portions of the proposed GBI site are currently used as a biathlon course, and Manchu Trail runs through this location. Depending on the final GBI siting for this location, use of portions of the biathlon course and Manchu Trail could be discontinued. However, there are other biathlon courses on the Yukon Training Area, and Manchu Trail is not considered a primary access road within the training area.

The new construction would be of similar nature to the existing military facilities on Eielson AFB. Due to the topography and the isolation of the site, visual sensitivity is very low. Public views are virtually nonexistent except for the occasional recreation users that may visit the areas. The silos do not extend above ground level, and the support facilities would not be out of character with the existing facilities on-base.

Operation

The GBI field would be in dormant state during the operation phase with the exception of occasional maintenance. There would be an up to 479-meter (1,570-foot) ESQD from the GBI field, Interceptor Receiving and

Processing Building, and Interceptor Storage Building to any inhabited building. The ESQDs fall within proposed site and are a compatible land use with everything except the biathlon course and the road. No other land uses or facilities would be affected. There will be a small loss of land used for training activities, recreational activities and hunting due to construction and operation of the Proposed Action.

Cumulative Impacts

Construction and operation of the GBI and support facilities at Yukon Training Area/Eielson AFB would affect a large tract of land currently designated for military use, but one that is small in comparison to the remainder of the Yukon Training Area. This activity would create no zoning or land use conflicts. Currently, several projects are planned, which are discussed in sections 4.2.8.1.3 and 4.2.8.1.5 of the No-action Alternative. A BMC2 could also be constructed during the same time as the GBI. The BMC2 is NMD-related and would more than likely occur within the GBI site. Because the NMD program would not change the military use of the area, no cumulative land use changes would occur. In addition, this project in conjunction with the other planned projects discussed in the No-action sections would not combine to create any cumulative land use impacts. No other projects have been identified for the Yukon Training Area or Eielson AFB that could contribute to cumulative land use or aesthetic impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.1.7.2 North Dakota Installations

Currently, there are no plans for components of the GBI to affect any off-base land uses in North Dakota. However, requirements for additional elements such as the fiber optic cable line have not been determined. This fiber optic cable line would follow existing easements and rights of way, and additional easements and rights of way would be obtained if necessary.

4.3.1.7.2.1 Grand Forks AFB—Land Use and Aesthetics

Construction

Under the Proposed Action, the GBI missile fields and support facilities could be constructed in one of two locations and on-base activities would continue as normal. These two locations are on-base, and the GBI element could be located at either the Weapons Storage Area or the OT-5. As stated in the No-action Alternative, adjacent land use and zoning is compatible with existing activities on Grand Forks AFB. This is not anticipated to change because all construction, operation, and safety

zones related to the GBI and support facilities would be well contained within the confines of the base boundary.

Construction of new facilities at the Weapons Storage Area on Grand Forks AFB would include a silo field, an Interceptor Receiving and Processing Building, and other support facilities. Other buildings would be modified or demolished to accommodate new facilities, and some existing facilities may be used to support the GBI. In one option, the majority of activity would occur in the extreme southwest portion of the base. Approximately 162 hectares (400 acres) of land would be required to accommodate the new facilities, which is just over 7 percent of the total base. This land has been previously disturbed by the construction of the Weapons Storage Area, and some buildings would have to be removed to accommodate the new construction. Others could be modified to house the support facilities. All new construction activity would occur within the boundaries of the base and would not create any zoning or land use conflicts.

Construction for the other option at the OT-5 site would be virtually the same as the Weapons Storage Area site. The only difference is the OT-5 site is currently open space, whereas the Weapons Storage Area site has existing structures that would have to be removed.

New construction of the silos would not extend above ground level, and the support facilities are typical of the existing structures on-base. Due to the flatness of the topography and lack of prominent vistas, the visual sensitivity would be considered low. Public views of Grand Forks AFB are limited to traffic on Highway 2 and CR 3B.

Operation

The GBI field would remain in a dormant state except for occasional maintenance activities. There would be an up to 479-meter (1,570-foot) ESQD from the GBI missile field, Interceptor Receiving and Processing Building, and Interceptor Storage Building that would not allow inhabited structures within this perimeter. The ESQDs at either of the sites would fall within the boundaries of the base. The OT-5 site is currently open space and is a compatible land use. The Weapons Storage Area is currently used for weapons storage. Some of the structures may be modified, and the rest will be demolished. The land around the Weapons Storage Area is open with the exception of a couple of parking lots that would fall into the ESQD perimeter and is a compatible land use.

Cumulative Impacts

Construction and operation of the GBI and support facilities would occur on-base among several other facilities that were started in 1956. The GBI and support facilities would only affect a small portion of the base on

land already designated for military use. A BMC2 could also be constructed during the same time as the GBI and would require 604 square meters (6,500 square feet). Other construction projects and programs mentioned in the Grand Forks AFB No-action Cumulative Impacts section 4.2.8.2.2 in conjunction with these potential projects are not expected to create any cumulative land use or aesthetic impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.1.7.2.2 Missile Site Radar—Land Use and Aesthetics

Construction

Under the Proposed Action, the GBI field and support facilities would be constructed and become operational, and the current inactivity and mission of the Missile Site Radar would change to support the new GBI and related facilities. As described in the No-action Alternative (section 4.2.8.2.3), all adjacent land around the Missile Site Radar has no zoning conflicts or incompatible land uses. The construction and operation of the GBI is not expected to change this. However, the safety zones for the GBI field and support facilities will fall just outside the boundaries of the base onto private farmland. Existing permanent safety restriction easements are in place on some of the surrounding property outside the Missile Site Radar boundary. Depending on final siting criteria for the GBI element, these safety easements will be reviewed and modified as necessary.

Construction of the new facilities at the Missile Site Radar would include a silo field, an Interceptor Receiving and Processing Building, an Interceptor Storage Building, new housing, and various other support facilities. The proposed activity would take place on the majority of the site, affecting 170 hectares (420 acres) of previously disturbed land. Most of the existing facilities would be removed before construction of the new ones. The siting of the missile field and support facilities would be in accordance with DOD standards taking into account ESQD and EMR safety criteria. All of the construction would take place within the boundaries of the Missile Site Radar and would not create any land use or zoning conflicts. There are currently no inhabited structures in close proximity to the construction site.

New construction would be of similar nature to the existing facilities. Due to the flatness of the topography and lack of prominent vistas the visual sensitivity would be considered low. Public views are limited to the town of Nekoma, traffic on Highway 1, CR 26 and CR 66. The silos would not extend above ground level, and the support facilities are typical of the existing structures.

Operation

The GBI field would be in a dormant state during the operation phase with the occasional exception of maintenance activities. There would be an up to 479-meter (1,570-foot) ESQD from the GBI field, Interceptor Receiving and Processing Building, and Interceptor Storage Building that would not allow inhabited structures within this perimeter. The majority of the ESQDs fall within the base boundary and would encompass some of the existing facilities. However, these facilities would be removed or remain unoccupied and therefore would be compatible with the ESQDs. Portions of the ESQDs fall on to private land; however, this land is currently used for agricultural purposes and is a compatible land use. The ESQDs would not limit the use of this land for farming.

Cumulative Impacts

Construction and operation of the GBI and support facilities would occur on-base among several other existing facilities and would replace some structures on-base that would be demolished or already have been removed. Construction of the Missile Site Radar was completed in October 1974. Between December 1975 and 1977 all of the missiles had been removed. The base has remained inactive and in a caretaker status since that time. The GBI and support facilities would affect the majority of the base. However, the entire site has previously been disturbed, and it will not affect any lands that were previously undisturbed. A BMC2 could also be constructed during the same time as the GBI and would require 604 square meters (6,500 square feet). This NMD element would be included with the GBI construction and would not contribute to cumulative land use or aesthetic impacts. No other future programs have been identified, and no previous activities combine to create any cumulative land use or aesthetic impacts.

Mitigation Measures

Additional land agreements with adjacent landowners within the ESQD may need to be obtained as necessary depending on the final siting criteria and review of existing permanent safety restrictive easements already in place. No other mitigation measures would be required.

4.3.1.8 Noise

This section addresses the potential impacts to the noise environment due to the construction and operation of the GBI element. During the construction phase, the sources of noise would be construction equipment and construction-related traffic. During the operational phase, the sources of noise would include only operational-related traffic.

The nature of the construction noise would be the same at each of the potential GBI sites, and thus is discussed below. Site-specific analysis will focus on the potential impacts of construction noise and the specific traffic at each site.

As discussed in section 3.10, the following criteria are used to determine potential impacts to the noise environment:

- Traffic noise levels incompatible with the Federal Highway Administration's Noise Abatement Criteria (table 3.10-4)
- Long-term noise levels incompatible with DOD Land Use Compatibility for Noise guidelines (table 3.10-3)
- Short-term noise greater than 85 dBA

As in section 3.10, traffic noise is calculated using the methodology from the Federal Highway Administration Highway Traffic Noise Prediction Model (U.S. Federal Highway Administration, 1978). Peak hourly traffic counts were assumed to be 12 percent of the average annual daily traffic count used. The traffic mixes used were the same ones used in the Transportation resource sections. For divided highways, the traffic was evenly divided between the two directions.

The analysis in this section is concerned with human receptors; noise effects on wildlife are discussed under Biological Resources.

Construction

With one exception, noise from construction equipment usually falls in the range of 70 dBA to 98 dBA at 15 meters (50 feet) from the source, with earth moving equipment, jack hammers, and rock drills being the noisiest pieces of equipment in this range. (U.S. EPA, 1971—Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances). The one exception is pile drivers, which fall in the range of 95 dBA to 106 dBA at 15 meters (50 feet). Under current planning, pile drivers would be expected to be used for the GBI at the Alaska sites, but not at the North Dakota sites. It should be noted that noise from portable generators used during construction, which usually falls in the range of approximately 70 dBA to 80 dBA at 15 meters (50 feet), is included in the description of noise from construction equipment given above.

Under the National Research Council's Guidelines for Preparing Environmental Impact Statements on Noise (1977) changes to the noise environment that last more than 6 months, but less than 10 years, are categorized as long-term temporary changes. The National Research Council recommends that the potential noise impacts from such projects require more analysis than, for example, potential impacts from short-term construction, but less than impacts from projects potentially causing permanent changes to the noise environment. Therefore, it is appropriate to estimate the locations of the DNL equals 65 dBA and DNL equals 75 dBA contours that would potentially be generated for GBI construction.

Ignoring the effects of terrain and atmospheric attenuation, noise attenuates by 6 dBA for each doubling of distance. For distances of greater than approximately 300 meters (1,000 feet) the effects of atmospheric attenuation start to become important. While atmospheric attenuation is frequency dependent (Cowan, 1994—Handbook of Environmental Acoustics), for purposes of analysis an average non-frequency dependent value of 1 dBA per 304.8 meters (1,000 feet) is used.

To calculate the locations of the DNL equals 65 dBA and DNL equals 75 dBA contours for GBI construction, the hours of operations and the 10 dBA penalty for noise occurring between 10 p.m. and 7 a.m. must be taken into account. For the purpose of analysis, it is assumed that construction at the Alaska sites will take place 24 hours per day during the summer months. Therefore, due to the 10 dBA penalty added to nighttime noise, for the Alaska sites the DNL equals 65 dBA and DNL equals 75 dBA contours are estimated to occur within approximately 1.9 kilometers (1.2 miles) and approximately 0.87 kilometer (0.54 mile) from the construction site, respectively.

For the purpose of analysis, it is assumed that GBI construction at the North Dakota sites will occur at all times except the nighttime hours between 10 p.m. and 7 a.m. Furthermore, consistent with the discussion in section 3.10, average nighttime noise levels are assumed to not exceed 55 dBA. Consequently, for the North Dakota sites the DNL equals 65 dBA and DNL equals 75 dBA contours are estimated to occur within approximately 0.55 kilometer (0.34 mile) and within approximately 0.16 kilometer (0.10 mile) from the construction site, respectively.

During the actual construction of the GBI the DNL equals 65 dBA and DNL equals 75 dBA contours would likely occur closer to the construction site than the estimates given above, due to the conservative assumptions used in the calculations:

- The noisiest pieces of construction equipment would be operated during all hours of construction

- The noisiest pieces of equipment would be operated at the outside edge of the construction site (almost certainly not the case for the pile driver)
- No attenuation of noise due to terrain
- No attenuation of noise due to intervening structures

4.3.1.8.1 Alaska Installations

With respect to traffic noise, all the potential Alaska sites for the GBI have some similarities. As discussed in section 4.3.1.10.1, during the peak of construction a large number of construction personnel would travel to and from the GBI construction site, thus adding to the daily traffic count. It is expected that the construction personnel would be divided into shifts, and thus would not all arrive and leave at the same time. This traffic increase would last approximately 5 years, with the peak occurring during the first 2 years of construction. For the purpose of analysis, for construction, the total was added to the daily traffic count for each roadway examined. This was done in addition to any other anticipated site-specific changes in traffic count. The specific number of workers, and resulting additional trips per day, are given below under each proposed GBI site.

The estimated changes to the traffic count during GBI operation are site specific, and are noted below; however, there is the potential for the BMC2 to be collocated with the GBI at each of the sites. It is currently estimated that 30 personnel would be needed for the operation of the BMC2. Consequently, under cumulative impacts for all sites, in addition to site-specific changes, 60 is added to the operation traffic count for each roadway examined.

As all areas potentially affected by traffic noise are expected to be of Activity Category B with respect to the Federal Highway Administration's Noise Abatement Criteria (table 3.10-4), only the distances to the location of $L_{eq(1\ hour)}$ equals 67 dBA were estimated. The estimated distances to $L_{eq(1\ hour)}$ equals 67 dBA for the four segments of Alaskan roadway examined are summarized in table 4.3.1.8-1.

The right of way for all four segments of roadway examined is approximately 91 meters (300 feet) from the centerline of the road (Fantazzi, 1999—Electronic communication). As the locations of $L_{eq(1\ hour)}$ equals 67 dBA would be expected to occur within the right of way for all cases, no impacts from traffic noise would be expected to occur for the construction or operation of the GBI at any of the proposed sites.

Table 4.3.1.8-1: Estimated Traffic Noise for GBI Construction and Operation at Alaskan Sites

Roadway (Location)	Assumed Average Speed in Kilometers per Hour (Miles per Hour)	GBI Construction		GBI Operation		Cumulative Impacts GBI and BMC2 Operation	
		AADT	$L_{eq(1\ hour)}$ = 67 dBA in meters (feet)	AADT	$L_{eq(1\ hour)}$ = 67 dBA in meters (feet)	AADT	$L_{eq(1\ hour)}$ = 67 dBA in meters (feet)
George Parks Highway (Clear AFS)	105 (65)	3,211	42 (138)	2,521	35 (115)	2,581	36 (118)
Richardson Highway (Fort Greely)	89 (55)	982	13 (43)	1,102	13 (43)	2,362	22 (72)
Alaska Highway (Fort Greely)	72 (45)	2,582	18 (59)	2,702	19 (62)	3,962	24 (79)
Richardson Highway—divided highway (Eielson AFB)	89 (55)	5,830	35 (115)	5,486	33 (108)	5,517	33 (108)

Note: Based on the methodology of the U.S. Federal Highway Administration (1978).
AADT = annual average daily traffic, dBA = decibel A-weighted, Leq = equivalent sound level

4.3.1.8.1.1 Clear AFS—Noise

Construction

As no off-base noise sensitive receptors are known to exist within 1.9 kilometers (1.2 miles) of either alternative GBI construction site at Clear AFS, no impacts to the noise environment would be expected from construction equipment noise.

As discussed in section 4.3.1.10, up to approximately 1,200 vehicles per day would be expected to be added to the George Parks Highway during construction of the GBI. However, as shown in table 4.3.1.8-1, the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur well within the approximate 91-meter (300-foot) right of way. Consequently, no impacts from traffic noise during GBI construction would be expected.

Operation

As discussed in section 4.3.1.10, up to approximately 334 vehicles per day would be expected to be added to the George Parks Highway during operation of the GBI. However, as shown in table 4.3.1.8-1, the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur well within the approximate 91-meter (300-foot) right of way. Consequently, no impacts from traffic noise during GBI operation would be expected.

Cumulative Impacts

Potential cumulative impacts to the noise environment could occur at Clear AFS with the combination of GBI deployment activities and ongoing noise from current military activities.

As no off-base noise sensitive receptors have been identified in the vicinity of either potential deployment alternative, it would not be expected that GBI construction noise at Clear AFS would cause an impact to the noise environment when combined with the noise from other ongoing and future programs.

As discussed above and in section 4.3.1.10, up to approximately 60 additional vehicles per day could be expected to be added to the George Parks Highway during operation activities, if the BMC2 is chosen to be collocated with the GBI element at Clear AFS. However, as shown in table 4.3.1.8-1, under this condition the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur well within the approximate 91-meter (300-foot) right of way. Consequently, no cumulative impacts from traffic noise during GBI operation would be expected.

GBI deployment at Clear AFS is not expected to cause an impact to the noise environment when combined with other ongoing and future programs.

Mitigation Measures

No mitigation measures would be required.

4.3.1.8.1.2 Fort Greely—Noise

Construction

As no noise sensitive receptors are known to exist within 1.9 kilometers (1.2 miles) of the proposed GBI construction site at Fort Greely, no impacts to the noise environment would be expected from construction equipment noise.

As discussed in section 4.3.1.10, NMD construction activities would have a neutral effect on the area traffic volumes due to realignment activities at Fort Greely. Consequently, no impacts from traffic noise during the GBI construction are expected.

Operation

As discussed in section 4.3.1.10, up to approximately 720 vehicles per day would be expected to be added to the Richardson and Alaska Highways during operation of the GBI element. However, Fort Greely is currently undergoing realignment activities that will reduce personnel

numbers from 750 to 66 by July 2001. This reduction will leave a net decrease in the traffic volume on-base and in the surrounding area. Consequently, no impacts from traffic noise during GBI operation would be expected.

Cumulative Impacts

Potential cumulative impacts to the noise environment could occur at Fort Greely with the combination of GBI deployment activities and ongoing noise from current military activities.

As no noise sensitive receptors have been identified in the vicinity of the construction site, it would not be expected that GBI construction noise at Fort Greely would cause an impact to the noise environment when combined with the noise from other ongoing and future programs.

As mentioned above, Fort Greely is undergoing realignment. The Reuse Plan for Fort Greely consists of two alternatives that would result in a generation of 30 to 600 jobs, depending on which alternative was chosen (Delta/Greely Community Coalition, 1998—Final Reuse Plan, Fort Greely). Also, there is a potential that the BMC2 element could be chosen to be collocated with the GBI element at Fort Greely. This would increase the number of vehicles per day on the Richardson and Alaska Highways by 60.

The net effect of realignment, reuse, and NMD activities on Fort Greely would be an increase of 306 persons from the total employment before realignment. This employment increase would cause the traffic volumes on-base and in the area to increase accordingly. However, as shown in table 4.3.1.8-1, the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur well within the approximate 91-meter (300-foot) right of way. Consequently, no impacts from traffic noise are expected.

Mitigation Measures

No mitigation measures would be required.

4.3.1.8.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Noise

Construction

As no noise sensitive receptors are known to exist within 1.9 kilometers (1.2 miles) of the proposed GBI construction site in the Yukon Training Area, no impacts to the noise environment would be expected from construction equipment noise.

As discussed in section 4.3.1.10, up to approximately 1,200 vehicles per day would be expected to be added to the Richardson Highway during construction of the GBI. However, as shown in table 4.3.1.8-1, the

location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur well within the approximate 91-meter (300-foot) right of way. Consequently, no impacts from traffic noise during GBI construction would be expected.

Operation

As discussed in section 4.3.1.10, up to approximately 510 vehicles per day would be expected to be added to the Richardson Highway during operation of the GBI. However, as shown in table 4.3.1.8-1, the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur well within the approximate 91-meter (300-foot) right of way. Consequently, no impacts from traffic noise during GBI operation would be expected.

Cumulative Impacts

Potential cumulative impacts to the noise environment could occur in the Yukon Training Area/Eielson AFB area with the combination of GBI deployment activities and ongoing noise from current military activities.

As no noise sensitive receptors have been identified in the vicinity of the construction site, it would not be expected that GBI construction noise would cause an impact to the noise environment when combined with the noise from other ongoing and future programs.

As discussed above and in section 4.3.1.10, up to approximately 60 additional vehicles per day could be expected to be added to the Richardson Highway during operation activities, if the BMC2 is chosen to be collocated with the GBI element in the Yukon Training Area. However, as shown in table 4.3.1.8-1, under this condition the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur well within the approximate 91-meter (300-foot) right of way. Consequently, no cumulative impacts from traffic noise during GBI operation would be expected.

