# 2.0
# DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

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## 2.1 PROPOSED ACTION

**GMD VOC Test Site Overview**

The GMD VOC activities would be used to prove construction techniques for GMD components and validate the operational concept of GMD. Figure 2-1 graphically depicts the potential GMD test locations and site components. The activities and functions to be tested and verified during construction and operations include construction techniques, procedures, and methods, component installation and checkout, component assembly, maintenance in a realistic environment, and the ability to effectively command, control, and communicate among test components.

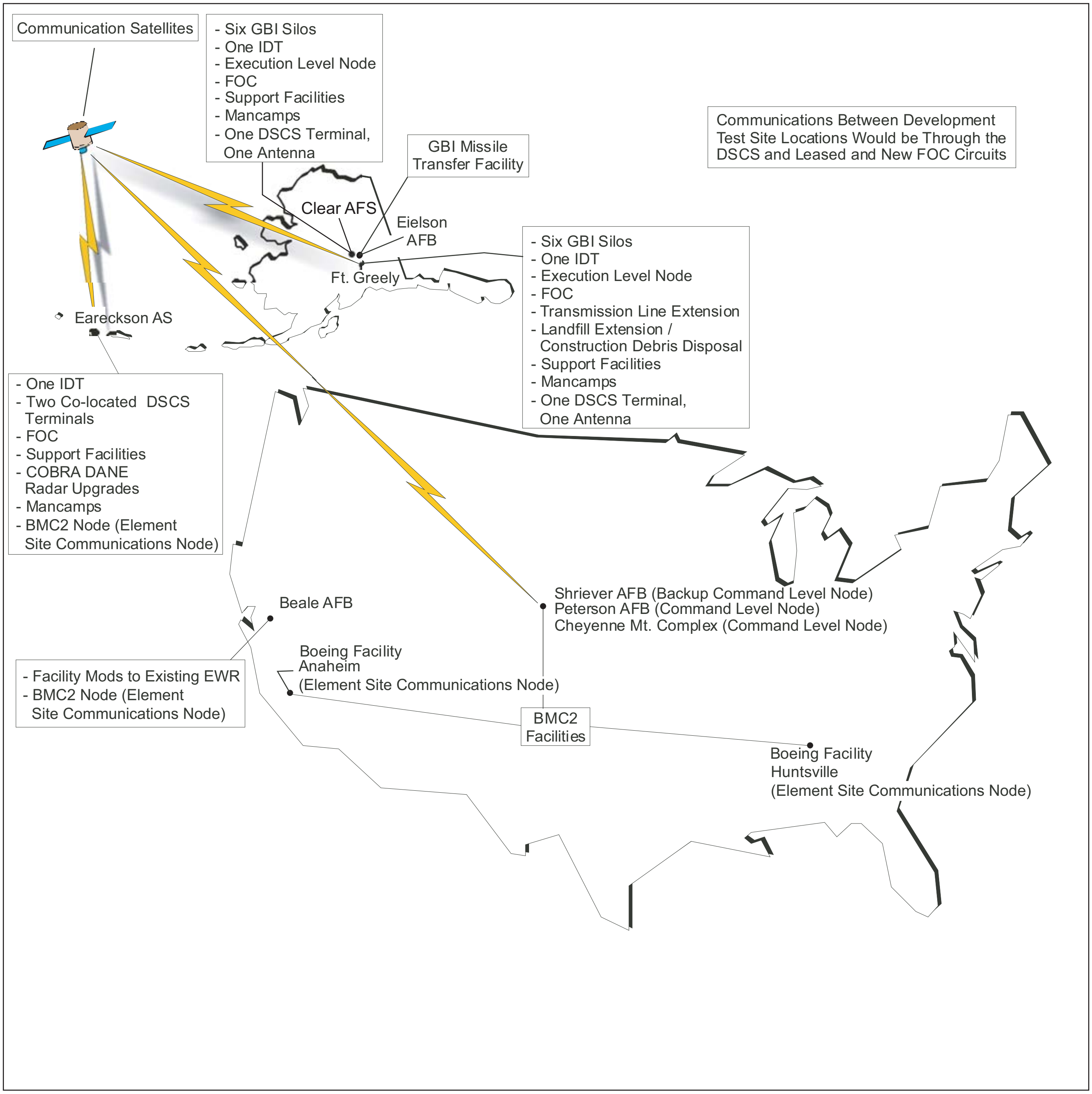
## 2.2 GMD VOC TEST SITE COMPONENTS

### 2.2.1 GROUND-BASED INTERCEPTOR

As described in the NMD Deployment Final EIS (Department of Defense, 2000), the mission of the GBI is to intercept incoming ballistic missile warheads outside the earth's atmosphere and destroy them by force of impact. The GBI missile has two main components: the Exoatmospheric Kill Vehicle (EKV) and a booster. No explosives or nuclear warheads would be used. The GBI VOC test site would include six silos, MAB, interceptor storage facilities, EKV Assembly and Checkout Facility, and associated support equipment, facilities, and personnel.