GBI deployment at the Yukon Training Area/Eielson AFB is not expected to cause an impact to the noise environment when combined with other ongoing and future programs.

Mitigation Measures

No mitigation measures would be required.

4.3.1.8.2 North Dakota Installations

As all areas potentially affected by traffic noise are expected to be of Activity Category B with respect to the Federal Highway Administration's Noise Abatement Criteria (table 3.10-4), only the distances to the location of $L_{eq(1\ hour)}$ equals 67 dBA were estimated. The estimated distances to $L_{eq(1\ hour)}$ equals 67 dBA for the six segments of roadway in North Dakota examined are summarized in table 4.3.1.8-2.

Table 4.3.1.8-2: Estimated Traffic Noise for GBI Construction and Operation at North Dakota Sites

Roadway (Location)	Assumed Average Speed in kilometers per hour (miles per hour)	GBI Construction		GBI Operation		Cumulative Impacts GBI and BMC2 Operation	
		AADT	$L_{eq(1\ hour)}$ = 67 dBA in meters (feet)	AADT	$L_{eq(1\ hour)}$ = 67 dBA in meters (feet)	AADT	$L_{eq(1\ hour)}$ = 67 dBA in meters (feet)
CR 3B (Grand Forks AFB)	89 (55)	8,000	46 (152)	7,510	33 (108)	7,570	33 (108)
U.S. 2—divided highway (Grand Forks AFB main gate)	105 (65)	5,750	48 (157)	5,506	35 (115)	5,536	35 (115)
U.S. 2—divided highway (Grand Forks AFB secondary gate)	105 (65)	3,450	34 (112)	3,206	25 (82)	3,236	25 (82)
CR 26 (MSR)	89 (55)	1,430	15 (49)	900	8 (26)	960	8 (26)
ND 1 (MSR)	105 (65)	1,850	21 (69)	1,320	13 (43)	1,380	13 (43)
ND 66 (MSR)	105 (65)	1,530	19 (62)	1,000	11 (36)	1,060	11 (36)

Note: Based on the methodology of the U.S. Federal Highway Administration (1978).
AADT = annual average daily traffic, dBA = decibels A-weighted, Leq = equivalent sound level

The right of way for North Dakota county roads (denoted by CR) and state roads (denoted by ND) are 23 meters (75 feet) and 30 meters (100 feet) from the centerline (Papacek, 1999—Personal communication). U.S. 2 in North Dakota has a total right of way of approximately 91 meters (300 feet). For all the roadways except CR 3B at Grand Forks AFB, the locations of $L_{eq(1\ hour)}$ equals 67 dBA would be expected to occur within the right of way.

4.3.1.8.2.1 Grand Forks AFB—Noise

Construction

Under the Proposed Action, the GBI missile fields and support facilities could be constructed in one of two locations at Grand Forks AFB, the Weapons Storage Area or the OT-5. OT-5 is located in the southwestern portion of Grand Forks AFB. As noted in section 3.10, a residential unit located approximately 0.5 kilometer (0.3 mile) west of the base's southwest boundary. Therefore, for GBI construction at the OT-5, this house may lie within the DNL equals 65 dBA contour.

The Weapons Storage Area is located in the southeastern portion of Grand Forks AFB. As noted in section 3.10, two churches, a residential unit, and a portion of Emerado incorporated land is located within approximately 0.5 kilometer (0.3 mile) of the base's southeast corner. Therefore, for GBI construction at the Weapons Storage Area, these buildings may lie within the DNL equals 65 dBA contour.

As noted in guidance given in table 3.10-3, for DNLs between 65 dBA and 75 dBA the Army categorizes land use as normally unacceptable for residences. Consequently, depending on the details of the final site layout, the potential for a negative impact to the noise environment exists for the construction of the GBI at Grand Forks AFB. However, due to the conservative assumptions used to estimate the location of the DNL equals 65 dBA contour, and due to the temporary nature of the noise, any impacts would be expected to be minor.

As discussed in section 4.3.1.10, during the peak of construction it is currently estimated that approximately 500 construction personnel would travel to and from either potential GBI construction site at Grand Forks AFB, thus adding up to 1,000 to the daily traffic count. It is expected that the construction personnel would be divided into shifts, and thus would not all arrive and leave at the same time. This traffic increase would last approximately 5 years, with the peak occurring during the first 2 years of construction. For the purpose of analysis, for construction, the total 1,000 was added to the daily traffic count for CR 3B near the base's main gate, U.S. 2 at the base's main gate, and U.S. 2 at the base's secondary gate. Because U.S. 2 is a divided highway, 500 was added in each direction.

As shown in table 4.3.1.8-2, for the segment of U.S. 2 near the base's secondary gate, the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur within the roadway's right of way. For the segment of CR 3B near the base's main gate, the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur outside the roadway's right of way and approximately 15 meters (50 feet) further out from the road than the estimated current location of the $L_{eq(1\ hour)}$ equals 67 dBA at 31 meters (102 feet). Similarly, for the segment of U.S. 2 near the base's main gate, the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur outside the roadway's right of way and approximately 14 meters (45 feet) further out from the road than the estimated current location of the $L_{eq(1\ hour)}$ equals 67 dBA at 34 meters (112 feet). Therefore, the potential exists for areas outside of the rights of way along the segments of CR 3B and U.S. 2 near Grand Fork AFB's main gate to be exposed to noise levels in excess of the Federal Highway Administration Noise Abatement Criteria during GBI construction.

Current and planned buildings located in such an area may not qualify for Federal mortgage insurance without additional costs associated with installing extra noise attenuation. Receptors that would potentially be exposed include two churches, a residential unit, and a portion of Emerado incorporated land that are located within approximately 0.5 kilometer (0.3 mile) of the base's southeast corner.

Operation

As discussed in section 4.3.1.10, during operation it is currently estimated that approximately 255 personnel would travel to and from either potential GBI site at Grand Forks AFB, thus adding up to 510 to the daily traffic count. It is expected that the operational personnel would be divided into shifts, and thus would not all arrive and leave at the same time. For the purpose of analysis, for operation, the total 510 was added to the daily traffic count for CR 3B near the base's main gate, U.S. 2 at the base's main gate, and U.S. 2 at the base's secondary gate. Because U.S. 2 is a divided highway, 255 was added in each direction.

As shown in table 4.3.1.8-2, for both segments of U.S. 2, the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur within the roadway's right of way. For the segment of CR 3B near the base's main gate, the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur outside the roadway's right of way; however, it is estimated to occur only approximately 2 meter (7 feet) further out from the road than the estimated current location of the $L_{eq(1\ hour)}$ equals 67 dBA at 31 meters (102 feet). Furthermore, noise levels along CR 3B would not be perceptibly louder than current levels. Consequently, no impacts from traffic noise during GBI operation would be expected.

Cumulative Impacts

Potential cumulative impacts to the noise environment could occur at Grand Forks AFB with the combination of GBI deployment activities and ongoing noise from current military activities.

Other than the residences identified above that are in the vicinity of the construction site, it would not be expected that GBI construction noise would cause any impact to the noise environment when combined with the noise from other ongoing and future programs. For the reasons noted above, impacts to the residences would be expect to be minor.

As discussed in section 4.3.1.10, up to approximately 60 additional vehicles per day could be expected to be added to the daily traffic count for CR 3B near the base's main gate, U.S. 2 at the base's main gate, and U.S. 2 at the base's secondary gate during operation activities, if the BMC2 is chosen to be collocated with the GBI element at Grand Forks AFB. As shown in table 4.3.1.8-2, under both conditions the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur within the right of way for both segments of U.S. 2.

Similar to the analysis for traffic noise during the operation of only the GBI, for the segment of CR 3B near the base's main gate, the location of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur outside the roadway's right of way; however, it is again estimated to occur only approximately 2

meters (7 feet) further out from the road than the estimated current location of $L_{eq(1\ hour)}$ equals 67 dBA at approximately 31 meters (102 feet). As before, noise levels along CR 3B would not be perceptibly louder than current levels (see table 3.10-1). Therefore, as for the operation of the GBI alone, no impacts from traffic noise during GBI operation would be expected.

GBI deployment at Grand Forks AFB is not expected to cause an impact to the noise environment when combined with other ongoing and future programs.

Mitigation Measures

No mitigation measures are expected to be required for noise from construction equipment; however, mitigation measures could be taken to minimize the impacts from construction noise to the residences near the construction sites. These could include designing the final layout of the site so as to minimize the time that the noisiest construction equipment would spend on the part of the construction site nearest the residences and erecting a temporary noise barrier along the side of the construction site nearest the residences.

Due to the temporary impact of the traffic noise during construction, no mitigation measures are expected to be required. However, mitigation measures could be taken to minimize the impacts from traffic noise during construction to areas along the segments of CR 3B and U.S. 2 near Grand Fork AFB's main gate. These could include requiring all construction personnel traffic to flow through the secondary gate, since the analysis indicates no impact in that case. However, impacts may still occur for the segment of U.S. 2 near the base's main gate as all the construction personnel traffic may still traverse that roadway. Another possible mitigation measure would be to require carpooling or using vans to transport construction personnel from the city of Grand Forks to the construction sites.

4.3.1.8.2.2 Missile Site Radar—Noise

Construction

Two residences are located within approximately 0.3 kilometer (0.2 mile) of the western boundary of the Missile Site Radar. They are therefore potentially within the DNL equals 65 dBA contour, which is estimated to occur within 0.55 kilometer (0.34 mile) of the proposed GBI construction site, but outside the DNL equals 75 dBA contour, which is estimated to occur within 0.16 kilometer (0.10 mile).

As noted in guidance given in table 3.10-3, for DNLs between 65 dBA and 75 dBA the Army categorizes land use as normally unacceptable for residences. Consequently, depending on the details of the final site

layout, the potential for a negative impact to the noise environment exists for the construction of the GBI at the Missile Site Radar. However, due to the conservative assumptions used to estimate the location of the DNL equals 65 dBA contour, and due to the temporary nature of the noise, any impacts would be expected to be minor.

As discussed in section 4.3.1.10, up to approximately 1,250 vehicles per day would be expected to be added to CR 26, ND 1, and ND 66 in the vicinity of the Missile Site Radar during construction of the GBI. However, as shown in table 4.3.1.8-2, the locations of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during GBI construction would be expected.

Operation

As discussed in section 4.3.1.10, up to approximately 720 vehicles per day would be expected to be added to CR 26, ND 1, and ND 66 in the vicinity of the Missile Site Radar during operation of the GBI. However, as shown in table 4.3.1.8-2, the locations of $L_{eq(1\ hour)}$ equals 67 dBA are estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during GBI operation would be expected.

Cumulative Impacts

The only other project that could contribute to noise-related impacts would be the potential dismantlement and destruction of some of the facilities at the Missile Site Radar. This activity would need to be mostly completed before the start of the NMD activities. The main noise source from the dismantlement and destruction activities would result from the demolition of facilities. Demolition could require the use of explosive that may generate loud noise levels. However, it is expected that the demolition activities would be completed before the start of NMD construction for safety reasons. The only anticipated overlapping activities would be the use of heavy construction equipment. Other than the two residences identified above in the vicinity of the construction site that may experience noise above guidance levels, it would be expected that the overall construction noise from the combination of these programs would be short-term and would not result in any long-term cumulative impacts. It is expected that any cumulative transportation-related noise on the local roadways would be short-term during the time these two programs could be in progress. No other programs have been identified within the region that would result in cumulative noise-related operations impacts at the Missile Site Radar including other NMD elements, such as the XBR, that could be located in the region.

Mitigation Measures

No mitigation measures are expected to be required; however, mitigation measures could be taken to minimize the impacts from construction noise to the two residences west of the site. These could include designing the final layout of the site to minimize the time that the noisiest construction equipment would spend near the western edge of the site and erecting a temporary noise barrier along the western side of the construction site.

4.3.1.9 Socioeconomics

The analysis of the socioeconomic consequences of the alternative actions considers how they might impact the population, employment, housing, education, health, and the fiscal wellbeing of the local communities. The following criteria were used to evaluate possible positive and negative impacts of the action:

- The increase in the local population arising from the in-migration of construction and operational personnel and their families
- The amount of money spent in the local economy on construction materials for the action
- The amount of "new" money spent in the local economy on consumption goods by construction and operational personnel
- The number of jobs created in the local economy as a result of the "multiplier" effect
- The number of additional houses, hospital beds, and school places in the ROI required to meet the needs of the in-migrating construction and operational personnel and their families
- The amount of additional taxes of various kinds paid to the local communities of the ROI by the in-migrating construction and operational personnel

For the purposes of this socioeconomic analysis, the Proposed Action would have two phases likely to result in impacts; first, the construction phase and second, the operational phase. This analysis assumes that the operational phase immediately follows the construction phase.

4.3.1.9.1 Alaska Installations

4.3.1.9.1.1 Clear AFS—Socioeconomics

Construction of the facilities required to operate the GBI would take approximately 5 years, employing, on average, 400 construction workers a year. It would be expected that the majority of the construction workers would move to the area on a temporary basis from outside the region. Fairbanks, the nearest community of any size, had just over 1,800 construction employees in 1996 (U.S. Bureau of the Census, 1998—1996 County Business Patterns for Fairbanks, Alaska) but, with this exception, there is no local pool of labor on which to call for this type of project.

The operational phase of the GBI would directly employ up to 255 personnel, mostly joining the project from outside the region.

Population

Construction. A study of the economic impacts of a major missile site construction program (North Dakota State University, 1976—The Impact of the Safeguard Antiballistic Missile System Construction on North Dakota) cited several population impacts. Primarily, it was found that about 70 percent of the construction workers relocated to the area from elsewhere in the United States. If 70 percent of the construction workers for the GBI came from outside the area, then 120 workers would come from the local labor pool. Experience of other construction projects at Clear AFS suggests that the local labor pool of construction workers (defined as those currently living within the ROI and Fairbanks) would support this ratio of local workers to in-comers.

While a project of this scale might be expected to attract dependents, as well as the construction workers themselves, the isolation and distance of Clear AFS from main population centers, the lack of available housing and other facilities, and the experience of other construction projects at Clear AFS would suggest that the ratio of dependents to workers would be very low.

Operation. Given the specificity of the skills required for the operational phase, almost all those involved would move to Clear AFS from outside of the area.

Clear AFS is classified a remote base; therefore, dependents would not normally accompany the workforce, all of whom would be encouraged to live at Clear AFS rather than in the surrounding community or in Fairbanks.

Employment Income and Retail Impacts

Construction. The GBI construction program would generate additional income in the local economy in two ways. The first is in the form of wages earned by the construction workers. A proportion of these wages would be spent locally on lodging, food and transportation. Second, the construction program would include a proportion of locally purchased materials. These purchases, at local stores and from local suppliers, would generate additional income and jobs within the local economy.

A recent draft EIS completed within the ROI stated that "every $1 million in construction contract expenditures in Alaska generally results in the generation of 10 annual, average jobs (non-contract jobs)" (U.S. Department of the Interior, 1997—Northern Intertie Project Draft EIS). The construction cost of the GBI and its support facilities would be approximately $611 million over a 5-year period, or an average of $122 million per year. At least half this cost, however, would include high value equipment, manufactured and assembled at locations throughout

the United States, the purchase of which would have no local economic impact.

If the job multiplier factor, referred to in the Intertie EIS, was applied in this case, the approximately $60 million of local expenditure per year would generate 600 annual, average non-contract jobs. Many of these jobs would disappear with the completion of the 5-year construction program, making their economic benefits transitory. The majority would be created in the main urban centers of Fairbanks and Anchorage.

The impact of construction program expenditures on retailers would be almost entirely concentrated in Fairbanks, as there are few retail outlets in Denali Borough and Nenana.

Operation. The 255 personnel required to carry out the operational phase would generate at least $7.0 million of direct income per year. Although not all of this would be spent locally, it would be expected that the benefit of this income in the local community would have a multiplied effect. In other words, jobs, and the additional income they would generate, would be created indirectly in the community by the operational phase of the action. Using current economic impact data for Clear AFS, it is estimated that approximately 77 jobs would be generated indirectly by the operational phase of the action.

The majority of these jobs would be created in Fairbanks, the region's service center and only significant outlet for retail spending.

Impacts on Housing, Education, and Health

Construction. Most construction workers that have been involved in past projects at Clear AFS have been accommodated in local hotels or have commuted from Fairbanks. The Northstar Inn in Healy has 600 beds, while Fairbanks has over 100 bed and breakfast establishments and 30 hotels or motels. Temporary accommodation in the ROI, other than at these two locations, is strictly limited. Contractors and military personnel at Clear AFS are either encouraged or obliged to live on the base, and the surrounding communities do not have an established pool of temporary accommodation. While some short-term accommodation shortages could arise, it would be expected that the construction workforce would be adequately accommodated in Healy and, to a lesser extent, Fairbanks.

The existing health facility at Clear AFS is staffed to support the current personnel complement at Clear AFS. The construction program would more than double the daily workforce at Clear AFS during the peak summer months. As has been experienced at other DOD construction programs, it would be expected that the construction program would lead to an increase in industrial and traffic injuries, therefore placing an increased burden on the existing trained medical personnel in the area.

However, the major regional medical facilities in Fairbanks have adequate capacity to handle the increase in demand.

As outlined above, only a very small number of construction worker dependents are likely to live in the ROI. There would, therefore, be only a small additional enrollment in the local school districts as a result of the construction phase of the action. The additional enrollment would not have a significant effect on the resources of the local school district.

Operation. The 255 personnel required to carry out the operational phase of the program would require accommodation at Clear AFS. Existing dormitories are sufficient to accommodate only the current complement of personnel at Clear AFS. Additional dormitory space is planned to house the action's operational personnel.

Clear AFS has no family housing. Personnel relocating to Clear AFS with dependents would be required to house them in Anchorage or Fairbanks, as is currently the custom. Both communities would absorb the small number of dependents involved with minimal impact. Potential impacts to schools and medical facilities would be similar to those described under the construction phase.

Fiscal Impacts

Construction. The main fiscal impact arising from the construction phase would be as a result of the bed tax generated by construction workers staying at local hotels. Denali Borough would benefit fiscally due to the bed tax generated by the Northstar Inn. If all of the 280 construction workers estimated to require accommodation were to stay in Denali Borough, about $215,000 in bed taxes would be generated (based on the quoted room rate at the Northstar Inn). This would represent a 14 percent addition to the borough's tax revenue, based on 1997 returns. Sales taxes would also be generated at various locations throughout the ROI.

Negative fiscal impacts arising from construction activities would be limited to the potential for increased demands on the public safety services of fire, police, and ambulance.

Operation. The main positive fiscal impacts arising from the operational phase of the action would be reflected in an increase in sales tax collections. This would be the result of increased sales of goods and services by the influx of operational personnel.

Negative fiscal impacts, usually associated with increased education costs for the younger dependents of operational personnel, would be minimal because most would live and work at Clear AFS while their dependents lived elsewhere in the United States.

Cumulative Impacts

If the program for construction of the Solid-State Phased Array Radar, now in progress and started in Spring 1998, were extended, the various economic benefits outlined above would be magnified. There would also be increased pressure on lodging for construction workers.

In addition, the BMC2 could also be accommodated at Clear AFS, further adding to the positive economic benefits of the action.

There is one other major planned construction project in the area with a program that could overlap the action. The Northern Intertie Project has been programmed to begin in the winter of 1998, commencing in Fairbanks, and is planned to conclude in the Summer of 2000 from a staging area in Healy. The various economic benefits outlined above will be increased if the Northern Intertie Project is delayed and its overlapping period is extended.

The overlap, should it occur, would place additional pressure on accommodation for construction workers in Healy. Local labor shortages would magnify this problem by increasing the proportion of outside construction workers.

The operational phase of the action would be relatively self-contained. There are no other known projects to which the action would add socioeconomic impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.1.9.1.2 Fort Greely—Socioeconomics

Construction of GBI facilities would take approximately 5 years, employing, on average, 400 construction workers a year, with a maximum of 650 workers being employed at peak periods. It would be expected that the majority of the construction workers would move to the area on a temporary basis from outside the region. Fairbanks, the nearest community of any size, had just over 1,800 construction employees in 1996 (U.S. Bureau of the Census, 1998—1996 County Business Patterns for Fairbanks, Alaska) but, with this exception, there is no local pool of labor on which to call for this type of project.

The operational phase of the GBI would directly employ up to 360 personnel, mostly joining the project from outside the region.

Population

Construction. The population impacts of the construction phase of the project would be similar to those outlined for Clear AFS, above. If 70 percent of the construction workers for the GBI came from outside the area, then 120 workers would come from the local labor pool. Experience of previous construction and environmental projects at Fort Greely supports the view that the local labor pool of construction workers (defined as those currently living within the ROI and Fairbanks) would support this ratio of local workers to in-comers.