The amount of propellant could be more per interceptor than that analyzed in the NMD Deployment EIS, but the total propellant amount for the test activities would be much less than that contained in the 100 missiles analyzed in the NMD Deployment EIS. Each EKV would contain less than 19 liters (5 gallons) of liquid hypergolic propellants, the same amount and type of liquid propellant (hydrazine and nitrogen tetroxide) as that described and analyzed in the NMD Deployment EIS.

The NMD Deployment EIS described the integration of the entire GBI (rocket boosters and EKV) into a canister (creating a Canisterized Air Vehicle [CAV]) at an integration facility before shipment to the deployment site. Because of a potential change in the interceptor design configuration since the NMD Deployment EIS was published, there are now three revised concepts for integration of the GBI: (1) The GBI may arrive at the GBI field totally assembled and fueled in the CAV as discussed in the NMD Deployment EIS; (2) the GBI and EKV components may arrive uncanisterized at the GBI field to be assembled on site; or (3) the GBI may arrive canisterized with the un-fueled EKV attached requiring the




**EXPLANATION**

BMC2 - Battle Management Command & Control
DSCS - Defense Satellite Communication System
EWR - Early Warning Radar
FOC - Fiber Optic Cable
GBI - Ground-based Interceptor
IDT - In-Flight Interceptor Communication System Data Terminal
(lightning symbol) - DSCS Communications

NORTH

Not to Scale

# Potential GMD Test Locations and Site Elements

**Figure 2-1**

bi-propellant (fuel and oxidizer) tanks to be installed in the MAB or EKV Assembly and Checkout Facility.

This EA incorporates the analysis of the NMD Deployment EIS as it applies to the CAV, and will analyze the potential impacts associated with an interceptor that would need to be partially or wholly assembled on site.

The interceptor boosters and unfueled EKV would be transported by air to the GBI VOC test site if an adequate runway is available at the site, then transported to the military installation by truck to the MAB and EKV Assembly and Checkout Facility. If no adequate runway is available at the GBI VOC test site the interceptor boosters and unfueled EKV would be transported by air to Eielson AFB. The interceptor boosters and components may be temporarily stored in a proposed Missile Transfer Facility at Eielson AFB (see section 2.2.5) before being trucked to the GBI VOC test site.

If a runway is not available (due to weather, etc.), transportation would be by an alternate approach of sea and land. The EKV bi-propellant tanks and large GBI related items (e.g., silos and silo liners) could be barged to Valdez, Alaska then transported over land by truck, transported from the manufacturer by truck, or shipped by rail; however, the shipping method has not been determined. The bi-propellant tanks would be stored in the EKV Fuel and Oxidizer Storage facilities until mounted onto the EKV subassembly. GBI components, sub-components and all fuels would be transported in accordance with U.S. Department of Transportation, U.S. Air Force, and U.S. Army regulations.

**Construction**

The GBI VOC test site would contain the GBI silos, a MAB, three Interceptor Storage Facilities, an EKV Assembly and Checkout Facility, EKV fuel and oxidizer storage facilities, and additional support facilities. Construction would require up to 162 hectares (400 acres). Table 2-1 provides an overview of the GBI facility requirements. The final facilities designs, interceptor configuration, and layout of the test site have not yet been completed. Because of this, some slight changes to the final facility requirements and site layout are possible. Changes of this nature, however, are unlikely to result in meaningful differences in potential environmental impacts. Final plans will be reviewed and compared to this EA prior to issuing a notice to proceed with construction work.

Six silos would be constructed at the GBI VOC test site. Five silos would be used for static ground testing. The sixth silo would be used for testing and training that could not be performed on a missile with live ordnance. The sixth silo would also provide a location for evaluation of modifications or upgrades to the silo design during the development and testing process, without disrupting ongoing tests in the other five silos containing GBIs. If a decision were made to incorporate the design modifications or changes, the sixth silo would accommodate the work without disturbing the other five. A GBI could then be moved from one of the other five silos into the new modified silo. The newly emptied silo could then be modified and tested and then the process would continue until the remaining silos are upgraded and the GBIs re-loaded. The sixth silo would also be used if one of the other five silos is inadvertently damaged and in need of repair. The GBI in the damaged silo would be moved into this spare silo until necessary repairs are completed. Although some handling of the missiles in the silos is necessary, the sixth silo would minimize unnecessary handling in the other five silos.