While a project of this scale might be expected to attract dependents, as well as the construction workers themselves, the distance of Fort Greely from main population centers, the lack of available housing and other facilities, and the experience of other construction projects at the base would suggest that the ratio of dependents to workers would be very low. Those bringing dependents with them for previous projects at Fort Greely have, typically, housed them in Fairbanks or Anchorage.

Operation. Given the specificity of the skills required for the operational phase, almost all those involved would move to Fort Greely from outside of the area.

It would be expected that few, if any, dependents would accompany the workforce, all of whom would be encouraged to live at Fort Greely rather than in the surrounding community or in Fairbanks.

Employment Income and Retail Impacts

Construction. The GBI construction program would generate additional income in the local economy in two ways. The first is in the form of wages earned by the construction workers. A proportion of these wages would be spent locally on lodging, food, and transportation. Second, the construction program would include a proportion of locally purchased materials. These purchases, at local stores and from local suppliers, would generate additional income and jobs within the local economy.

The construction cost of the GBI and its support facilities would be approximately $626 million over a 5-year period, or an average of $125 million per year. The higher cost at this site for construction is because of the runway resurfacing. At least half of the overall construction cost, however, would include high value equipment, manufactured and assembled at locations throughout the United States, the purchase of which would have no local economic impact. Applying the factor outlined above, about $62 million of annual construction expenditure would support an annual average 620 non-contract jobs. While some of these jobs might be created in the communities surrounding Fort Greely,

the majority would be in Fairbanks and Anchorage where much of the expenditure would be made.

The impact of construction program expenditures on retailers would be almost entirely concentrated in Fairbanks, as there are few retail outlets in the communities surrounding Fort Greely.

Operation. The operational phase of the GBI program would qualify as one of the preferred uses for this location, as stated in the Fort Greely Final Reuse Plan. The Plan has defined, as its preferred alternative, a mixed use industrial complex anchored by, among other activities, a military use which, as such, the GBI program would qualify. It is expected that the GBI element would result in approximately 360 direct jobs and would generate at least $9.7 million of direct income per year. It is estimated that approximately 108 jobs would be generated indirectly by the operational phase of the action.

The reuse plan assumes that a maximum of 66 DOD and civilian personnel would be located at Fort Greely. This group represents the residual complement, following realignment, and would carry out exercises and base maintenance and support. The 360 personnel required to operate the GBI would be in addition to this group, ensuring, therefore, that the military component exceeded the job assumptions contained in the reuse plan. The GBI program would improve the reuse plan's chances of success but would not entirely replace the personnel that have been posted elsewhere.

If the negative economic impacts of the realignment on the local economy are taken into account, the net economic effect of the GBI program, when added to the other components of the reuse plan, would be neutral. In other words, the GBI program would help restore the local economy to its pre-alignment condition, but would not expand it significantly beyond that point.

Impacts on Housing, Education, and Health

Construction. Most construction workers that have been involved in past projects at Fort Greely have been accommodated at the base or have commuted from Fairbanks. Some have found accommodation in the surrounding communities of Delta Junction and Big Delta. Fort Greely has an existing stock of accommodation, available as a result of the Base Realignment Plan. It would be expected that the construction workforce would be encouraged to live at Fort Greely during the program.

The existing health facility at Fort Greely would be the primary emergency care facility available to the construction program. The hospital network in Fairbanks would deal with the more serious and longer-term care needs of the construction workers, as they arise. As

noted in section 4.3.1.9.1.3, the medical facilities in Fairbanks are adequate to handle the increased demand.

As outlined above, only a very small number of construction worker dependents are likely to live in the ROI. There would, therefore, be only a small additional enrollment in the local school districts as a result of the construction phase of the action. The additional enrollment would not have a significant effect on the resources of the local school district.

Operation. The 360 personnel required to carry out the operational phase of the program would require accommodation at Fort Greely. Existing accommodation is sufficient to meet their needs. Impacts to medical facilities and schools would be similar to those described for the construction phase of the NMD program.

Fiscal Impacts

Construction. The main fiscal impact arising from the construction phase would be as a result of the bed tax generated by construction workers staying at hotels in Fairbanks. Delta Junction, the only municipality in the ROI with tax raising powers, does not levy a bed tax.

Negative fiscal impacts arising from construction activities would be limited to the potential for increased demands on the public safety services of fire, police, and ambulance.

Operation. The Proposed Action would make a significant contribution to mitigating the negative fiscal impacts of the realignment of Fort Greely. Sales taxes generated from the purchases made by personnel and their families would represent the main source of the fiscal benefits.

Negative fiscal impacts, usually associated with increased education costs for the younger dependents of operational personnel, would be minimal because most would live and work at Fort Greely while their dependents lived elsewhere in the United States.

Cumulative Impacts

The program to construct a new power line from the Richardson Highway to the Alascom Microwave Site would add to the positive economic impact if it overlapped with the Proposed Action. In addition, the BMC2 could also be accommodated at Fort Greely, further adding to the positive economic benefits of the action.

There are two further major planned projects in the area with programs that could overlap the action. The Northern Intertie Project has been programmed to begin in the winter of 1998, commencing in Fairbanks, and is planned to conclude in the Summer of 2000 from a staging area in Healy. The various economic benefits outlined above will be increased if

the Northern Intertie Project is delayed and its overlapping period is extended.

The Fort Greely Reuse Plan Preferred Alternative estimates that a maximum of 600 jobs could be created, should it be successfully implemented. If the reuse plan was successful in all its objectives and it achieved its maximum objective, the cumulative impact of the action would be to increase this estimate to 960 jobs. In this case, the successful implementation of the reuse plan plus the siting of the GBI at Fort Greely would have a positive cumulative economic impact that would mitigate the negative economic impact of the Base realignment.

Mitigation Measures

No mitigation measures would be required.

4.3.1.9.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Socioeconomics

Construction of the facilities required to operate the GBI would take approximately 5 years, employing, on average, 400 construction workers a year. It would be expected that the majority of the construction workers would move to the area on a temporary basis from outside the region. As an indication of the size of the local labor pool, Fairbanks, the nearest large community, had just over 1,800 construction employees in 1996 (U.S. Census of the Bureau, 1998—1996 County Business Patterns for Fairbanks, Alaska).

The operational phase of the GBI would directly employ up to 255 personnel, mostly joining the project from outside the region.

Population

Construction. If 70 percent of the construction workers for the GBI came from outside the area, then 120 workers would come from the local labor pool. Experience of other construction projects at Eielson AFB suggests that the local labor pool of construction workers (defined as those currently living within the ROI) would support this ratio of local workers to in-comers.

While a project of this scale might be expected to attract dependents, the experience of other construction projects at Eielson AFB would suggest that the ratio of dependents to workers would be very low.

Operation. Given the specificity of the skills required for the operational phase, almost all those involved would move to Eielson AFB from outside of the area.

If the operational personnel behaved in a similar manner to those already stationed at Eielson AFB, the workforce of 255 would be accompanied by a further 384 dependents, or 640 individuals in total.

Employment Income and Retail Impacts

Construction. The GBI construction program would generate additional income in the local economy in two ways. The first is in the form of wages earned by the construction workers. A proportion of these wages would be spent locally on lodging, food, and transportation. Second, the construction program would include a proportion of locally purchased materials. These purchases, from local suppliers, would generate additional income and jobs within the local economy.

A recent draft EIS completed within the ROI stated that "every $1 million in construction contract expenditures in Alaska generally results in the generation of 10 annual, average jobs (non-contract jobs)" (U.S. Department of the Interior, 1997—Northern Intertie Project Draft EIS). The construction cost of the GBI and its support facilities would be approximately $611 million over a 5-year period, or an average of $122 million per year. At least half this cost, however, would include high value equipment, manufactured and assembled at locations throughout the United States, the purchase of which would have no local economic impact. Applying the factor outlined above, $60 million of local expenditure would support an annual 600 average non-contract jobs. The majority of these jobs would be in the main urban centers where much of the expenditure would be made, including Fairbanks and Anchorage.

The impact of construction program expenditures on retailers would also be concentrated in Fairbanks and Anchorage.

Operation. The 255 personnel required to carry out the operational phase would generate at least $7.0 million of direct income per year. Although not all of this would be spent locally, it would be expected that the benefit of this income in the local community would have a multiplied effect. In other words, jobs, and the additional income they would generate, would be created indirectly in the community by the operational phase of the action. It is estimated that approximately 77 jobs would be generated indirectly by the operational phase of the action.

The majority of these jobs would be created in Fairbanks, the region's service center and only significant outlet for retail spending.

Impacts on Housing, Education, and Health

Construction. Most construction workers that have been involved in past projects at Eielson AFB have been accommodated in Fairbanks, where there are a number of bed and breakfasts as well as hotels and motels.

The existing health facility at Eielson AFB is staffed to support the current personnel complement at the base. The construction program would increase the daily workforce at Eielson AFB by about 15 percent during the peak summer months. As has been experienced at other DOD construction programs, it would be expected that the construction program would lead to an increase in industrial and traffic injuries, therefore placing an increased burden on the existing trained medical personnel in the area. However, the hospitals in the Fairbanks area are operating under-capacity and would be able to handle the increased demand for medical and social services from the less than 1 percent increase in population to the region from the NMD program.

As outlined above, only a very limited number of construction worker dependents are likely to live in the ROI. There would, therefore, be only a small additional enrollment in the local school districts as a result of the construction phase of the action. The additional enrollment would not have a significant effect on the resources of the local school district.

Operation. The 255 personnel required to carry out the operational phase of the program would be accommodated on either the base or in the wider community. The 1997 Fact Sheet for Eielson AFB (U.S. Air Force, 1999—Fact Sheet, Eielson AFB's 1997 Economic Impact) showed a slight surplus of on-base housing. If the operational personnel behaved in a similar manner to the existing manpower at Eielson AFB, about 174, plus their 244 dependents, would be expected to seek quarters on-base. The remaining 82, with their 115 dependents, would seek quarters off-base. However, depending on the conditions at Eielson AFB, no housing may be available during the timeframe of NMD deployment.

Eielson AFB has 1,500 family housing units. Personnel relocating to Eielson AFB with dependents would be also be able to house them in North Pole or Fairbanks, as is currently the custom. Both communities would absorb the number of dependents involved with relatively little impact.

As noted above under construction, the local medical facilities would be adequate to handle the increased demand from NMD operations. Between 130 and 180 of the dependents would be of school age. If the upper estimate of 180 new pupils was realized, this would represent an increase in the student roll of the Fairbanks Northstar school district of less than 1 percent and well within the existing school capacity.

Fiscal Impacts

Construction. The main fiscal impact arising from the construction phase would be as a result of the bed tax generated by construction workers staying at local hotels. If all of the 280 construction workers estimated to require accommodation were to stay in Fairbanks Borough, about

$245,000 in bed taxes would be generated per year (based on a quoted room rate of $30 per night, discounted because of bulk purchase). Sales taxes would also be generated at various locations throughout the ROI.

Negative fiscal impacts arising from construction activities would be limited to the potential for increased demands on the public safety services of fire, police, and ambulance.

Operation. The main positive fiscal impacts arising from the operational phase of the action would be reflected in an increase in sales tax collections. This would be the result of increased sales of goods and services by the influx of operational personnel.

Negative fiscal impacts would include increased education costs for the younger dependents of operational personnel.

Cumulative Impacts

An extensive program of construction projects at Eielson AFB is planned to begin in 1999 with the building of the Consolidated Munitions Facility. This will be followed by repair of the KC-135 Parking Ramp in 2000 and, most importantly, the repair of the Eielson AFB runway in 2000. These latter projects would add to the positive economic impacts of the construction phase of the action. They may also place pressure on the local supply of construction labor and lead to a greater number of workers moving to the area from outside the region. This in turn could increase the lodging requirements in the ROI.

Further building works programs will include construction of the Weapons and Release System Shop, the Transportation Heavy Maintenance Facility, Phase 2 of Supply Complex Vehicle Munitions Heated Parking, the HAZWASTE Collection Facility, and the All-Weather Family Wellness Center, all in 2001. These would further increase economic benefits to the region as well as place pressure on the local safety organizations for reasons outlined above.

The building works program will extend into 2002 with the construction of the Aircraft Support Equipment Facility, the Fuel Operations Facility, and the All-Weather Fitness Center. Cumulative positive impacts would diminish, as the construction phase of the Proposed Action would decrease in intensity through 2003.

The 2003 building works program, including construction of a Munitions Storage/Inspection Facility, a Munitions Assembly Facility, a Fabrication Flight Consolidation Facility, Security Lighting, and the Joint Deployment Processing Facility, would have some cumulative impact, along with the operational phase of the project.

Finally, the BMC2 would also be located at Eielson AFB, representing a further modest construction project that would add to positive cumulative impacts.

The operational phase of the GBI would be relatively self-contained. There are no other known projects to which the action would add long-term socioeconomic impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.1.9.2 North Dakota Installations

4.3.1.9.2.1 Grand Forks AFB—Socioeconomics

Construction of the facilities required to operate the GBI would take approximately 5 years, employing, on average, 250 construction workers a year, with a maximum of 500 workers employed at peaks in the schedule. It would be expected that the majority of the construction workers would move to the area on a temporary basis from outside the region. The existing local labor pool for construction workers expanded greatly in response to the 1997 flood of the Red River. There were 6,400 construction workers in Grand Forks County in 1997.

The operational phase of the GBI would directly employ up to 255 personnel, mostly joining the project from outside the region.

Population

Construction. A study of the economic impacts of a major missile site construction program (North Dakota State University, 1976—The Impact of the Safeguard Antiballistic Missile System Construction on North Dakota) cited several population impacts. Primarily, it was found that about 70 percent of the construction workers relocated to the area from elsewhere in the United States. If 70 percent of the construction workers for the GBI came from outside the area, then 75 workers would come from the local labor pool.

The North Dakota State University study also showed that a proportion of those construction workers relocating to the area brought their dependents with them. Each relocating worker brought 1.1 dependents with them. If this ratio were maintained for the Proposed Action, then it would be expected that 175 relocating construction workers would bring with them approximately 190 dependents, suggesting a total population impact of 365 persons. According to the study, about one in three of the dependents, or 62, would be of school age.

Operation. It would be expected that a certain proportion of the operational workers for the Proposed Action would bring their dependents with them, including some children of school age. It is assumed that there would be 384 dependents accompanying operational personnel, making 640 individuals in total.

Employment Income and Retail Impacts

Construction. The GBI construction program would generate additional income in the local economy in two ways. The first is in the form of wages earned by the construction workers. Some of these wages would be spent locally on lodging, food and transportation. Second, the construction program would include a proportion of locally purchased materials. These purchases, from local suppliers, would generate additional income and jobs within the local economy.

The construction cost of the GBI and its support facilities in North Dakota would be approximately $312 million over a 5-year period, or an average of $62 million per year. At least half this cost, however, would include high value equipment, manufactured and assembled at locations throughout the United States, the purchase of which would have no local economic impact. It is assumed therefore that the action would generate about $30 million of direct construction-related impacts in the local economy per year for 5 years.

This money would help create further jobs throughout the local economy, providing a trickle down or multiplier effect. It would be expected that approximately 300 annual, average non-contract jobs would be created in this manner.

Operation. The 255 personnel required to carry out the operational phase would generate at least $6.7 million of direct income per year. Although not all of this would be spent locally, it would be expected that the benefit of this income in the local community would have a multiplied effect. In other words, jobs, and the additional income they would generate, would be created indirectly in the community by the operational phase of the action. It is estimated that approximately 72 jobs would be generated indirectly by the operational phase of the action.

Impacts on Housing, Education and Health

Construction. Grand Forks has successfully accommodated a large contingent of construction workers during the Red River Flood rebuilding program. The construction phase of the action would commence as the Flood rebuilding program slows down. It would be expected that many of those involved in the Flood rebuilding program would become part of the construction phase workforce, continuing to live in their existing homes in Grand Forks.

New members of the construction workforce, and their dependents, would also be expected to live in and around Grand Forks. The existing vacant housing stock, increased in recent months by the post-Flood construction programs, would be sufficient to accommodate additional construction workers.

The construction workforce would bring dependents to Grand Forks, including up to 62 children of school age. If, as posited above, a proportion of the construction workers already lived in Grand Forks as a result of the Flood restoration program, their children would already be attending local schools. It is unlikely therefore that new school places would have to be found for all 62 children. The Grand Forks school system would have sufficient capacity to accommodate the number of children involved.

As the major center of population within the region, Grand Forks has a hospital and health system capable of supporting the needs of the construction workers and their dependents.

Operation. The operational staff compliment would be accommodated at Grand Forks AFB and in Grand Forks itself. Recent rebuilding of Grand Forks, following the Red River Flood, has generated a surplus of housing stock sufficient to accommodate operational workers.

The 120 operational worker dependents of school age would be absorbed by the Grand Forks and surrounding school systems with minimal disruption.

The local hospital facilities in Grand Forks and the clinic at Grand Forks AFB would meet the health needs of the operational staff.

Fiscal Impacts

Construction. The main fiscal impact arising from the construction phase would be as a result of sales tax generated on the purchases of construction workers, as well as the various materials purchased locally. Grand Forks has a sales and use tax of 6.75 percent. If the construction workforce earned a gross income of $11 million, it would be expected that about $5.28 million would be disposed on consumption goods on which the sales tax would be levied. Approximately $356,000 in sales taxes would, therefore, be generated each year of the construction program.

Negative fiscal impacts arising from construction activities would be limited to the potential for increased demands on the public safety services of fire, police, and ambulance.

Operation. The main positive fiscal impacts arising from the operational phase of the action would be reflected in an increase in sales tax collections. This would be the result of increased sales of goods and services by the influx of operational personnel.

Negative fiscal impacts, usually associated with increased education costs for the younger dependents of operational personnel, would be minimal because most would live and work at Grand Forks AFB while their dependents lived elsewhere in the United States.

Cumulative Impacts

Grand Forks AFB has several construction projects programmed between 2000 and 2004. In addition, flood control works at Devils Lake will also involve construction work over the coming years. Restoration works arising from the Red River flood damage are slated to end in 2002. A new commissary is planned for 2000 at Grand Forks AFB.

In addition, the BMC2 would also be located at Grand Forks AFB. Its modest construction program and small operational complement would add further to the positive economic impacts of the action.

The operational phase of the GBI would be relatively self-contained. There are no other known projects to which the action would add long-term socioeconomic impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.1.9.2.2 Missile Site Radar—Socioeconomics

Construction of the facilities required to operate the GBI would take approximately 5 years, employing, on average, 350 construction workers a year, with a maximum of 625 workers employed at peaks in the schedule. It would be expected that the majority of the construction workers would move to the area on a temporary basis from outside the region. The existing local labor pool for construction workers expanded greatly in response to the 1997 flood of the Red River. Job Service North Dakota showed that there were over 6,400 construction workers employed in Grand Forks in 1997 (Job Service North Dakota, 1998—Grand Forks Impact of Spring Flood 1997).

The operational phase of the GBI would directly employ up to 360 personnel, mostly joining the project from outside the region.

Population

Construction. A study of the economic impacts of a major missile site construction program (North Dakota State University, 1976—The Impact of the Safeguard Antiballistic Missile System Construction on North Dakota) cited several population impacts. Primarily, it was found that about 70 percent of the construction workers relocated to the area from elsewhere in the United States. If 70 percent of the construction workers for the GBI came from outside the area, then 105 workers would come from the local labor pool.

The North Dakota State University study also showed that a proportion of those construction workers relocating to the area brought their dependents with them. Each relocating worker brought 1.1 dependents with them. If this ratio were maintained for the Proposed Action, then it would be expected that 230 relocating construction workers would bring with them approximately 270 dependents, suggesting a total population impact of 515 persons. According to the study, about one in three of the dependents, or 90, would be of school age.

Operation. It would be expected that a certain proportion of the operational workers for the Proposed Action would bring their dependents with them, including some children of school age. It is assumed that there would be 540 dependents accompanying operational personnel, making 900 individuals in total.

Employment Income and Retail Impact

Construction. The GBI construction program would generate additional income in the local economy in two ways. The first is in the form of wages earned by the construction workers. Some of these wages would be spent locally on lodging, food, and transportation. Second, the construction program would include a proportion of locally purchased materials. These purchases, from local suppliers, would generate additional income and jobs within the local economy.

The construction cost of the GBI and its support facilities in North Dakota would be approximately $364 million over a 5-year period, or an average of $73 million per year. At least half this cost, however, would include high value equipment, manufactured and assembled at locations throughout the United States, the purchase of which would have no local economic impact. It is assumed therefore that the action would generate about $36 million of direct construction-related impacts in the local economy per year for 5 years.