**Table 2-1: GBI New Facility Requirements**

| Facility | Facility Requirements[1] | Facility Activities |
|---|---|---|
| Missile Silos[2] | 6 silos | GBI placement area |
| Missile Assembly Building | 1,207 square meters (13,000 square feet); | Interceptor component receiving, assembly, and checkout area |
| Interceptor Storage Facilities [2] | 3 structures at 418 square meters (4,500 square feet) each | Provide storage for GBI and parts |
| EKV Assembly and Checkout Facilities | 836 square meters (9,000 square feet) | EKV receiving, assembly, and checkout area |
| EKV Fuel/Oxidizer Storage Facilities | 2 structures at 88 square meters (950 square feet) each | Provide storage for EKV hypergolic fuel and oxidizer |
| Entry Control Station[2] | 372 square meters (4,000 square feet) | Security entry point |
| Readiness and Control Station[2] | 2,323 square meters (25,000 square feet) | Operational center for GBI complex, includes a BMC2 Execution Level Node |
| Mechanical/Electrical Building[2] | 1,115 square meters (12,000 square feet) | Provide a blast-resistant enclosure space for mechanical and electrical support systems |
| Electrical Substation[2] | 139 square meters (1,500 square feet) | Provide site electrical power |
| Utility Building | 316 square meters (3,400 square feet) | House switchgear and provide heated water |
| Water Supply Building[2] | 279 square meters (3,000 square feet) | Provide site water supply |
| Fuel Storage Area | 2 aboveground storage tanks at 113,562 liters (30,000 gallons) each | Provide storage for boiler and backup power generator diesel fuel |
| Fuel Unloading Area[2] | 46 square meters (500 square feet) | Provide safe fuel unloading area outside explosive safety zones |

[1] Facility size is approximate. Facilities will be separated in accordance with DoD requirements.
[2] GBI facilities analyzed in the NMD Deployment EIS

The NMD Deployment EIS described and analyzed many of the GBI facilities that would also be required at the GMD VOC test site. These facilities are listed in table 2-1; the NMD Deployment EIS analysis of these facilities is incorporated by reference. The impacts of these facilities are included in the cumulative impacts analysis of this EA.

**Operation**

The GBI VOC test site operations could include missile assembly and checkout; installation of the EKV bi-propellant tanks onto the EKV; inspection of the tanks after installation; installation/pressurization of pressure vessels on the EKV; final inspections, testing, and checkout of the loaded EKV assembly; integration of the EKV with the booster; and placement of the interceptor into the silo. The EKV may be integrated with the booster in the silo. It also may be integrated with the upper booster stage prior to integration with the remainder of the booster.

Assembly and checkout operations on the EKV such as testing pressure vessels for leaks, installation of the bi-propellant tanks, checking electronics and wiring, and final testing of the loaded EKV could be performed in the EKV Assembly and Checkout Facility. Assembly and checkout operations on the interceptor missile such as installing and checking electronics, wiring, and ordnance, mating to EKV, and final acceptance checks could be performed in the MAB. Once verified and checked out, the interceptor would be transported to the missile field site and inserted into the silo by crane or other handling equipment. Depending on the final interceptor design, some booster integration activities could also be performed in the silo.

Once placed, the interceptors would remain in the underground silos at the GBI VOC test site, except for removal for maintenance or because of upgrades or modifications to the silos. Typical tests performed at the GBI VOC test site with the GBI and other components would include hardware and software functions, component data communications interfaces, systems interfaces, and pre-mission or integrated mission test support functions. Equipment reliability in a realistic environment and maintenance concepts could also be evaluated. Some testing would also be performed on the interface between the missile and the EKV while it is in the silo. As previously discussed, there would be no flight testing of the missiles during test activities analyzed in this EA. Should it be determined that conducting a small number of checkout flights from the GBI VOC test site is feasible and would be useful to validate the deployment concept, supplemental environmental analysis would be performed as appropriate.

The GBI VOC test site would use utilities supplied by an offsite commercial supplier for environmental control of the silos, GBI storage, and activities associated with readiness. A backup battery system and onsite backup generators would supply emergency power. Generators for various GBI VOC test site-related facilities would range in output from approximately 30 to 1,650 kilowatts (kW). Each generator would also have its own dedicated aboveground (fuel) storage tank (AST). These dedicated tanks would range in capacity from approximately 1,890 to 34,065 liters (500 to 9,000 gallons).