This money would help create further jobs throughout the local economy, providing a trickle down or multiplier effect. It would be expected that approximately 360 annual, average non-contract jobs would be created in this manner.

Operation. The 360 personnel required to carry out the operational phase would generate approximately $9.1 million of direct income per year. Although not all of this would be spent locally, it would be expected that the benefit of this income in the local community would have a multiplied effect. In other words, jobs, and the additional income they would generate, would be created indirectly in the community by the operational phase of the action. This positive economic impact would be particularly beneficial to the communities of the ROI. Cavalier and Langdon have been declining in population and employment for over 30 years, and many of the retail services currently offered in these communities have become marginal. An influx of up to 360 households would help slow this demographic trend. It is estimated that approximately 100 jobs would be generated indirectly by the operational phase of the action.

Impacts on Housing, Education, and Health

Construction. The northeast corner of North Dakota has successfully accommodated a large contingent of construction workers during the Red River Flood rebuilding program. The construction phase of the action would commence as the Flood rebuilding program slows down. It would be expected that many of those involved in the Flood rebuilding program would become part of the construction phase workforce, continuing to live in their existing homes in Grand Forks.

New members of the construction workforce, and their dependents, would be expected to live in and around Grand Forks and in the ROI. The existing vacant housing stock, increased in recent months by the post-Flood construction programs, would be sufficient to accommodate additional construction workers. Between 1970 and 1973, Langdon and Cavalier almost doubled their populations in response to the Safeguard Missile construction program, which involved over 3,000 workers, plus their dependents. Many of the facilities constructed to mitigate the impacts of that program survive and could be re-activated if necessary.

The construction workforce would bring dependents to the ROI and Grand Forks, including up to 90 children of school age. If, as posited above, a proportion of the construction workers already lived in Grand Forks and the surrounding region as a result of the Flood restoration program, their children would already be attending local schools. It is unlikely therefore that new school places would have to be found for all 90 children. The regional school systems would have sufficient capacity to accommodate the number of children involved.

The nearest medical facilities available to the action are at Langdon and were upgraded in response to the Safeguard program. They have sufficient fixed capacity to meet the needs of construction workers, though they may require increased medical staff. As the major center of population within the region, Grand Forks has a hospital and health system capable of supporting the more fundamental medical needs of the construction workers and their dependents.

Operation. The operational staff compliment would be throughout the ROI. Recent rebuilding of Grand Forks, following the Red River Flood, has generated a surplus of housing stock. In addition, permanent and temporary accommodation could be found in the communities nearest to the action.

The 180 operational worker dependents of school age would be absorbed by the local school system with some additional staffing. The school at Langdon was increased in size to meet the needs of the Safeguard program. It has since required fewer and fewer facilities as a result of declining school rolls. This excess capacity would absorb the demand generated by the action, but would require additional staffing.

The local hospital facilities in Langdon would meet the health needs of the operational staff.

Fiscal Impacts

Construction. The main fiscal impact arising from the construction phase would be as a result of sales tax generated on the purchases of construction workers, as well as the various materials purchased locally. The ROI has a sales tax of 6 percent. If the construction workforce earned a gross income of $13.75 million, it would be expected that about $6.6 million would be disposed on consumption goods on which the sales tax would be levied. Approximately $396,000 in sales taxes would, therefore, be generated each year of the construction program.

Negative fiscal impacts arising from construction activities would be limited to the potential for increased demands on the public safety services of fire, police, and ambulance.

Operation. The main positive fiscal impacts arising from the operational phase of the action would be reflected in an increase in sales tax collections. This would be the result of increased sales of goods and services by the influx of operational personnel.

Negative fiscal impacts would arise from increased education costs for the younger dependents of operational personnel.

Cumulative Impacts

Flood control works at Devils Lake will also involve construction work over the coming years. Restoration works arising from the Red River flood damage are slated to end in 2002. These projects already contribute positive economic impacts to the region. The action would add further positive impacts from both construction and operation.

There is the potential for cumulative socioeconomic impacts to the area around the city of Langdon if a GBI is located at the Missile Site Radar and an XBR at one of the Remote Sprint Launch Sites. If this were to occur, a population and economic benefit to the region would be expected. In addition, there is the potential that some SRMSC dismantlement and destruction activities may occur during the initial phase of NMD construction. These potential cumulative increases would result in conditions slightly less than those experienced in the region during the Safeguard deployment. The region's infrastructure (utilities, schools, hospitals, and housing) would be sufficient to handle the potential cumulative socioeconomic impact.

4.3.1.10 Transportation

This section describes the potential environmental impacts caused by transportation activities associated with construction and operation of a GBI element. The following criteria were used to identify potential transportation impacts:

- A reduction in level of service by two or more level of service values
- A reduction in level of service that exceeds a level acceptable by state and local guidelines
- An increase in aircraft activity that would exceed the airport capacity

Prior to any NMD construction activity, a pre-road survey would be conducted of the roadways potentially impacted by NMD construction to determine the current condition. Upon completion of construction, an exit road survey would be conducted of these same roadways. The roadways will be repaired, if needed, to return them to pre-construction conditions.

4.3.1.10.1 Alaska Installations

4.3.1.10.1.1 Clear AFS—Transportation

Construction

Ground Transportation. Construction activities at Clear AFS would include new silos, support facilities, access road, and utility corridors to the proposed site. All installation traffic enters the base through one gate via the George Parks Highway. During the peak of construction, 600 construction personnel would pass through this gate an estimated two times per day. The off-base traffic volume on George Parks Highway and Anderson Road would also increase accordingly. However, it is expected that the construction personnel would be divided into shifts and that all 600 would not arrive at work at the same time. Also, once the new access road to the GBI site is completed, some construction personnel would use this road instead of the main gate. This traffic increase would last approximately 5 years, with the peak occurring during the first 2 years of construction. The level of service of the George Parks Highway is expected to change to LOS C. This change would be temporary and would return to LOS B once the construction phase was completed. There is no traffic information for Anderson Road or the gate at Clear AFS; however, no traffic problems exist now, and none are expected. No transportation impacts are expected due to NMD construction activities.

Air Transportation. Construction activities at Clear AFS would have no impact on air transportation or operations. Clear Airport would not be used to transport construction personnel or materiel to Clear AFS. Road transportation would be used.

Operation

Ground Transportation. Once the GBI site at Clear AFS becomes fully operational, the total employment would be 255. This number includes military, contractor positions, site maintenance, operations support, fire, and security personnel. Most of these personnel would live at Clear AFS; however, for analysis purposes each person is assumed to make two trips through the gate at Clear AFS for after-work activities. This would result in an increase of 510 trips per day at Clear AFS. Currently, Clear AFS is in the process of replacing its Ballistic Missile Early Warning System Radar with a Solid State Phased-Array Radar. When this is completed in fiscal year 2001, the station personnel will be reduced by 88, thus reducing the traffic volume. This reduction, combined with the increase due to NMD activities, would leave an increase of 334 trips through the gate at Clear AFS. Currently, there is no traffic data for the gate at Clear AFS or Anderson Road, but there are no traffic problems. An increase of 334 trips per day is not expected to create any problems with these roadways. The George Parks Highway is the primary road in the area, providing a link between Fairbanks and Anchorage. This roadway currently operates at LOS B in the vicinity of Clear AFS in the summer months, and the increase in traffic volume due to NMD activities would not change the level of service. No transportation impacts are expected on-base or in the vicinity of the installation.

Air Transportation. Operation activities would have no impact on air transportation or operations, since Clear Airport would not be used to transport the GBI canisters, or for routine operations. If Clear AFS is selected for GBI deployment, it is likely that the GBI canisters would be flown into Eielson AFB and transported over road or rail to Clear AFS. See section 4.3.1.10.1.3 for potential impacts from GBI aircraft operations at Eielson AFB. Clear Airport may be used for the occasional flight of personnel, similar to current activities for Clear AFS. Overall, there would be no impacts to current operations at Clear Airport.

Cumulative Impacts

Ground Transportation. Also proposed is the placement of a BMC2 element at Clear AFS. If this occurs, operations personnel would increase by 30. This small increase in traffic volume would not affect the level of service of any on-base or off-base roads within the vicinity of Clear AFS. The George Parks Highway experiences the highest traffic volume during the summer months, operating at LOS B. During construction, NMD activities are expected to change to LOS C; however,

once construction is completed the level of service would return to LOS B. No transportation cumulative impacts are anticipated for Clear AFS or the surrounding region.

Air Transportation. Since no impacts to air transportation are anticipated, no incremental, additive cumulative impacts are expected for Clear AFS.

Mitigation Measures

No mitigation measures would be required.

4.3.1.10.1.2 Fort Greely—Transportation

Construction

Ground Transportation. Construction activities at Fort Greely would include new silos, support facilities, access road upgrade, and utility installation. All installation traffic enters the base through one gate via the Richardson Highway.

Construction personnel at Fort Greely would total 650 during peak construction. In addition to on-base traffic volume increases, the off-base traffic on the Richardson Highway and Alaska Highway would also increase accordingly. However, it is expected that the family housing units at Fort Greely would be utilized for appropriate personnel assigned to the construction phase of this project. Also, it is expected that the construction personnel would be divided into shifts and all 650 would not arrive to work at the same time. For analysis purposes, it is estimated that 50 percent of the construction personnel would pass through the Fort Greely gate two times per day.

Also to be considered is the realignment of Fort Greely, which will result in an employment drop from 750 in 1997 to 66 by 2001. Since realignment would be complete before NMD construction activities, construction of the GBI at Fort Greely will have a neutral effect on traffic volumes on-base or in the area.

Air Transportation. If Allen Army Airfield is improved to support GBI deployment, it could possibly be used to support the last 2 to 3 years of construction activities. The airfield reconstruction effort (design and construction) would occur during the first 2 to 3 years of the 5-year NMD construction program. The number of potential construction-related airlift operations is undefined at this time. However, there would likely be less than 4 airlift operations per day or 1,460 per year. This would represent approximately 24 percent of the 6,000 airlift operations that occur at Allen Army Airfield each year. The 91 percent Fort Greely employment drop, due to base realignment by 2001, is expected to result in a decrease in airlift operations. This decrease in airlifts would be greater than the potential 24 percent increase in airlifts from NMD construction.

NMD airlift operations would therefore be expected to have no adverse impacts to air transportation or operations at Fort Greely.

Operation

Ground Transportation. Once fully operational, the GBI site at Fort Greely would have a total employment of 360 personnel, including military, contractor positions, site maintenance, operations support, and security personnel. This would result in an increase of 720 trips per day at Fort Greely, assuming that each person made two trips through the gate per day. Currently, Fort Greely is scheduled for realignment by 2001. This realignment would result in a decrease of approximately 700 personnel at the installation, therefore reducing the traffic volume on-base and in the vicinity of the base. Before realignment activities, the Richardson Highway in the vicinity of Fort Greely and the Alaska Highway in Delta Junction operated at LOS B. The net effect of realignment and NMD activities on Fort Greely and the surrounding area would be positive, with a decrease in traffic volume.

Air Transportation. Aircraft shipments would consist of the GBI canister being shipped by military or civilian cargo aircraft. After the initial deployment flights, approximately 20 airlift operations (10 flights to deployment base and 10 return flights) could be expected per year as part of routine maintenance. Compared to the 6,000 operations at Allen Army Airfield per year, this would represent a small percentage (0.3 percent), and would have no adverse impacts to air transportation or operations at Fort Greely. However, if the airfield is not improved for GBI deployment (reconstructed), Eielson AFB would be used, and equipment would be transported to Fort Greely by road.

Cumulative Impacts

Ground Transportation. The reuse plan for Fort Greely consists of two alternatives that would result in generation of 30 to 600 jobs, depending on which alternative was chosen (Delta/Greely Community Coalition, 1998—Final Reuse Plan, Fort Greely). Considering the decrease of personnel for the realignment, the subsequent increase from the reuse alternatives, and the increase due to NMD activities, the potential personnel at Fort Greely would be 1,056. This would be an increase of 306 persons from the total employment before realignment. The Richardson Highway at the Fort Greely gate is not expected to change from LOS B. However, the Alaska Highway at Delta Junction currently operates at LOS B but would change to LOS C with the increase. Currently, these roadways occasionally experience this change in level of service in the summer months due to tourism. There is no current traffic information for on-base roadways. However, with personnel being divided into shifts, no on-base traffic problem is expected.

Also proposed is the placement of a BMC2 element at Fort Greely. It is possible for this element to be chosen to coexist with the GBI element at Fort Greely. If this occurs, operations personnel would increase by 30. As mentioned above, the placement of the GBI element at Fort Greely would reduce the level of service for the Alaska Highway at Delta Junction to LOS C. The slight increase in traffic volume due to placing the BMC2 element at Fort Greely would not affect this level of service. The level of service for the Richardson Highway at the Fort Greely gate would remain at LOS B.

A few minor construction projects are scheduled for Fort Greely. Construction of new power lines from the Richardson Highway to the Alascom Microwave Site are planned. This activity would not change the level of service of the roadways in the area. No cumulative transportation impacts are expected at Fort Greely.

Air Transportation. Since no adverse impacts to air transportation are anticipated, no incremental, additive cumulative impacts are expected for Fort Greely.

Mitigation Measures

No mitigation measures would be required.

4.3.1.10.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Transportation

Construction

Ground Transportation. Construction activities on the Yukon Training Area would include new silos, support facilities, access road upgrade, and utility installation. Access to the Yukon Training Area is gained from the Richardson Highway at two points: through the main gate at Eielson AFB and via Johnson Road. However, due to the location of the NMD proposed site, only the gate at Eielson AFB would be used for NMD activities. During the peak of construction, 600 construction personnel would pass through this gate an estimated two times per day. This traffic increase would last approximately 5 years, with the peak occurring during the first 2 years of construction. Currently, the Richardson Highway in this area operates at LOS A. The increase in traffic volume due to NMD construction activities would not change this level of service. There is no traffic volume information for on-base roads for Eielson AFB. However, there are currently no traffic problems, and none are anticipated due to the proposed construction activities.

Air Transportation. Construction activities at the Yukon Training Area would have no impact on air transportation or operations, since Eielson AFB would not be used to transport construction personnel or materiel to the Yukon Training Area by aircraft. Road transportation would be used.

Operation

Ground Transportation. Once fully operational, the GBI site on the Yukon Training Area would have a total employment of 256, including military, contractor positions, site maintenance, operations support, fire, and security personnel. This would result in an increase of 512 trips per day on the Yukon Training Area, assuming that each person made 2 trips per day. Currently, the Richardson Highway in this area operates at LOS A. The increase in traffic volume due to NMD activities would not change this level of service. There is no traffic volume information for on-base roads for Eielson AFB. However, there are currently no traffic problems, and none are anticipated due to the proposed NMD activities.

Air Transportation. Aircraft shipments would consist of the GBI canister being shipped by military or civilian cargo aircraft. After the initial deployment flights, approximately 20 airlift operations (10 flights to deployment base and 10 return flights) could be expected per year as part of routine maintenance. Compared to the 59,000 operations at Eielson AFB per year, this would represent a small percentage (0.03 percent), and would have no adverse impacts to air transportation or operations at Eielson AFB.

Cumulative Impacts

Ground Transportation. Also proposed is the placement of a BMC2 element on the Yukon Training Area. It is possible for this element to be chosen to coexist with the GBI element at this location. If this occurs, operations personnel would increase by 30. This small increase in traffic volume would not change the level of service for any roadways in the area.

Eielson AFB has several construction activities planned from 2000-2003. The most significant is repair to the runway in 2000. These activities, NMD construction and operations activities, and a general increase on the Richardson Highway due to tourism have the possibility of reducing the level of service of this roadway to LOS B. Also, the gate at Eielson could become congested in the morning and afternoon as personnel arrive and leave work. This would be temporary, and after construction is over the level of service would return to LOS A for the Richardson Highway, and Hursey gate at Eielson AFB would return to normal. No cumulative transportation impacts are expected for the Yukon Training Area, Eielson AFB, or the surrounding area.

Air Transportation. Since no adverse impacts to air transportation are anticipated, no incremental, additive cumulative impacts are expected for Eielson AFB.

Mitigation Measures

No mitigation measures would be required.

4.3.1.10.2 North Dakota Installations

4.3.1.10.2.1 Grand Forks AFB—Transportation

Construction

Ground Transportation. Construction activities at Grand Forks AFB would include new silos, support facilities, access road, and utility installation. Access to Grand Forks AFB is provide by two gates: the main gate on CR 3B and the secondary gate on U.S. 2. During the peak of construction, 500 construction personnel would pass through one of these entrance points an estimate of two times per day. This traffic increase would last approximately 5 years, with the peak occurring during the first 2 years of construction. Currently, CR 3B at the main gate to Grand Forks AFB operates at LOS C, and U.S. 2 at the secondary gate operates at LOS A. It is expected that most construction traffic would enter and leave the base through the secondary gate. The increase in traffic volume due to NMD construction activities would not change the level of service on either of these roadways. There is no traffic volume information for on-base roads for Grand Forks AFB. However, there are currently no traffic problems, and none are anticipated due to the proposed construction activities.

Air Transportation. Construction activities at Grand Forks AFB would have no impact on air transportation or operations, since Grand Forks AFB would not be used to transport construction personnel or materiel to the GBI site by aircraft. Road transportation would be used.

Operation

Ground Transportation. Once fully operational, the GBI site at Grand Forks AFB would have a total employment of 255, including military, contractor positions, site maintenance, operations support, fire, and security personnel. This would result in an increase of 510 trips per day through one of the two gates on Grand Forks AFB, assuming that each of the personnel made 2 trips per day. This increase is not sufficient to change the level of service on CR 3B at the main gate from LOS C or the secondary gate on U.S. 2 from LOS A. There is no traffic volume information for on-base roads for Grand Forks AFB. However, there are currently no traffic problems, and none are anticipated due to the proposed NMD activities.

Air Transportation. Aircraft shipments would consist of one GBI canister being shipped by a military or civilian cargo aircraft. After the initial deployment flights, approximately 20 airlift operations (10 flights to

deployment base and 10 return flights) could be expected per year as part of routine maintenance. Compared to the 35,000 operations at Grand Forks AFB per year, this would represent a small percentage (0.06 percent), and would have no adverse impacts to air transportation or operations at Grand Forks AFB.

Cumulative Impacts

Ground Transportation. Also proposed is the placement of a BMC2 element at Grand Forks AFB. It is possible for this element to be chosen to coexist with the GBI element at this location. If this occurs, operations personnel would increase by 30. This slight increase in traffic volume would not change the level of service for any roadways in the area.

Grand Forks AFB has a few construction projects scheduled for 2000-2004. These activities consist of minor construction and would not affect the level of service of the roadways on-base or in the vicinity of the base. No cumulative transportation impacts are expected for Grand Forks AFB or the surrounding area.

Air Transportation. Since no adverse impacts to air transportation are anticipated, no incremental, additive cumulative impacts are expected for Grand Forks AFB.

Mitigation Measures

No mitigation measures would be required.

4.3.1.10.2.2 Missile Site Radar—Transportation

Construction

Ground Transportation. Construction activities at the Missile Site Radar would include new silos, support facilities, access road, and utility installation. All installation traffic enters the base through one gate via CR 26. During the peak of construction, 625 construction personnel would pass through this gate an estimated 2 times per day. The off-base traffic volume on CR 26, ND 1, and ND 66 in the vicinity of the installation would also increase accordingly. However, it is expected that the construction personnel would be divided into shifts, and all 625 would not arrive at work at the same time. This traffic increase would last approximately 5 years, with the peak occurring during the first 2 years of construction. The traffic volume increase would not change the current LOS A of any of these roadways. There is no traffic information for the gate at the Missile Site Radar since the installation is currently in a caretaker status. No transportation impacts are expected due to NMD construction activities.

Air Transportation. General aviation support for the Missile Site Radar would be provided by Grand Forks AFB. The potential construction impacts are discussed above in section 4.3.1.10.2.1.

Operation

Ground Transportation. Once fully operational, the GBI site at the Missile Site Radar would have a total employment of 360, including military, contractor positions, site maintenance, operations support, fire, and security personnel. This would result in an increase of 720 trips per day at the Missile Site Radar, assuming that each employee made two trips through the gate per day. Likewise, the traffic on surrounding roadways would increase. The increase in traffic volume would not be enough to change the level of service of CR 26, ND 1, or ND 66 from its present value of LOS A. There are no transportation impacts expected due to NMD activities.

Air Transportation. General aviation support for the Missile Site Radar would be provided by Grand Forks AFB. The potential operations impacts are discussed above in section 4.3.1.10.2.1.

Cumulative Impacts

Ground Transportation. Also proposed is the placement of a BMC2 element at the Missile Site Radar. It is possible for this element to be chosen to coexist with the GBI element at this location. If this occurs, operations personnel would increase by 30. This slight increase in traffic volume would not change the level of service for any roadways in the area.

It is possible that the BMC2 and GBI elements could be located at the Missile Site Radar and the XBR element located at either Remote Sprint Launch Site 1, 2, or 4. If this occurs, the traffic increase within the region would be greater due to the close proximity of the sites. However, this increase would not be enough to change the level of service on the roadways in the vicinity of the sites. The only roadways that could experience a change of level of service, LOS A to LOS B, would be ND 1 and ND 5 within Langdon, due to the centralized location of Langdon to the proposed sites. It is expected that Langdon will be the primary city utilized by the construction and operation workforce. The change of level of service for Langdon would occur during the construction phase of the NMD project and would return to LOS A once construction was completed. No change in the level of service would be experienced due to NMD operation activities.

The only other known project that could result in a cumulative impact would be the potential dismantlement and destruction of some facilities at the Missile Site Radar. The majority of this activity would need to be

completed before the start of the main NMD construction activities. There is the potential that some construction activities could overlap, subsequently increasing the amount of traffic within the area. The only roadways that could experience a change of level of service would be ND 1 and ND 5 within Langdon. This change to LOS B would be temporary and would return to LOS A upon completion of construction activities.

Air Transportation. General aviation support for the Missile Site Radar would be provided by Grand Forks AFB. The potential for cumulative operations impacts are discussed above in section 4.3.1.10.2.1.

Mitigation Measures

No mitigation measures would be required.

4.3.1.11 Utilities

This section provides an evaluation of system capacities and current and future service demands for the GBI element of the NMD program for four major public utilities including water supply, wastewater treatment, solid waste disposal, and energy. Under the Proposed Action, potential impacts to the utility systems would occur if it resulted in one or more of the following:

- The need for new utilities distribution facilities
- Shortages in public supply utility systems

If under-capacity scenarios exist for Proposed Action activities, the service short-fall and currently planned mitigations to augment existing capacity are identified. New utility demands from NMD project activities have been identified and are included quantitatively where specific data is available. The discussion of cumulative impacts and mitigations within this section generally includes planned projects and system additions that have been approved.

4.3.1.11.1 Alaska Installations

4.3.1.11.1.1 Clear AFS—Utilities

Under the GBI deployment at Clear AFS, utility usage would increase on the base and in the surrounding areas.

Water

An increase in water usage would occur both under construction and operation of the GBI. For construction, it is expected that most of the water increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. Construction worker-related water usage would be approximately 0.11 million liters per day (0.03 million gallons per day). The existing private wells in the surrounding ROI and the available capacity in Nenana of 0.409 million liters per day (0.108 million gallons per day) have sufficient capacity to handle this potential increase. On-base water usage from construction would be related to site watering and any required batch plants. The available capacity of 19.65 million liters per day (5.2 million gallons per day) would be sufficient to handle this increased demand.

Most of the operations-related water usage would occur on-base. New housing would be built for NMD operation workers on Clear AFS, which would tie into the existing base water supply. On-base water usage would be expected to increase by 0.048 million liters per day (0.013 million gallons per day), which is within the available base capacity of 19.65 million liters per day (5.2 million gallons per day). Off-base water

usage from operations is expected to be minimal since GBI-related personnel would stay on the installation. Since the proposed GBI facility would be located away from the existing base water system, new wells may be required. New wells and any proposed water system would be constructed and operated in accordance with local and state regulations and would be certified as required.

Wastewater

An increase in wastewater usage would occur both under construction and operation of the GBI. For construction, it is expected that most of the wastewater increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. Construction worker-related wastewater generation would be approximately 0.11 million liters per day (0.03 million gallons per day). The existing private septic and commercial wastewater systems in the surrounding ROI would have the available capacity to handle this temporary increase in demand. Portable wastewater facilities would be used for construction workers during the workday on Clear AFS.

Most of the operations-related wastewater generation would occur on-base. New housing would be built for NMD operations workers on Clear AFS, which would tie into the existing base wastewater supply. On-base wastewater generation would be expected to increase by 0.048 million liters per day (0.013 million gallons per day), which could be handled by the existing base leach field. It is likely that this increase in demand may shorten the leach fields current 10- to 20-year life span by 1 to 2 years over a 20-year period. Off-base wastewater generation from operations is expected to be minimal since GBI-related personnel would stay on the installation. Since the main GBI facilities would be located away from the existing wastewater system, a new septic wastewater facility would have to be constructed. The proposed new system would be constructed in accordance with local and state regulations and would be certified as required.

Solid Waste

Current estimates expect the Clear AFS landfill to reach capacity between 2008 and 2013. However, current plans are to close the landfill in 2002 or 2003 and utilize the new Denali Borough landfill. This landfill should have enough existing capacity for the increase in solid waste from the NMD program.

Electricity

Clear AFS has a 13.5-megawatt available electrical capacity from the current plant. In addition, the available capacity of the regional provider is approximately 90 megawatts. These available electrical capacities

would be sufficient to meet the demands of the GBI at Clear AFS. Individual backup generators would be provided for the GBI facilities.

Natural Gas

Natural gas is not used on Clear AFS.

Cumulative Impacts

No other future programs that could contribute to cumulative utility system impacts have been identified at Clear AFS or within the region. Analysis of the proposed operation of the new phased-array radar concluded that there would be no impacts to utility system integrity at Clear AFS. (U.S. Department of the Air Force, 1997—EA for Radar Upgrade at Clear AS, Alaska)

Mitigation Measures

No mitigation measures would be required.

4.3.1.11.1.2 Fort Greely—Utilities

Fort Greely is in the process of realigning. As a result of realignment activities there would be a reduction of personnel assigned to Fort Greely. According the Final Reuse Plan for Fort Greely, this would result in a reduction of approximately 700 jobs. This reduction would result in additional utility capacities in the ROI. GBI deployment would increase employment by approximately 360 personnel, which is only 51 percent of the anticipated reduction in jobs; therefore, there should be sufficient utility capacity in the ROI and on-base to handle NMD deployment. Reuse of the post area would could result in a slight increase in jobs at Fort Greely as when the base was fully operational.

Water

An increase in water usage would occur both under construction and operation of the GBI. For construction, it is expected that most of the water increase would occur on-base as a result of construction workers taking up temporary residence in existing facilities on Fort Greely. Construction worker-related water usage would be approximately 0.123 million liters per day (0.033 million gallons per day). The base water system, when all buildings were in use, had an available capacity of 3.01 million liters per day (0.80 million gallons per day). Thus, the existing water system at Fort Greely has sufficient available capacity for construction personnel and activities. Other on-base water usage from construction would be related to site watering and any required batch plants. The available capacity would be sufficient to handle this demand.

Most of the operations-related water usage would occur on-base. The existing base housing would be used for GBI operational personnel. On-base water usage would be expected to increase by 0.068 million liters per day (0.018 million gallons per day), based on the increase in operational personnel, which is within the available base capacity. Off-base water usage from operations is expected to be minimal since GBI-related personnel would stay on the installation. Since the proposed GBI facility would be located away from the existing base water system, new wells may be required. New wells and any proposed water system would be constructed and operated in accordance with local and state regulations and would be certified as required.

Wastewater

An increase in wastewater usage would occur both under construction and operation of the GBI. For construction, it is expected that most of the wastewater increase would occur on-base as a result of construction workers taking up temporary residence within existing facilities on Fort Greely. Construction worker-related wastewater generation would be approximately 0.123 million liters per day (0.033 million gallons per day). The wastewater system on the installation had an available capacity of 0.50 million liters per day (0.13 million gallons per day) when all buildings were in use. The increase in wastewater usage would be well within the available capacity. Portable wastewater facilities would be used for construction workers during the workday on Fort Greely.

Most of the operations-related wastewater generation would occur on-base. The existing base housing would be used for GBI operational personnel. On-base wastewater generation would be expected to increase by 0.068 million liters per day (0.018 million gallons per day), based on the increase in personnel for operation, which is within the available base capacity of 0.50 million liters per day (0.13 million gallons per day). Off-base wastewater generation from operations is expected to be minimal since GBI-related personnel would stay on the installation. Since the main GBI facilities would be located away from the existing wastewater system, a new septic wastewater facility would have to be constructed. The proposed new system would be constructed in accordance with local and state regulations and would be certified as required.

Solid Waste

Both the on-base landfill and off-base landfill in Delta Junction could be used for the NMD construction and operation phases. No determination has been made on whether the landfill on Fort Greely would remain open after base realignment. If the landfill remains open it would have sufficient capacity for NMD deployment or could be expanded. The off-base landfill has a 12-15 year life span and would be sufficient to meet

the needs of NMD. It would be expected that the landfill life span would be shortened by 1 to 2 years by the NMD program.

Electricity

Fort Greely obtains its power from Fort Wainwright and on-base generators. These systems were able to provide sufficient power to the installation when it was fully operational before realignment. The NMD program would require less power than when the base was operational; therefore there would be sufficient demand to meet the needs of GBI deployment. In addition, the available capacity of the regional provider is approximately 90 megawatts. Individual backup generators would be provided for the GBI facilities.

Natural Gas

There is no natural gas usage on Fort Greely.

Cumulative Impacts

Some additional new military construction is expected to occur on Fort Greely. The construction programs, which consist mostly of range upgrades to infrastructure, could result in a temporary increase in utility demands, which would be accommodated through existing or temporary construction-related utility systems. A Final Reuse Plan as been developed for those portions of Fort Greely being excessed. Potential utility usage from reuse alternatives was addressed in this plan. It is not expected that reuse of the post area in combination with NMD deployment would exceed any of the operational capabilities of the existing infrastructure system.

Mitigation Measures

No mitigation measures would be required.

4.3.1.11.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Utilities

Water

An increase in water usage would occur both under construction and operation of the GBI. For construction, it is expected that most of the water increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the Fairbanks region and thus would not increase regional demand. Construction worker-related water usage would be approximately 0.11 million liters per day (0.03 million gallons per day). The existing private wells in the surrounding ROI and the available capacity in Fairbanks of 55.60 million

liters per day (14.69 million gallons per day) has sufficient capacity to handle this potential increase. On-base water usage from construction would be related to site watering and any required batch plants. The available on-base capacity of 3 million liters per day (0.89 million gallons per day) would be sufficient to handle this increased demand.

Most of the operations-related water usage would occur off-base as housing use on Eielson AFB is at capacity. Off-base water usage would be expected to increase by 0.048 million liters per day (0.013 million gallons per day), which is within the available capacity of the existing private wells in the surrounding ROI and the available capacity in Fairbanks of 55.60 million liters per day (14.69 million gallons per day). On-base water usage would be associated with the GBI operations on the Yukon Training Area and would require the installation of new water wells. New wells and any proposed water system would be constructed and operated in accordance with local and state regulations and would be certified as required.

Wastewater

An increase in wastewater usage would occur both under construction and operation of the GBI. For construction, it is expected that most of the wastewater increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the Fairbanks region and thus would not increase regional demand. Construction worker-related wastewater generation would be approximately 0.11 million liters per day (0.03 million gallons per day). The existing private septic and commercial wastewater systems, which have an available capacity of 10.90 million liters per day (2.90 million gallons per day), in the surrounding ROI would have the available capacity to handle this temporary increase in demand. Portable wastewater facilities would be used for construction workers during the workday on the Yukon Training Area.

Most of the operations-related wastewater generation would occur off-base as housing use at Eielson AFB is at capacity. Off-base wastewater generation would be expected to increase by 0.048 million liters per day (0.013 million gallons per day) which could be handled by the existing off-base capacity in the ROI noted above. In addition, the Eielson AFB wastewater system has an available capacity of 2 million liters per day (0.53 million gallons per day) to handle any increase on the installation. Since the main GBI facilities would be located away from the existing wastewater system, a new septic wastewater facility would have to be constructed. The proposed new system would be constructed in accordance with local and state regulations and would be certified as required.

Solid Waste

The Fairbanks North Star Borough Landfill serves as the regional landfill and accepts waste from Eielson AFB and the Yukon Training Area. It is expected that construction and operation waste from the GBI facility would go to this landfill. The landfill, which has been in operation for 30 years, is currently having a new cell constructed. It is expected that this landfill would have sufficient capacity to meet the increase solid waste demand from construction and operation of the GBI landfill.

Electricity

Eielson AFB with its own power generation capabilities plus its tie-in with the regional utility provider has a 21-megawatt available electrical capacity. In addition, the available capacity of the regional provider is approximately 90 megawatts. These available electrical capacities would be sufficient to meet the demands of the GBI. Individual backup generators would be provided for the GBI facilities.

Natural Gas

There is no natural gas usage on Eielson AFB or the Yukon Training Area.

Cumulative Impacts

Some additional new military construction is expected to occur on Yukon Training Area/Eielson AFB. The construction of new facilities could result in a temporary increase in utility demands, which would be accommodated through existing or temporary construction-related utility systems. Operational requirements would be provided by existing or augmented service capacities. No other future programs that could contribute to cumulative utility system impacts have been identified within the region.

Overall, no cumulative utility system impacts are expected under the Proposed Action for the GBI element.

Mitigation Measures

No mitigation measures would be required.

4.3.1.11.2 North Dakota Installations

4.3.1.11.2.1 Grand Forks—Utilities

The Minuteman III fields and related activities associated with Grand Forks AFB will cease by the time of NMD deployment. Eventually, a total of 1,572 authorizations associated with the 321 MG would be cut from the overall personnel level at Grand Forks AFB. This reduction would

result in additional utility capacities in the ROI. GBI deployment would increase employment by approximately 255 personnel, which is only 16 percent of the base total reduction; therefore, there should be sufficient utility capacity in the ROI to handle NMD deployment.

Water

An increase in water usage would occur both under construction and operation of the GBI. For construction, it is expected that most of the water increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the Grand Forks region and thus would not increase regional demand. Construction worker-related water usage would be approximately 0.095 million liters per day (0.025 million gallons per day). The existing available capacity in the ROI of 37.16 million liters per day (9.82 million gallons per day) has sufficient capacity to handle this potential increase. On-base water usage from construction would be related to site watering and any required batch plants. On-base water is supplied through the surrounding water providers.

Most of the operations-related water usage would occur off-base as housing use on Grand Forks AFB is at capacity. Off-base water usage would be expected to increase by 0.048 million liters per day (0.013 million gallons per day), which is within the available capacity of the local providers within the ROI as noted above.

Wastewater

An increase in wastewater usage would occur both under construction and operation of the GBI. For construction, it is expected that most of the wastewater increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the Grand Forks region and thus would not increase regional demand. Construction worker-related wastewater generation would be approximately 0.095 million liters per day (0.025 million gallons per day). The existing private commercial wastewater systems, which have an available capacity of 80 million liters per day (21.1 million gallons per day), in the surrounding ROI would have the available capacity to handle this temporary increase in demand. Portable wastewater facilities would be used for construction workers during the workday on Grand Forks AFB.

Most of the operations-related wastewater generation would occur off-base, as housing use at Grand Forks AFB is at capacity. Off-base wastewater generation would be expected to increase by 0.048 million liters per day (0.013 million gallons per day), which could be handled by the existing off-base capacity in the ROI noted above. In addition, the

Grand Forks AFB wastewater system has an available capacity of 16.40 million liters per day (4.33 million gallons per day) to handle any increase on the installation.

Solid Waste

A new municipal landfill is planned for construction in the Grand Forks area by 2000. This landfill would be expected to have an operational life span of 40 years. This proposed landfill would have sufficient capacity to handle the increased demand from NMD activities.

Electricity

A local commercial provider provides electricity to Grand Forks AFB. The commercial provider in the ROI has sufficient capacity to handle the increased use from NMD deployment activities.

Natural Gas

A local commercial provider provides natural gas to Grand Forks AFB. The commercial provider in the ROI has sufficient capacity to handle the increased use from NMD deployment activities.

Cumulative Impacts

Some additional new military construction is expected to occur on Grand Forks AFB. The construction of new facilities could result in a temporary increase in utility demands, which would be accommodated through existing or temporary construction-related utility systems. Operational requirements would be provided by existing or augmented service capacities. No other future programs that could contribute to cumulative utility system impacts have been identified within the region. Overall, no cumulative utility system impacts are expected under the Proposed Action for the GBI element.

Mitigation Measures

No mitigation measures would be required.

4.3.1.11.2.2 Missile Site Radar—Utilities

The Missile Site Radar was an active site in 1975. As part of deployment and operation of this site and other facilities as part of the SRMSC, many of the local community's infrastructure were improved to handle the large influx of construction and operational workers. When the SRMSC was deactivated, the local communities continued to maintain the improved infrastructure systems, which has resulted in excess capacity for most of the utility systems.

Water

An increase in water usage would occur both under construction and operation of the GBI. For construction, it is expected that most of the water increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the surrounding region and thus would not increase regional demand. Construction worker-related water usage would be approximately 0.118 million liters per day (0.031 million gallons per day). The existing available capacity in the ROI of 3.32 million liters per day (0.88 million gallons per day) has sufficient capacity to handle this potential increase. On-base water usage from construction would be related to site watering and any required batch plants. On-base water is supplied through the surrounding water provider.

Most of the operations-related water usage would occur on-base, as housing would be built as part of GBI deployment at this site. Water to the site is provided by the local commercial water system, which has an available capacity of 3.32 million liters per day (0.88 million gallons per day). It is expected that GBI operations would require 0.068 million liters per day (0.018 million gallons per day) of water, which is within the available capacity.

Wastewater

An increase in wastewater usage would occur both under construction and operation of the GBI. For construction, it is expected that most of the wastewater increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the region and thus would not increase regional demand. Construction worker-related wastewater generation would be approximately 0.118 million liters per day (0.031 million gallons per day). The existing commercial wastewater systems in the nearby communities have sufficient capacity to handle this increased demand.

Most of the operations-related wastewater generation would occur on-base, as housing would be built as part of the GBI deployment at this site. The existing onsite two-cell evaporative sewage lagoon system would need to be reactivated for GBI deployment. The system would have sufficient capacity to handle the increased demand.

Solid Waste

A new municipal landfill is planned for construction in the Grand Forks area by 1999. This landfill would be expected to have an operational life span of 40 years. This proposed landfill would have sufficient capacity to handle the increased demand from NMD activities.

Electricity

A local commercial provider provides electricity to the Missile Site Radar. The commercial provider in the ROI has sufficient capacity to handle the increased use from NMD deployment activities.

Natural Gas

A local commercial provider provides natural gas to the Missile Site Radar. The commercial provider in the ROI has sufficient capacity to handle the increased use from NMD deployment activities.

Cumulative Impacts

The potential dismantlement and destruction of facilities at the Missile Site Radar would not be expected to result in cumulative construction-related impacts in combination with NMD activities. No other future programs that could contribute to cumulative utility system impacts have been identified at the Missile Site Radar. There is the potential that a GBI, BMC2, and XBR could be located at this site and one of the Remote Sprint Launch sites which could result in cumulative impacts to the local infrastructure system. However, the existing infrastructure within the region and in the city of Langdon was built up as part of the Safeguard System and has been maintained. This system is adequate to handle the potential increase demand in utility services. Overall, no cumulative utility system impacts are expected under the Proposed Action for the GBI element.

Mitigation Measures

No mitigation measures would be required.

4.3.1.12 Water Resources

This section addresses potential environmental impacts caused by changes to the water resources environment due to the construction and operation of the GBI element. These impacts include potential effects from ongoing projects and activities at these sites. The following criteria were used to determine potential impacts:

- Construction within floodplains that could result in impacts to surface water
- Changes in drainage patterns that could result in increased erosion resulting in an increase in the amount of sediment in surface waters
- Construction or operational activities that may contribute contaminates to surface and ground waters
- Storm water discharges relative to existing storm water permits
- Groundwater withdrawals that could affect regional aquifers

4.3.1.12.1 Alaska Installations

4.3.1.12.1.1 Clear AFS—Water Resources

Construction

During the 5-year construction period, approximately 243 hectares (600 acres) of undisturbed land would be altered to accommodate the new facilities, which is roughly 5 percent of the total base. The proposed GBI sites are not within the 100-year floodplain. The proposed sites are currently forested and are used for recreation and open space. Due to the relatively level topography and low precipitation, drainage patterns would only be altered slightly, and surface water runoff and erosion would be minimal. A minor increase in sediment in surface waters is possible, but not likely due to the distance between the construction site and surface water bodies.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.1.5, Hazardous Materials and Hazardous Waste Management.

GBI construction activities would result in the disturbance of more than 2 hectares (5 acres) of land and would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before construction. A copy of the Notice of Intent for Storm Water Discharges Associated with Construction Activity under a NPDES General Permit that would be filed

with the U.S. EPA would also be provided to the Alaska Department of Environmental Conservation. A copy of the SWPPP would also be provided to the Alaska Department of Environmental Conservation. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the U.S. EPA and the Alaska Department of Environmental Conservation.

The water requirements for the construction workforce in the region would be approximately 0.11 million liters per day (0.03 million gallons per day). As discussed under the utilities section, there is adequate water supply on-base and within the region to meet this demand. There are currently no aquifer issues, and with a relatively minor increase in water use, the GBI water requirements would not impact the water supply aquifer.

Operation

Potential impacts to water resources resulting from accidental spills of hazardous materials during operation would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.1.5, Hazardous Materials and Hazardous Waste Management.

Impacts from storm water are not expected. Following construction, the current SWPPP would be amended to define the methods and procedures for controlling the discharge of pollutants in the storm water runoff from the GBI facilities and would include the Best Management Practices that would be implemented for the GBI facilities. Storm water control measures could include detention areas such as constructed wetlands or ponds to contain runoff from the impervious areas at NMD facilities.

The water requirements for operations would be approximately 0.048 million liters per day (0.013 million gallons per day), which represents less than 1 percent of the current water usage. These water requirements would result in a total installation water usage of approximately 64 percent of the available water supply capacity. The planned new radar would use approximately 24.2 million liters per day (6.4 million gallons per day) less than the radar it is replacing (U.S. Department of the Air Force, 1997—EA for Radar Upgrade Clear AS, Alaska). There are currently no aquifer issues, and with the planned reduction in water use from the radar, the GBI water requirements would not impact the water supply aquifer.

Cumulative Impacts

No other future programs have been identified that when combined with the Proposed Action would contribute to cumulative water resources impacts. Although the NMD facilities would result in increased runoff and potential decrease in water quality, the mitigation measures to be

incorporated into the final design at each location would maintain the pre-NMD storm water runoff levels and quality so as not to contribute to cumulative impacts. The planned new radar system will result in less demand on the aquifer. A BMC2 could also be constructed during the same time as the GBI and would probably be located within the site proposed for the GBI. However, given the small amount of construction related to these facilities, no cumulative impacts would occur.

Mitigation

NPDES permit requirements, including the SWPPP for construction and operations and associated Best Management Practices and storm water control measures such as constructed wetlands or ponds would provide all necessary mitigation relative to storm water. If, during review of the SWPPP, it is determined that NMD construction would cause a negative effect on surface water, a Short Term Variance from Water Quality Standards would be submitted to the Alaska Department of Environmental Conservation. In addition, dewatering of a site during construction would require authorization under a state-wide general permit. All construction and operations would be completed in accordance with state and Federal water resources regulations. No additional mitigation measures for water resources are proposed.

4.3.1.12.1.2 Fort Greely—Water Resources

Construction

During the 5-year construction period, approximately 243 hectares (600 acres) of undisturbed land would be altered to accommodate the new facilities and access roads, which is roughly 5 percent of the total base. The proposed GBI site is not within the 100-year floodplain. Due to the relatively level topography and low precipitation, drainage patterns would only be altered slightly, and surface water runoff and erosion would be minimal. A minor increase in sediment in surface waters is possible, but not likely due to the distance between the construction site and surface water bodies.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.1.5, Hazardous Materials and Hazardous Waste Management.

GBI construction activities would result in the disturbance of more than 2 hectares (5 acres) of land and would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before construction. A copy of the Notice of Intent for Storm Water Discharges Associated with

Construction Activity under a NPDES General Permit that would be filed with the U.S. EPA would also be provided to the Alaska Department of Environmental Conservation. A copy of the SWPPP would also be provided to the Alaska Department of Environmental Conservation. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the U.S. EPA and the Alaska Department of Environmental Conservation.

The water requirements for the construction workforce would be approximately 0.123 million liters per day (0.033 million gallons per day). These water requirements represent approximately 10 percent of the water use when all buildings were in use. Water is obtained from two of five available wells. The GBI construction water requirements would result in a total installation usage of approximately 32 percent of the available water well capacity. With this small increase in water usage and the more than adequate recharge of the aquifer by the Delta River, the GBI water requirements would not impact the water supply aquifer.

Operation

Potential impacts to water resources resulting from accidental spills of hazardous materials during operation, would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.1.5, Hazardous Materials and Hazardous Waste Management.

Impacts from storm water are not expected. Following construction, the current SWPPP would be amended to define the methods and procedures for controlling the discharge of pollutants in the storm water runoff from the GBI facilities, and would include the Best Management Practices that would be developed for the GBI facilities. Storm water control measures could include detention areas such as constructed wetlands or ponds to contain runoff from the impervious areas at NMD facilities.

The water requirements for operations would be approximately 0.068 million liters per day (0.018 million gallons per day), which represents less than 6 percent of the current water usage. These water requirements would result in a total installation water usage of approximately 30 percent of the available water well capacity. With the more than adequate recharge of the aquifer by the Delta River, the GBI water requirements would not impact the water supply aquifer.

Cumulative Impacts

Construction and operation of a GBI at Fort Greely would only affect a very small portion of the base compared to the overall size of Fort Greely. Although the NMD facilities would result in increased runoff and potential decrease in water quality, the mitigation measures to be incorporated into

the final design at each location would maintain the pre-NMD storm water runoff levels and quality so as not to contribute to cumulative impacts. Currently there are several projects planned along with most of the cantonment area being excessed. These are more thoroughly discussed in the No-action Alternative (section 4.2.13.1.4). Potential impacts from maneuver exercises, discussed in the No-action Alternative, would not apply within the Proposed Action ROI as the land will no longer be used for maneuvers. No other future programs have been identified that when combined with the Proposed Action would contribute to cumulative water resources impacts. A BMC2 could also be constructed during the same time as the GBI. The BMC2 would probably be located within the site proposed for the GBI. However, given the small amount of construction related to these facilities no cumulative impacts would occur.

Mitigation

NPDES permit requirements, including the SWPPP for construction and operations and associated Best Management Practices and storm water control measures such as constructed wetlands or ponds, would provide all necessary mitigation relative to storm water. If, during review of the SWPPP, it is determined that NMD construction would cause a negative effect on surface water, a Short Term Variance from Water Quality Standards would be submitted to the Alaska Department of Environmental Conservation. All construction and operations would be completed in accordance with state and Federal water resources regulations. No additional mitigation measures for water resources are proposed.

4.3.1.12.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Water Resources

Construction

During the 5-year construction period, approximately 243 hectares (600 acres) of undisturbed land would be altered to accommodate the new facilities, which is roughly 5 percent of the total base. The proposed GBI site is not within the 100-year floodplain. Part of the site is on sloping terrain that would need to be considered in the SWPPP. Due to the low precipitation and with appropriate Best Management Practices, drainage patterns would only be altered slightly, and surface water runoff and erosion would be minimized. A minor increase in sediment in surface waters is possible, but not likely with appropriate storm water management during construction. A Short Term Variance from Water Quality Standards would be submitted to the Alaska Department of Environmental Conservation if potential effects on surface water are identified during preparation of the SWPPP.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.1.5, Hazardous Materials and Hazardous Waste Management.

GBI construction activities would result in the disturbance of more than 2 hectares (5 acres) of land and would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before construction. A copy of the Notice of Intent for Storm Water Discharges Associated with Construction Activity under a NPDES General Permit that would be filed with the U.S. EPA would also be provided to the Alaska Department of Environmental Conservation. A copy of the SWPPP would also be provided to the Alaska Department of Environmental Conservation. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the U.S. EPA and the Alaska Department of Environmental Conservation.

The water requirements for the construction workforce would be approximately 0.011 million liters per day (0.03 million gallons per day), which represents less than 3 percent of the current water usage. These water requirements would result in a total installation water usage of approximately 37 percent of the total water supply capacity. With the more than adequate recharge of the aquifer by the Tanana River, the GBI water requirements would not impact the water supply aquifer.

Operation

Potential impacts to water resources resulting from accidental spills of hazardous materials during operation would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.1.5, Hazardous Materials and Hazardous Waste Management.

Impacts from storm water are not expected. Following construction, the current SWPPP would be amended to define the methods and procedures for controlling the discharge of pollutants in the storm water runoff from the GBI facilities, and would include the Best Management Practices that would be implemented for the GBI facilities. Storm water control measures could include detention areas such as constructed wetlands or ponds to contain runoff from the impervious areas at NMD facilities.

The water requirements for operations would be approximately 0.048 million liters per day (0.013 million gallons per day), which represents less than 2 percent of the current water usage. These water requirements would result in a total installation water usage of approximately 37 percent of the total water supply capacity. With the

more than adequate recharge of the aquifer by the Tanana River, the GBI water requirements would not impact the water supply aquifer.

Cumulative Impacts

Construction and operation of a GBI at Yukon Training Area/Eielson AFB would only affect a very small portion of the base compared to the overall size of at Yukon Training Area/Eielson AFB. Although the NMD facilities would result in increased runoff and potential decrease in water quality, the mitigation measures to be incorporated into the final design at each location would maintain the pre-NMD storm water runoff levels and quality so as not to contribute to cumulative impacts. Currently, several minor projects are planned, as discussed in the No-action Alternative (section 4.2.13.1.5). Potential impacts from maneuver exercises, discussed in the No-action Alternative, would not apply within the Proposed Action ROI as the land will no longer be used for maneuvers. No other future programs have been identified that when combined with the Proposed Action would contribute to cumulative water resources impacts. A BMC2 could also be constructed during the same time as the GBI. The BMC2 would probably be located within the site proposed for the GBI. However, given the small amount of construction related to these facilities, no cumulative impacts would occur.

Mitigation

NPDES permit requirements, including the SWPPP for construction and operations and associated Best Management Practices and storm water control measures such as constructed wetlands or ponds, would provide all necessary mitigation relative to storm water. If, during review of the SWPPP, it is determined that NMD construction would cause a negative effect on surface water, a Short Term Variance from Water Quality Standards would be submitted to the Alaska Department of Environmental Conservation.

All construction and operations would be completed in accordance with state and Federal water resources regulations. No additional mitigation measures for water resources are proposed.

4.3.1.12.2 North Dakota Installations

4.3.1.12.2.1 Grand Forks AFB—Water Resources

Construction

Under the Proposed Action, the GBI missile fields and support facilities could be constructed at either the Weapons Storage Area or OT-5. Approximately 162 hectares (400 acres) of land would be required to accommodate the new facilities. This land has been previously disturbed

by the construction of the Weapons Storage Area, and some buildings would have to be removed to accommodate the new construction. Others could be modified to house the support facilities. For the other option at the OT-5 site, construction would occur on land that is currently open space.

The proposed GBI sites are not within the 100-year floodplain. Due to the relatively level topography and low precipitation, drainage patterns would only be altered slightly, and surface water runoff and erosion would be minimal. A minor increase in sediment in surface waters is possible, but not likely due to the level terrain and the distance between the construction site and surface water bodies.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.1.5, Hazardous Materials and Hazardous Waste Management.

GBI construction activities would result in the disturbance of more than 2 hectares (5 acres) of land and would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before construction. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the U.S. EPA.

The water requirements for the construction workforce would be approximately 0.095 million liters per day (0.025 million gallons per day). As discussed under the utilities section, there is adequate water supply on-base and within the region to meet this demand. With the relatively minor increase in water usage, the GBI water requirements would not impact the surface water supply availability or the water supply aquifer.

Operation

Potential impacts to water resources resulting from accidental spills of hazardous materials during operation would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.1.5, Hazardous Materials and Hazardous Waste Management.

Impacts from storm water are not expected. Following construction, the current SWPPP would be amended to define the methods and procedures for controlling the discharge of pollutants in the storm water runoff from the GBI facilities, and would include the Best Management Practices that would be developed for the GBI facilities. Storm water control measures could include detention areas such as constructed wetlands or ponds to contain runoff from the impervious areas at NMD facilities.

The water requirements for operations would be approximately 0.048 million liters per day (0.013 million gallons per day), which represents less than 1 percent of the current water usage. These water requirements would result in a total water usage of approximately 9 percent of the available water supply capacity. With the relatively minor increase in water usage, the GBI water requirements would not impact the surface water supply availability or the water supply aquifer.

Cumulative Impacts

Construction of the GBI and support facilities would occur on-base among several facilities that were constructed in 1956. The GBI and support facilities would only affect a small portion of the base. Past agricultural activities and development have resulted in a decrease in wetlands and an increase in the amount of surface runoff. This has in turn resulted in increased contamination and flooding. Although the NMD facilities would result in increased runoff and potential decrease in water quality, the mitigation measures to be incorporated into the final design at each location would maintain the pre-NMD storm water runoff level and quality so as not to contribute to cumulative impacts. Other construction projects and programs mentioned in the No-action Cumulative Impacts section 4.2.13.2.2, when combined with the Proposed Action, would not contribute to cumulative water resources impacts. A BMC2 could also be constructed during the same time as the GBI. The BMC2 would probably be located within the site proposed for the GBI or adjacent to this area. However, given the small amount of construction related to these facilities no cumulative impacts would occur.

Mitigation

NPDES permit requirements, including the SWPPP for construction and operations and associated Best Management Practices and storm water control measures such as constructed wetlands or ponds, would provide all necessary mitigation relative to storm water. All construction and operations would be completed in accordance with state and Federal water resources regulations. No additional mitigation measures for water resources are proposed.

4.3.1.12.2.2 Missile Site Radar—Water Resources

Construction

During the 3-year construction period, the proposed activity would take place on the majority of the site affecting 170 hectares (420 acres) of previously disturbed land. Many of the existing facilities would be removed before construction of the NMD facilities (see Cumulative Impacts). The proposed GBI site is not within the 100-year floodplain. Due to the level topography of the previously disturbed site, drainage

patterns would only be altered slightly, and surface water runoff and erosion would be minimal. A minor increase in sediment in surface waters is possible, but not likely due to the topography and the distance between the construction site and surface water bodies.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.1.5, Hazardous Materials and Hazardous Waste Management.

GBI construction activities would result in the disturbance of more than 2 hectares (5 acres) of land and would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before construction. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the U.S. EPA.

The water requirements for the construction workforce would be approximately 0.118 million liters per day (0.031 million gallons per day). The site is currently inactive with very little water use. The Missile Site Radar has recently switched to a commercial source of water, the Langdon Rural Water Users. The source of water is Mount Carmel Dam and Mulberry Creek. The GBI water requirements represent less than 1 percent of the treatment capacity of the surface water source. With this small increase in water usage, the GBI water requirements would not impact the surface water supply availability.

Operation

Potential impacts to water resources resulting from accidental spills of hazardous materials during operation would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.1.5, Hazardous Materials and Hazardous Waste Management.

Impacts from storm water are not expected. Following construction, an SWPPP may be required in accordance with the U.S. EPA NPDES General Permit for Storm Water Discharges Associated with Industrial Activity. The SWPPP would define the methods and procedures for controlling the discharge of pollutants in the storm water runoff from the GBI facilities. This would include an installation-wide SWPPP that would identify potential storm water pollution sources and the Best Management Practices that would be implemented to control the installation-wide pollution sources. The SWPPP would also include individual Best Management Practices plans developed for the GBI facilities. Storm water control measures could include detention areas such as

constructed wetlands or ponds to contain runoff from the impervious areas at NMD facilities.

The water requirements for operations would be approximately 0.068 million liters per day (0.018 million gallons per day). These requirements represent less than 1 percent of the treatment capacity of the surface water source. With this water usage, the GBI water requirements would not impact the surface water supply availability.

Cumulative Impacts

Construction of the GBI and support facilities would occur on-base among several other existing facilities. NMD facilities would replace some structures on-base that would be demolished or already have been removed as part of the planned dismantlement and destruction of facilities at this site. Even if there is some overlap between NMD and the proposed dismantlement and destruction of facilities, the minimal combined water requirements would not result in cumulative impacts to water resources.

The GBI and support facilities including the proposed BMC2 would affect the majority of the base. However, the entire site has previously been disturbed, and it will not affect any lands that were previously undisturbed. Past agricultural activities and development have resulted in a decrease in wetlands and an increase in the amount of surface runoff. This has in turn resulted in increased contamination and flooding. Although the NMD facilities would result in increased runoff and potential decrease in water quality, the mitigation measures to be incorporated into the final design at each location would maintain the pre-NMD storm water runoff level and quality so as not to contribute to cumulative impacts. No other future programs have been identified that when combined with the Proposed Action would result in cumulative water resources impacts.

Mitigation

NPDES permit requirements, including the SWPPP for construction and operations and associated Best Management Practices and storm water control measures such as constructed wetlands or ponds, would provide all necessary mitigation relative to storm water. All construction and operations would be completed in accordance with state and Federal water resources regulations. No additional mitigation measures for water resources are proposed. In addition to the GBI, a BMC2 could also be located at this site. This NMD element would be located within the GBI area and would not add to potential cumulative impacts.

4.3.1.13 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that Federal agencies identify and address disproportionately high and adverse environmental effects (including human, health, and economic and social effects) of its programs, policies, and activities on minority and low-income populations. An environmental justice impact would be a long-term health, environmental, cultural, or economic effect that has a disproportionately high and adverse effect on a nearby minority or low-income population, rather than all nearby residents. The potential for a disproportionately high and adverse effect could occur under either of two conditions: (1) the percentage of persons in low-income or minority populations in the census area meaningfully exceeds the percentage in the borough (Alaska) or county (North Dakota), the regions of comparison, or (2) the percentage of low-income or minority population in the census area exceeds 50 percent (see tables 3.15-1 and 3.15-2).

4.3.1.13.1 Alaska Installations

4.3.1.13.1.1 Clear AFS—Environmental Justice

Deployment of the GBI at Clear AFS would not disproportionately affect any minority or low-income populations. As discussed above, there would be few environmental impacts from the deployment of the GBI at Clear AFS. Most environmental and human health impacts would be contained within the base boundary and would not impact any nearby communities. No subsistence food sources or hunting areas would be impacted by deployment, and no Native American or traditional resources would be affected. Anderson, the closest community to Clear AFS, has a 15.68 percent minority population and 3.71 percent low-income population. This is below the Yukon–Koyukuk Census Area ROI for Clear AFS of 58.68 percent minority and 26.05 percent low-income population.

Cumulative Impacts

No other projects or activities in the region along with NMD have been identified that would contribute to potential cumulative environmental justice impacts. The addition of the BMC2 along with the GBI element would not combine to create any cumulative environmental justice concerns.

Mitigation Measures

No mitigation measures would be required.

4.3.1.13.1.2 Fort Greely—Environmental Justice

Deployment of the GBI at Fort Greely would not disproportionately affect any minority or low-income populations. As discussed above, there would be few environmental impacts from the deployment of the GBI at Fort Greely. Most environmental and human health impacts would be contained within the base boundary and would not impact any nearby communities. Potential impacts to subsistence food sources or hunting areas would not affect local subsistence gathers, and no Native American or traditional resources would be affected. Delta Junction, the closest community to Fort Greely, has a 9.37 percent minority population and 8.45 percent low-income population. This is below the Southeast Fairbanks census area ROI for Fort Greely of 22.07 percent minority and 14.19 percent low-income population.

Cumulative Impacts

The types of environmental impacts associated with reuse of the Fort Greely cantonment area can not be quantified at this time; however, it is expected that the Fort Greely cantonment is far enough way from adjacent populations that no cumulative environmental justice concerns should occur in combination with NMD activities. The addition of the BMC2 along with the GBI element would not combine to create any cumulative environmental justice concerns.

Mitigation Measures

No mitigation measures would be required.

4.3.1.13.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Environmental Justice

Deployment of the GBI at this location would not disproportionately affect any minority or low-income populations. As discussed above, there would be few environmental impacts from the deployment of the GBI at the Yukon Training Area/Eielson AFB. Most environmental and human health impacts would be contained within the base boundary and would not impact any nearby communities. No subsistence food sources or hunting areas would be impacted by deployment, and no Native American or traditional resources would be affected. The closest community that could be affected by GBI deployment is the Moose Creek census area adjacent to Eielson AFB. The Moose Creek census area has a 20.29 percent minority population and 9.42 percent low-income population. This is not meaningfully greater than the Fairbanks North Star Borough census area ROI for this location with 19.63 percent minority and 7.58 percent low-income population. In addition, as noted above, no environmental or human health impacts that would affect minority or low-income populations are expected.

Cumulative Impacts

The community of Moose Creek is within an incompatible noise contour (DNL 65 dBA) for a residential community caused by aircraft activity on Eielson AFB. NMD activities would not contribute to increased noise levels in the community of Moose Creek and would therefore not cause any cumulative environmental justice impacts in this community. No other projects or activities in the region along with NMD have been identified that would contribute to potential cumulative environmental justice impacts including potential other projects at the Yukon Training Area or Eielson AFB. The addition of the BMC2 along with the GBI element would not combine to create any cumulative environmental justice concerns.

Mitigation Measures

No mitigation measures would be required.

4.3.1.13.2 North Dakota Installations

4.3.1.13.2.1 Grand Forks AFB—Environmental Justice

Deployment of the GBI at Grand Forks AFB would not disproportionately affect any minority or low-income populations. As discussed above, there would be few environmental impacts from the deployment of the GBI at Grand Forks AFB. Most environmental and human health impacts would be contained within the base boundary and would not impact any nearby communities, and no Native American or traditional resources would be affected. However, as discussed above under Health and Safety, there is the potential that the hazardous extent of the gas from an unlikely accidental leak of liquid propellant could exceed the base boundary and affect nearby areas. The census block groups (113-3, 113-6, 116.97-1, and 116.97-7) that surround Grand Forks AFB have a 2.72, 9.45, 0, and 5.47 percent minority population and 11.56, 5.92, 4.44, and 9.54 percent low-income population, respectively. When compared to the Grand Forks County census area ROI for Grand Forks AFB of 6.39 percent minority and 12.32 percent low-income population, census block group 113-6 is the only area with a higher minority population than the Grand Forks County census area. However, it is not meaningfully greater for purposes of environmental justice analysis. In addition, the extent of the hazardous gas from a leak does not include any residential units within block 113-6; therefore, no minority groups within this census block would be affected.

Cumulative Impacts

No other projects or activities in the region along with NMD have been identified that would contribute to potential cumulative environmental justice impacts, including potential other projects at Grand Forks AFB.

The addition of the BMC2 along with the GBI element would not combine to create any cumulative environmental justice concerns.

Mitigation Measures

No mitigation measures would be required.

4.3.1.13.2.2 Missile Site Radar—Environmental Justice

Deployment of the GBI at the Missile Site Radar would not disproportionately affect any minority or low-income populations. As discussed above, there would be few environmental impacts from the deployment of the GBI at the Missile Site Radar. Most environmental and human health impacts would be contained within the base boundary and would not impact any nearby communities. However, as discussed above under Health and Safety, there is the potential that the hazardous extent of the gas from an unlikely accidental leak of liquid propellant could exceed the base boundary and affect nearby areas. However, this area consists of agricultural land and contains no residential structures. No Native American or traditional resources would be affected. The block group that includes the Missile Site Radar and the closest community, Nekoma, has no minority population and 5 percent low-income population. This is below the Cavalier County census area ROI for the Missile Site Radar of 0.76 percent minority and 14.07 percent low-income population.

Cumulative Impacts

No other projects or activities in the region including the potential dismantlement and destruction of the SRMSC, along with NMD, have been identified that would contribute to potential cumulative environmental justice impacts at the Missile Site Radar. The addition of the BMC2, XBR, and GBI within the region would not combine to create any cumulative environmental justice concerns.

Mitigation Measures

No mitigation measures would be required.

4.3.1.14 Subsistence

This section addresses potential subsistence-related impacts due to changes caused by the construction and operation of the GBI element. These impacts include potential effects from ongoing projects and activities at these sites. The following criteria were used to determine potential impacts:

- Whether any subsistence activities are currently occurring on the land potentially affected
- Construction or operational activities that may reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes
- Construction or operational activities that may limit or deny reasonable access to subsistence resources on public lands.

Section 810(a) of ANILCA requires an evaluation of the effects of the NMD program on subsistence use. This section serves as the evaluation under ANILCA. If the Proposed Action would significantly restrict subsistence uses, then the Federal government is required to provide notice and hearing.

The Proposed Action at any of the potential NMD deployment sites in Alaska would result in no significant adverse effects on the customary or traditional subsistence uses based on the limited uses of the land at this location, as described below. In addition, it was concluded in the *Alaska Army Lands Withdrawal Renewal Legislative EIS* that continued military activities at both the Yukon Training Area and Fort Greely would not result in significant impacts to subsistence uses (U.S. Department of the Army, 1999—Alaska Army Lands Withdrawal Renewal Final Legislative EIS). As part of the EIS process, the appropriate Alaska Native Organizations were consulted regarding potential impacts from NMD activities (see section 5.0, Consultation and Coordination). Once an NMD deployment site is selected, the NMD program would continue to coordinate activities with affected subsistence users.

4.3.1.14.1 Clear AFS—Subsistence

Under the Proposed Action, a GBI element could be constructed and become operational at Clear AFS, but there would be virtually no change to subsistence hunting or fishing on or around the base. Air Force personnel, civilian base personnel and the people they sponsor are the only people allowed to hunt or fish on-base, which may include a small number of subsistence users. However, this is a very small percentage of the personnel at Clear AFS. Therefore, no significant impacts to subsistence uses are expected at Clear AFS. However, if Clear AFS is selected, an additional 255 personnel could increase the pressure on

subsistence resources in the surrounding area if they hunt or fish. A portion of these jobs would be filled by residents of the local areas. This pressure would be minimal and would not be anticipated to have a significant impact on subsistence resources in the area.

Cumulative Impacts

A BMC2 element could also be constructed at Clear AFS as part of the NMD program. This element would not have any effect on subsistence resources since no private citizens are allowed access to hunt or fish on the base. No other future projects have been identified that would have any cumulative subsistence impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.1.14.2 Fort Greely—Subsistence

Potential impacts to subsistence use at Fort Greely have been previously addressed in the *Alaska Army Lands Withdrawal Renewal Final Legislative EIS* (U.S. Department of the Army, 1999). This EIS concluded that residents of the native villages of Healy Lake, Dot Lake, and Dry Creek are the main subsistence users in the area. However, their ranges normally do not extend as far as Fort Greely. Some residents and subsistence users from other areas do occasionally make the trip to hunt on Fort Greely, but this is considered a rare occurrence. Subsistence use in the area of Fort Greely is not expected to drastically change by the location of a GBI at the base. The GBI would require approximately 243 hectares (600 acres) of land at Fort Greely. This proportion is relatively small compared to the rest of the base, and there will still be plenty of opportunity for the few subsistence hunters and fishermen that utilize Fort Greely. A slight increase in pressure to subsistence resources could occur because of the increase in personnel for the potential GBI facility if they use the surrounding area to hunt or fish. However, a portion of these workers would come from the existing labor force in the area. The total number of personnel would be substantially less than the 750 personnel located at Fort Greely in 1997 before base realignment. Overall, no significant impacts to subsistence uses would occur at Fort Greely from implementation of the Proposed Action.

Cumulative Impacts

Currently, portions of Fort Greely are being realigned. This is affecting only the cantonment area of Fort Greely and should have no impact on subsistence resources. There could also be a BMC2 located at Fort Greely that would require a very small parcel of land and would not affect subsistence activities. However, if the Fort Greely Reuse Plan preferred alternative is successfully implemented and Fort Greely is selected as a

GBI and BMC2 site, this could result in a cumulative impact to subsistence resources if the personnel that move into the area hunt or fish. The number of personnel that move into the area should be less than the number of personnel that left Fort Greely after base realignment in 1997 assuming some jobs would be filled by local residents. No other programs have been identified for Fort Greely that would contribute to any cumulative subsistence impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.1.14.3 Yukon Training Area (Fort Wainwright)/Eielson AFB—Subsistence

The location of a GBI at the Yukon Training Area would not change subsistence activities on or around the installation, since virtually no subsistence activities take place on the installation. The Yukon Training Area falls into the Fairbanks North Star Borough, which is not considered a rural area and where resident are exempt from subsistence considerations under ANILCA. Subsistence users may travel from other areas for subsistence purposes, but this is a rare occurrence. In addition, the NMD program would only use a very small percentage of the overall base area. However, if the Yukon Training Area is selected as a GBI site, approximately 255 personnel could move into the area, increasing pressure on subsistence resources if they hunt or fish. However, a portion of these workers would be hired from the local labor force, reducing the number of new personnel that would move into the area. The increased pressure on subsistence resources would be minimal given the small increase in new personnel that would move into the area and hunt. Overall no significant impacts to subsistence uses would occur.

Cumulative Impacts

Several future projects have been identified for the Yukon Training Area. However, as stated above, very little subsistence activities occur on the base, and no overall cumulative impacts would be expected.

Mitigation Measures

No mitigation measures would be required.

4.3.2 BMC2

For the NMD system, only one new Execution Level BMC2 node would be selected from one of the deployment alternatives that consists of Clear AFS, Fort Greely, and the Yukon Training Area/Eielson AFB in Alaska, and Grand Forks AFB and the Missile Site Radar in North Dakota. It is expected that the Execution Level BMC2 node deployment location selected would be the same as the GBI element location. For this EIS, the potential deployment location analyzed would occur within the 243-hectare (600-acre) GBI deployment boundary location or within an existing facility identified for use under the GBI section. Therefore, potential impacts of BMC2 deployment for Clear AFS, Fort Greely, the Yukon Training Area/Eielson AFB, Grand Forks AFB, and the Missile Site Radar are considered under the GBI deployment alternative section.

In addition to the Execution Level BMC2 node, a Command Level and Service Component Command Center BMC2 nodes would be required. The Command Level node would be located at Cheyenne Mountain AFS in Colorado, and would consist of placing computer and communication equipment within an existing room, which may require minor interior modifications. Appropriate health and safety and hazardous materials and waste management regulations would be followed during any modifications; therefore, no impacts would be anticipated at the Cheyenne Mountain Complex.

The Service Component Command BMC2 node could be located at both Peterson AFB, Colorado and Vandenberg AFB, California. At Peterson AFB an annex could be connected to headquarter facilities currently planned for construction as part of the restationing of Army Space Command to Peterson AFB and two other facilities for the North American Aerospace Defense Command and U.S. Space Command. The construction of these facilities was addressed in the *Environmental Assessment for the Construction of North American Aerospace Defense Command Headquarters and Army Space Command Facilities at Peterson AFB, Colorado*, (U.S. Department of the Air Force, 1998). This EA resulted in a Finding of No Significant Impact from the construction or operation of these facilities. The construction of the proposed NMD Service Component Command BMC2 node would connect this facility to one of those addressed in the above EA. Since construction of the NMD facility would occur within the same ROIs as the other proposed facilities, it is unlikely that any environmental impacts would result. However, the facility design has not been finalized. Once the design is completed it would be reviewed against the EA to determine what additional environmental documentation would be required.

The other Service Component Command BMC2 node could be located at Vandenberg AFB, California, and would consist of placing computer and communication equipment within an existing room within Building

10577. Appropriate health and safety and hazardous materials and waste management regulations would be followed during any modifications that may be required within this room; therefore, no impacts would be anticipated at Vandenberg AFB.

Consistent with Council on Environmental Quality regulations, the scope of the analysis presented in this EIS for the BMC2 deployment alternatives was defined by the range of potential environmental impacts that would result from implementation of the Proposed Action. Resources that have a potential for impacts were considered in the analysis to provide the decisionmakers with sufficient evidence and analysis for evaluation of potential effects of the action. For this EIS, the environment is discussed in terms of 15 resource areas. Initial analysis indicated that the potential deployment of the BMC2 element would not result in short-or long-term impacts to airspace, hazardous materials and hazardous waste management, health and safety, noise, and utilities. The reasons for not addressing these resource areas are briefly discussed in the following paragraphs.

Airspace. Under the Proposed Action, there are no requirements for any restricted airspace at any of the BMC2 deployment alternatives as a result of the NMD program; therefore, there would be no impact to regional airspace, and this resource area is not analyzed further.

Hazardous Materials and Hazardous Waste Management. The BMC2 would be an administrative facility with operations and materials used similar to any office building; therefore, there would be no impact to hazardous material and hazardous waste management, and this resource area is not analyzed further.

Health and Safety. The BMC2 would be an administrative facility with operations similar to any office building; therefore, there would be no risks to the health and safety of the public, and this resource is not analyzed further.

Noise. The main noise generated under the Proposed Action would be from construction equipment, which would be short-term and affect a small area around the construction site; therefore, there would be no noise-related impacts, and this resource area is not analyzed further.

Utilities. BMC2 node would require approximately 20 to 30 personnel at the deployment site. This increase in personnel would result in only a small increase in gas, water, and electrical consumption and generation of sewage; therefore, there would be no impact to utilities, and this resource area is not analyzed further.

4.3.3 IFICS DATA TERMINAL

It is expected that approximately 14 IFICS Data Terminal sites could be required for NMD deployment. The operational requirements for the IFICS Data Terminal are still being identified. As such, the specific locations where the IFICS Data Terminal could be deployed have not yet been determined. Regions under study include Alaska and North Dakota. In addition, as the operational requirements are refined other regions may be identified. It is anticipated that DOD installations would be used to deploy IFICS Data Terminals because of the security and maintenance infrastructure they could provide; however, if no DOD installations are within the potential performance region required for an IFICS Data Terminal to operate, then other land would be investigated.

Since specific sites have not been identified, provided below is a general description of the types of impacts that could be expected from deployment of an IFICS Data Terminal. Once specific sites are identified, separate site-specific environmental analysis, as required, would be performed based on the initial analysis in this EIS. The IFICS Data Terminal would require approximately 2 hectares (6 acres) of land or up to 7 hectares (17 acres) if two IFICS Data Terminals are required at one site. Consistent with Council on Environmental Quality regulations, the scope of the analysis presented in this EIS for the IFICS Data Terminal deployment was defined by the range of potential environmental impacts that would result from implementation of the Proposed Action. Resources that have a potential for impacts were considered in the analysis to provide the decisionmakers with sufficient evidence and analysis for evaluation of potential effects of the action. For this EIS, the environment is discussed in terms of 15 resource areas. Of the 15 resource areas, 11 resource areas are discussed below for IFICS Data Terminal deployment. Initial analysis indicated that the potential deployment of the IFICS Data Terminal element would not result in short- or long-term impacts to airspace, socioeconomics, transportation, and utilities. The reasons for not addressing these resource areas are briefly discussed in the following paragraphs.

Airspace. Under the Proposed Action, there are no requirements for any restricted airspace at any of the IFICS Data Terminal deployment alternatives as a result of the NMD program; therefore, there would be no impact to regional airspace, and this resource area is not analyzed further.

Socioeconomics. Under the Proposed Action, there would be a minimal security personnel force associated with deployment of an IFICS Data Terminal. In addition, construction of the site would create minimal construction-related jobs. Therefore, there would be no impact to local or regional socioeconomic resources, and this resource area is not analyzed further.

Transportation. Under the Proposed Action, there may be a minimal security personnel force associated with deployment of an IFICS Data Terminal; therefore, there would be minimal impact to local or regional transportation resources, and this resource area is not analyzed further.

Utilities. There may be a minimal site security force associated with operation of the IFICS Data Terminal. The site would require a small amount of electricity to operate. The site may have water connections or use bottle water for the security personnel. Overall, there would be no impact to utilities, and this resource area is not analyzed further.

4.3.3.1 Air Quality

This section addresses potential environmental impacts caused by changes to the air quality environment due to the proposed construction and operation of an IFICS Data Terminal.

Construction

The standard IFICS Data Terminal site would require disturbance over a 6-month construction period. Table 4.3.3.1-1 summarizes the overall construction emissions anticipated for construction of an IFICS Data Terminal.

Table 4.3.3.1-1: Potential IFICS-related Construction Emissions

Pollutant	Emissions in Metric Tons (Tons)[3]
Carbon Monoxide	1 (1)
Oxides of Nitrogen	2 (3)
Oxides of Sulfur	< 1 (< 1)
PM-10[1]	19 (21)
Reactive Organic Gases[2]	1 (1)

Source: Sacramento Metropolitan Air Quality Management District, 1997—Air Quality Thresholds of Significance.

[1] PM-10 estimate includes fugitive dust and combustive emissions

[2] Reactive Organic gases are assumed to all be volatile organic compounds

[3] For up to a 7-hectare (17-acre) site and up to a 557-square-meter (6,000-square-foot) building.

Construction would be conducted in accordance with applicable regulations and permits. Related emissions would be intermittent and would not be anticipated to cause exceedances of AAQS. As such, the proposed construction would have minimal impact on air quality.

Operation

Depending on the location, the IFICS Data Terminal would be powered by an offsite commercial source with a backup emergency generator or by a dedicated generator. The generator would have a 175-kilowatt capacity. For backup power the generator would be operated for maintenance cycling and emergency power conditions in accordance with applicable permits. The generator would be fueled through a 1,500-liter (400-gallon) aboveground storage tank, also used under applicable permits. Table 4.3.3.1-2 shows representative emissions for a 175-kilowatt generator based on 500 hours of operation per year.

Table 4.3.3.1-2: Anticipated Emergency Generator Emissions[1]

Pollutant	Potential Annual Emissions in Metric Tons Per Year (Tons Per Year)[2]
Carbon Monoxide	0.30 (0.32)
Oxides of Nitrogen	0.69 (0.76)
Oxides of Sulfur[3]	0.43 (0.47)
PM-10	0.04 (0.04)
Total Organic Compounds	0.04 (0.04)

Source: U.S. EPA, 1997—AP-42 Section 3.3.

[1]Assumes a 175-kilowatt generator.

[2]Assumes 500 hours of operation per year.

[3]Assumes 1 percent sulfur in fuel

A dedicated generator would operate 24 hours a day. Table 4.3.3.1-3 shows representative emission levels for a dedicated 175-kilowatt generator. Before construction and operation of any IFICS Data Terminal, appropriate Federal and state air quality permits would be obtained.

Table 4.3.3.1-3: Potential IFICS Data Terminal Site Full-Time Generator Emissions[1]

Pollutant	Metric Tons (Tons) [2] per year
Carbon Monoxide	5.12 (5.65)
Total Organic Compounds	0.66 (0.72)
Nitrogen Oxides	12.09 (13.36)
Sulfur Oxides[3]	11.30 (12.48)
PM-10	1.36 (1.50)

Source: U.S. EPA, 1995—Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1.

[1] Assumes a 175-kilowatt generator

[2] Assumes 8,760 hours of operation per year

[3] Assumes 1 percent sulfur in fuel

At some of the proposed sites, a small amount of road upgrade or paving may be required. This activity would not cause significant air quality impacts at the respective sites.

Overall, installation and operation of the IFICS Data Terminal would not be expected to generate significant air emissions.

Cumulative Impacts

Potential cumulative air quality impacts could occur if either construction or operation emissions from an IFICS Data Terminal in combination with other local or regional activities cause the exceedance of any air quality standards. The potential for such cumulative impacts would be determined on a site-specific basis. However, given the limited amount of construction and operational emissions, no cumulative impacts would be expected.

Mitigation Measures

No mitigations would be required.

4.3.3.2 Biological Resources

During normal NMD operations the IFICS Data Terminal would not transmit except for a few minutes during annual testing of the equipment. The IFICS Data Terminal would also transmit if a GBI is launched. Given the short duration of transmission, no adverse impacts to biological resources are anticipated from operations.

Vegetation

Ground disturbance during construction would result in removal of vegetation and wildlife habitat within the proposed site. This would only represent a small amount of vegetation and should not result in adverse impacts.

Wildlife

Impacts to wildlife could occur both during the construction and operation of an IFICS Data Terminal. Construction ground disturbance and equipment noise-related impacts could include loss of habitat, displacement of wildlife, increased stress, disruption of daily/seasonal behavior, and mortality of less mobile species. Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 to 98 dBA. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. Flushing would slightly increase individual energy expenditure. Some wildlife may leave the area permanently, while others may likely become accustomed to the increased noise and human presence. However, given the small area of disturbance and short-duration of the construction period (6 months) it is not anticipated that any adverse impacts would occur.

Most operational impacts to wildlife from an IFICS Data Terminal would come from security lighting and noise from the electrical generators required for the site. The lighting and noise could discourage species less tolerant of these disturbances to avoid the area. Generator noise levels expected at the site could range from 80 to 85 dBA at up to 105 meters (344 feet). These noise levels would only occur a couple of hours a week during maintenance activities for backup generators or continuously if no commercial power is available to the site.

Threatened and Endangered Species

The potential impacts to threatened and endangered plant and wildlife species would be similar to those described above. Any loss of threatened or endangered species or critical habitat could constitute a significant impact. Before construction, the potential deployment site would be reviewed for threatened and endangered species and critical habitat. As part of this review process, the USFWS would be contacted

to determine if any species are known to occur within the proposed deployment area. Given the small area required for IFICS Data Terminal deployment, areas that contain or have critical habitat for threatened and endangered species could be avoided or impacts minimized through the siting process and consultation with appropriate Federal, state, and local agencies.

Sensitive Habitats

Sensitive habitat would mainly consist of wetlands. Wetlands could potentially be affected by the project through filling, draining, trenching and other general construction activities. Because wetlands generally constitute valuable wildlife habitat, any significant changes to these wetlands would likely result in subsequent impacts on wildlife. Some functions of wetlands that may be affected by project impacts include:

- Recharging and discharging of groundwater
- Lowering flood peaks by retaining floodwaters
- Protecting banks and shores from erosion by floodwaters
- Retaining sediments and toxic substances that may be harmful to downstream habitats
- Producing and exporting organic matter that may support downstream food chains
- Providing fish and wildlife habitat

As part of the IFICS Data Terminal siting process, wetlands would be avoided, when possible. Given the small area required for construction of an IFICS Data Terminal, it is likely that wetlands could be avoided. Implementation of appropriate erosion control procedures and other management practices would minimize water quality impacts to wetlands that could occur adjacent to the site. Compliance with the necessary wetlands permits required would also minimize impacts.

Cumulative Impacts

Given the small amount of area required for an IFICS Data Terminal cumulative impacts would not be expected. Cumulative impacts could result from loss of critical habitat or threatened or endangered species in combination with other known or future projects in the area of an IFICS Data Terminal; however, through the siting and consultation process with the appropriate Federal, state, and local agencies, cumulative impacts would be avoided.

Mitigation Measures

Threatened or endangered species and any sensitive habitats would be taken into consideration during the siting process and avoided, when possible. In addition, any impacts identified would be mitigated through compliance with Section 7 of the Endangered Species Act.

Wetland impacts would be avoided by siting the IFICS Data Terminal away from such resources, when possible. Best Management Practices such as stabilizing fill slopes from erosion and the use of hay bales to filter sediment from storm water runoff would be implemented. Section 404 permits will be obtained if actual siting determines that wetlands would be affected and before any discharge of fill material. Compliance with the required wetlands permits would also work to minimize impacts. Maintenance of wetland quality and value would be coordinated with applicable agencies. The permitting process would entail review of proposed activities and possible mitigations by all interested parties and applicable agencies.

4.3.3.3 Cultural Resources

The following section discusses the types of impacts that could occur on historic properties from the construction of an IFICS Data Terminal. These impacts could be significant if they result in the destruction, disturbance, alteration, or intrusion on resources listed in, or eligible for listing in, the NRHP or considered important to Native American groups.

Prehistoric and Historic Archaeological Resources

The significance of archaeological resources lies in the data they contain. These data are embodied in material remains, in the spatial relationship among such remains, and in their environmental context. Ground-disturbing activities required for construction of an IFICS Data Terminal could cause significant direct impacts on archaeological resources. These activities could diminish or destroy the value of the resource by removing or disturbing all or a portion of the site, resulting in loss of integrity and valuable scientific data. However, during the siting process, archaeologically sensitive areas would be avoided to the extent practicable.

Historic Buildings and Structures

Impacts to historically significant buildings and structures could occur if construction of the IFICS Data Terminal altered relevant visual features or the character of the property's surrounding environment, including its setting, feeling, or association. Siting the IFICS Data Terminal away from any historic properties would minimize these impacts.

Native Populations/Traditional Resources

Significant impacts on native populations/traditional resources could result from the same activities described for archaeological resources. In addition, impacts could result from visual or aural intrusion on sacred areas or restricted access to traditional-use areas. However, such impacts can be reduced to not significant levels through avoidance of the area through other measures developed in consultation process with the affected native groups.

Cumulative Impacts

Potential cumulative impacts on historic properties would be minimized through avoidance or through other means described under mitigation measures.

Mitigation Measures

If historic properties are identified during the siting or construction of the IFICS Data Terminal, the mitigation of choice would be avoidance; however, in those cases where avoidance is not possible, mitigation measures would be developed in consultation with the affected SHPO. For prehistoric and historic archaeological sites and traditional cultural properties, the typical mitigation measures would include excavation and data recovery using acceptable professional methods. For historic buildings and structures, mitigation measures typically involve recordation using standards established by the HABS/HAER. Given the small area required for an IFICS Data Terminal, it is likely that any historic properties could be avoided by finding a suitable alternate location.

4.3.3.4 Geology and Soils

The IFICS Data Terminal site has not yet been selected but would likely make use of portions of existing military installations with geologic and soil conditions that have been proven suitable for military construction projects in the past. On this basis, it is anticipated that selected sites would have terrain and foundation conditions favorable for IFICS Data Terminal construction and that there would be a low potential impact to soils as a result of the Proposed Action. The primary soil management issues would most likely be limited to soil erosion from short-term construction activities. Best Management Practices would be implemented to minimize negative short-term effects of clearing and grading activities during site preparation, as well excavations and grading for connecting infrastructure, roadways and parking. Once construction is complete and vegetation is replaced, there should be little soil erosion from operation of the site.

Some potential IFICS Data Terminal sites (e.g., Alaska) could lie in a high seismic zone and would be subject to a high probability of severe ground shaking during the design life of the facility. Construction of the IFICS Data Terminal would incorporate seismic design parameters consistent with the critical nature of the facility and its geologic setting. The facilities would be sited at an elevation above the wave run-up line of a potential tsunami.

Cumulative Impacts

Given the limited amount of ground disturbance associated with an IFICS Data Terminal, no cumulative impacts to geology and soils would be anticipated.

Mitigation Measures

Best Management Practices would be used to reduce the potential for soil erosion during construction. Various measures may be recommended to reduce erosion of slopes, partially graded streets, and pads. Alternative recommendations may include minimizing the amount of area exposed during clearing; frequent watering of graded areas; use of soil stabilizers; and revegetation of slopes and open areas as soon as possible to enhance long-term stability.

4.3.3.5 Hazardous Materials and Hazardous Waste Management

This section addresses potential environmental impacts caused by hazardous materials and hazardous waste management practices associated with construction and operation of an IFICS Data Terminal, including the potential impacts on the ongoing remediation activities at existing contaminated sites.

Regulatory standards and guidelines have been applied in determining the potential impacts associated with the use of hazardous materials and the generation of hazardous waste. The following criteria were used to identify potential impacts:

- Amount of hazardous materials brought onto the installations to support the IFICS Data Terminal that could result in exposure to the environment or public through release or disposal practices
- Hazardous waste generation that could increase regulatory requirements
- Pollution prevention practices to be utilized during the NMD program to prevent and/or improve environmental impacts associated with operations
- Program activities that would affect IRP activities
- Construction of facilities in areas where radon levels exceed U.S. EPA recommendations
- Use of pesticides that are not consistent with existing installation practices

The IFICS Data Terminal would require the use of all-new facilities. No existing building modifications would be required as part of the IFICS Data Terminal deployment. There would be no impact to existing asbestos, PCBs, or lead-based paint at any of the potential deployment locations, and these materials would not be used in the construction of the IFICS Data Terminal; therefore, asbestos, PCBs, and lead-based paint are not addressed further.

Construction

Hazardous wastes generated during construction would consist of materials such as waste oils, hydraulic fluids, cleaning fluids, cutting fluids, and waste antifreeze. These materials would be containerized and properly disposed of by the individual contractors. Any spill of a hazardous material or hazardous waste that may occur during construction would be quickly remediated in accordance with the contractor's SWPPP and Project Spill Prevention, Control, and Countermeasure Plan that would be developed for each site. All

hazardous materials used and hazardous waste generated during construction would be handled in accordance with applicable Federal, state, and local regulations.

Construction activities would be centralized to the greatest extent possible and would occur at the selected project site and on specified construction laydown areas and access roads. Temporary storage tanks and other facilities for the storage of hazardous materials would be located in protected and controlled areas designed to comply with site-specific spill prevention and countermeasure plans.

Operation

Hazardous Materials Management. Under the Proposed Action, the maintenance and operation activities at the IFICS Data Terminal would be minimal. The expected hazardous materials include lubricants and oils, electrical generator fuels, and backup power batteries. These materials would be used in the periodic inspection and preventative maintenance associated with the backup generator system. Besides the fuel for the electrical generator, no hazardous materials would be stored onsite. One piece of equipment used on the system consists of a klystron tube, which contains small amounts of beryllium. Beryllium is listed on the Toxic Substance Control Act inventory. If maintenance is required, a new tube would be brought onsite and the replaced tube sent back to the manufacturer for repair. Any location where hazardous materials are used will have appropriate Material Safety Data Sheets posted. The appropriate spill response and hazardous materials management plan would be developed for the IFICS Data Terminal. The use of these materials would be accordance with Federal, state, and local regulations. An overall Pollution Prevention Plan is in the process of being developed for the NMD program.

Hazardous Waste Management. As discussed above, there would be minimal use of hazardous materials at the IFICS Data Terminal. Most hazardous waste generated would be used oil from the occasional maintenance of the electrical generators at the site. The used oils would be recycled in accordance with appropriate regulations by the host deployment installation. Any hazardous waste generated at the site would be removed after maintenance and transferred to the host installation's main hazardous waste storage facility. Any hazardous waste generated would be handled in accordance with appropriate Federal, state, and local regulations. The appropriate hazardous waste management plan would be developed for the site.

Pollution Prevention. A stated objective of the NMD program is to seek opportunities to eliminate or minimize use of hazardous materials throughout the life cycle of the program. The NMD program has generated a Pollution Prevention Plan which outlines strategies to

minimize the use of hazardous materials including Class II ODSs and EPCRA 13 chemicals. This plan will be applied throughout the design of all NMD elements, incorporating trade studies and emphasizing reduction of hazardous materials to be used on government installations.

Installation Restoration Program. Since the exact locations of the IFICS Data Terminals have not been selected, the presence of IRP sites on or near the proposed sites is not currently known. Before the final site selection for IFICS Data Terminal structures, a preliminary assessment will be performed to determine the potential for contamination and the need for further remedial investigation and remediation. NMD construction would be designed to avoid potential areas of concern in order to avoid interference with potential remedial activities and would be coordinated with appropriate Federal and state regulatory officials.

Radon. Where radon testing at potential IFICS Data Terminal sites reveals concentrations above the U.S. EPA threshold of 4 picocuries, the design of the NMD facilities would take into account mitigation measures to reduce radon levels in the buildings.

Pesticides. During the IFICS Data Terminal operational maintenance, pesticides may be needed within the site. The use of pesticides would be in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act. Local installation personnel would be contacted for appropriate materials that should be used for the region.

Cumulative Impacts

Potential cumulative hazardous materials and hazardous waste impacts could occur with the combination of IFICS Data Terminal activities and ongoing and future hazardous materials and hazardous waste management activities. Overall, it is not expected that there would be any cumulative hazardous materials or hazardous waste management issues given the small amounts of these materials used and generated.

Mitigation Measures

No mitigation measures would be required.

4.3.3.6 Health and Safety

IFICS Data Terminal health and safety impacts are evaluated by determining the processes in the NMD deployment that have the greatest potential for damage or injury. The primary health and safety issue associated with IFICS Data Terminal operation is EMR health impacts to the public and workers. EMR impacts to biological resources are addressed under that resource area. Possible EMR impacts could include public and worker exposure that exceeds standards, ignition of explosive devices, and effects to critical communication systems.

The potential for EMR exposure and general construction-related health and safety issues is common to any deployment location. Therefore, these potential health and safety issues are addressed below. Potential impacts related to construction worker exposure to asbestos, lead-based paint, and ground/water site contamination are addressed under Hazardous Materials and Hazardous Waste Management.

EMR

During normal NMD operations, the IFICS Data Terminal would not transmit except during annual testing of the equipment. It is expected that a power/calibration test of the transmitter would occur once a year. During this test, EMR would be generated by the IFICS Data Terminal. Based on ANSI C95.1, the personnel exposure limit for the IFICS Data Terminal operating frequency is 10 milliwatts per square centimeter for a 1.65-minute exposure. Based on the 1,500-watt IFICS Data Terminal, EMR levels would not exceed personnel exposure limits established by ANSI during the annual test. The remainder of the year, the IFICS Data Terminal would not generate any EMR.

The main concern with electromagnetic interference with the IFICS Data Terminal would be if other equipment would be within the main beam of the transmission or operating in the same frequency. Because there can be no obstruction of the IFICS Data Terminal main beam field of view, no other electronic equipment would be within the main beam transmission. In addition, very few other electronic equipment operates in the same frequency as an IFICS Data Terminal. The EMR from a IFICS Data Terminal would not affect electroexplosive devices.

Overall, no health and safety risks are expected from operation of an IFICS Data Terminal.

General Construction

The construction of the IFICS Data Terminal element would be conducted in accordance with the *Corps of Engineers Safety and Health Requirements Manual* and OSHA regulations. The construction of new facilities is routinely accomplished for both military and civilian operations

and presents only occupational-related effects on the safety and health of workers involved in the performance of construction activity. The siting of the IFICS Data Terminal and any related support facilities would be in accordance with DOD standards taking into account hazards of EMR to ordnance, EMR to personnel, EMR to fuel, ESQD, and other facility compatibility issues.

Cumulative Impacts

There are no health and safety risks associated with operation of an IFICS Data Terminal; therefore, no cumulative impacts should occur.

Mitigation Measures

No mitigation measures would be required.

4.3.3.7 Land Use and Aesthetics

This section addresses potential environmental impacts caused by changes to the land use or aesthetic environment due to the construction and operation of an IFICS Data Terminal. These impacts include potential effects from ongoing projects and activities at these sites. The following criteria were used to determine potential impacts:

- Construction of facilities or disturbance of land that may create conflicts with adjacent land use, zoning, or other planning regulations
- Compatibility with existing land use
- Construction or operational activities that may affect the visual environment

Currently, the location of the site has not been determined. However, due to this project only affecting such a small portion of land it should not drastically affect the land use regardless of where it is located. The NMD program would comply with all applicable Federal and state laws. In addition, exclusionary and evaluative siting criteria would be used to avoid or minimize conflicts with specially designated lands managed by Federal and state agencies. In other areas with high sensitivity land uses (e.g., residential and recreation) where proposed IFICS Data Terminals were not clearly incompatible with those uses, land use sensitivity and state and local land use regulations would be used as considerations for determining whether an impact would occur. The NMD program would coordinate with appropriate state and local agency personnel to identify siting issues and concerns, and would considered site-specific mitigations (e.g., site design, noise controls, or construction scheduling) as necessary to minimize potential impacts.

The visual impacts associated with the IFICS Data Terminal would relate mainly to the appearance of the facility. The new IFICS Data Terminal facility would be approximately 7 meters (20 feet) tall. The significance of visual impacts from a deployment site would depend on the sensitivity of the affected views, as well as visual dominance of facilities. Impacts could occur if the facilities were within views of medium to high sensitivity public use areas and travel routes. However, since it is anticipated that the IFICS Data Terminal would be located on a DOD installation with similar facilities and limited public access, few visual impacts would be expected.

Cumulative Impacts

Given the small area required for an IFICS Data Terminal cumulative land use and visual impacts would not be expected. Cumulative visual impacts could occur if the deployment site is located within a public view area along with other structures that obstruct vistas.

Mitigation Measures

Mitigations, if required, would be developed in consultation with Federal, state, and local land use planning agencies. These mitigations could include siting or designing the facilities to avoid land use incompatibilities. For areas near water such as the Western Aleutian islands, a Coastal Zone Consistency Determination would have to be prepared to determine that this project is consistent to the maximum extent practicable with the coastal management program. Visual impacts could be mitigated by siting the facility away from any public viewsheds.

4.3.3.8 Noise

Construction

In general, construction activity would not cause a significant noise impact since it would be short-term, would normally be limited to daytime hours, and would not constitute a health risk. However, there would be the potential for interference with human activity if sensitive land uses such as residences, schools, or hospitals were located near a deployment site. Therefore, exposure of such uses to short-term noise levels generally exceeding DNL equals 65 dBA would indicate the potential for adverse impacts. This could further be evaluated at the site-specific level, taking into consideration the noisiness of equipment that would actually be used, existing terrain conditions, and the type and location of land uses relative to the site.

With one exception, noise from potential construction equipment usually falls in the range of 70 dBA to 98 dBA at 15 meters (50 feet) from the source, with earth moving equipment, jack hammers, and rock drills being the noisiest pieces of equipment in this range. The one exception is pile drivers, which fall into the range of 95 dBA to 106 dBA at 15 meters (50 feet). Although a much shorter duration, initial construction of the IFICS Data Terminal could generate noise levels similar to those discussed for the GBI site in North Dakota. During the initial ground preparation activities the DNL equals 65 dBA and DNL equals 75 dBA contours are estimated to occur within approximately 0.55 kilometer (0.34 mile) and 0.16 kilometer (0.10 mile) from the construction site.

Operations

Operational noise from an IFICS Data Terminal would result from intermittent operation of a backup generator during testing which would occur for 2 hours each week and during commercial power outages. However, there is the potential that if the site is located in a remote area, full time generators could be used. Data for a 175-kilowatt generator enclosed in a shelter similar to that required for an IFICS Data Terminal was not available. However, noise measurements for a 150-kilowatt generator not within an enclosure developed noise levels of up to 80 dBA at 105 meters (344 feet). It would be expected that noise levels from an IFICS Data Terminal generator would be similar.

Cumulative Impacts

Short-term cumulative impacts could result if construction activities occurred concurrently with other construction activities nearby. In addition, long-term noise impacts could occur if the operational noise from the site combined with other existing noise sources to increase levels above recommended exposure levels for certain land uses.

However, given the intermittent nature of operational noise, cumulative impacts are not likely.

Mitigation Measures

The IFICS Data Terminal could be sited to avoid areas with sensitive noise receptors such as residences, schools, or hospitals.

4.3.3.9 Water Resources

Construction

The overall land requirement of this element could affect up to 7 hectares (17 acres) of land. Rainfall intensity, soil erosion, slope, vegetation, and erosion control measures all influence the rate of erosion. Site development would affect soil erosion through clearing and grubbing, when required, and the clearing for access roads if needed. It is expected that the site would be located on relatively level topography, where drainage patterns would only be altered slightly and surface water runoff and erosion would be minimal during the short duration of construction until surface vegetation is re-established. A minor increase of sediment in surface waters is possible, but not likely. The proposed site would be located to avoid the 100-year floodplain and any other significant water resource features.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.3.5, Hazardous Materials and Hazardous Waste Management.

IFICS Data Terminal construction activities could result in the disturbance of up to 7 hectares (17 acres) of land and would be subject to Federal NPDES permitting requirements. The water requirements for construction work and water for the construction workforce would be approximately 9,400 liters per day (2,483 gallons per day). The withdrawal of this amount of water would not be expected to impact most water supply aquifers and surface water sources.

Operation

The IFICS Data Terminal system would remain inactive until a missile attack, when a GBI would be launched to intercept an incoming ballistic missile. It also may be operational once a year for bore sight calibration. The operation of the IFICS Data Terminal would not create any water resources conflicts.

Cumulative Impacts

The IFICS Data Terminal would only affect approximately 7 hectares (17 acres). Future programs and previous activities at the site would not be expected to combine to create any cumulative water resources impacts.

Mitigation Measures

Potential impacts on water resources due to soil erosion would be mitigated by using Best Management Practices to reduce the potential for soil erosion during construction. Various measures may be recommended to reduce erosion of slopes, partially graded streets, and pads. Alternative recommendations may include minimizing the amount of area exposed during clearing; frequent watering of graded areas; use of soil stabilizers; and revegetation of slopes and open areas as soon as possible to enhance long-term stability.

4.3.3.10 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that Federal agencies identify and address disproportionately high and adverse environmental effects (including human, health, and economic and social effects) of its programs, policies, and activities on minority and low-income populations. An environmental justice impact would be a long-term health, environmental, cultural, or economic effect that disproportionately affected a nearby minority or low-income population, rather than all nearby residents.

As noted above, no environmental or human health impacts are anticipated from the operation of the IFICS Data Terminal. Environmental justice concerns related to subsistence and Native American concerns can not be identified until a specific site location is selected. However, given the small size of the site and its likely location on an existing military installation, no environmental justice impacts would be anticipated (e.g., the site could be moved to avoid any areas of concern). Any temporary construction-related impacts at any of the sites would be limited.

Cumulative Impacts

No environmental justice impacts have been identified for deployment of an IFICS Data Terminal; therefore, no cumulative impacts would occur.

Mitigation Measures

No mitigation measures would be required.

4.3.3.11 Subsistence

IFICS Data Terminal could be located in Alaska under the Proposed Action and would be subject to review for potential impacts to subsistence resources. The exact location of this proposed project has not been determined, but regardless of the potential location, it would only affect an area of up to 7 hectares (17 acres). This activity should not create any changes to subsistence activities or significantly reduce habitat of subsistence species. Existing hunting and fishing could continue as normal near the site.

Cumulative Impacts

Given the limited area required for an IFICS Data Terminal it is not anticipated that cumulative impact would occur. If the IFICS Data Terminal is constructed in an area where other development has reduced the amount of area allowed for subsistence use, there is the potential that cumulative impacts could occur. The IFICS Data Terminal would be sited to avoid heavy subsistence use areas.

Mitigation

Through the siting process, the IFICS Data Terminal could be located to avoid subsistence use areas.