Small amounts of hazardous materials usage would be associated with the GBI VOC test site activities. These materials would include protective coatings, lubricants and oils, motor and generator fuels, cleaning agents (isopropyl alcohol), backup power batteries, adhesives, and sealants used in periodic inspection and preventative maintenance to interceptor support systems, such as power supplies, environmental control systems, communications systems, and security systems.

Liquid propellant (consisting of the fuel and oxidizer) would be used in the GBI EKV. These materials would be contained in tanks installed on the EKV and would not be released at the test site except in the unlikely event that a system leak occurred.

**Safety Systems**

Specific safety plans would be developed to ensure that each operation is in compliance with applicable regulations. General safety measures would be developed by the facility user to ensure that the general public and site personnel would be provided with an acceptable level of safety. The main safety requirements for the GBI VOC test site are listed below.

*Fire Protection*

Fire protection, alarm, and suppression systems would be provided to GBI VOC test site facilities as appropriate.

*Security*

Security requirements would be an integral component of program safety. Security measures would be incorporated within the project design and operation procedures. Components of test site security would include a perimeter security fence, clear zone, security lighting, security standby power, intrusion detection system, and security patrol roads. The clear zone on the inner side of the fence would contain remotely operated lights and cameras. All vegetation would be cleared inside the security fence. Vegetation would be cleared to approximately 15 meters (50 feet) outside the security fence.

*Quantity-Distance Criteria*

DoD Explosive Safety Quantity-Distance (ESQD) criteria are used to establish safe distances from explosive hazard areas to non-related facilities and roadways in accordance with DoD Directive 6055.9, *DoD Ammunition and Explosives Safety Standards*. For analysis purposes, the ESQD for the GBI silos, the MAB, and the interceptor storage facilities was based on a distance up to 503 meters (1,650 feet) from inhabited buildings. The ESQD for the EKV Assembly and Checkout Facility and liquid propellant storage facilities was based on a distance up to 183 meters (600 feet) from inhabited buildings. Actual ESQDs may vary based on final facility design.

**Mancamps and Support Facilities**

Currently, there may be a requirement for mancamps at one or more of the VOC sites. Existing housing, dining, and recreation resources would be used if available. The contractors selected to perform the construction may provide housing for their workers at an off-site location that the contractor selects.

The mancamps could provide office space; housing units; dining facilities; a medical treatment area; and morale, welfare, and recreation activities such as fitness and television rooms.  The mancamp areas may be fenced and gated with controlled access to restrict entry.

The mancamp sites would be prepared by clearing, hauling of gravel fill, leveling, and compaction.  Roads and parking areas would be created with gravel fill and drainage ditches.  Lighting would be installed for security and parking.  Headbolt heaters would be provided as required at parking locations to prevent vehicle engines from freezing.  Utility services would be provided by the Government or commercial sources and would be brought into the sites with minimum connectivity.  Facility units would be erected on pedestals or block foundations.  Covered walkways would be constructed to provide protection from the winter conditions between buildings.  The units and related material would be transported to the military installation or off-site location by air, sea, land, or rail.

It is anticipated that mancamps would be installed prior to the start of construction.  The mancamps could be expanded as necessary should additional personnel arrive to work at the test site.  Mancamp units would be temporary structures and would be removed when no longer needed.

### 2.2.2 BMC3

BMC3 is the integrating and controlling component for the GMD test locations and facilities.  It includes the equipment, communications, operations, procedures, and personnel essential for planning, directing, and controlling assigned assets required to accomplish the GMD mission.  BMC3 provides mission and engagement planning, and situation assessment, and directs system responses.  The BMC3 comprises three sub-components:

- BMC2 provides the command and control planning, tasking, threat analysis, and decision aids.  An Execution Level BMC2 Node would be located at the GBI VOC test site and would provide backup communications between the Command Level Node which provides the command and control planning, tasking, threat analysis, and decision aids to support the GMD test activities (including an ability to support conduct of integrated flight tests as is currently accomplished from the Reagan Test Site at Kwajalein).  The Element Site Communication Node provides communications between GMD components.
- The IDTs provide communications links between the BMC2 function and the in-flight interceptor for target updates and status communications.
- The GCN provides the communications links between GMD components and the network management and interfaces to external systems.

#### 2.2.2.1 BMC2 Node Locations

The potential locations of the BMC2 Nodes that would be required to support the GMD test activities would include the following (figure 2-1).

- Peterson AFB, Colorado (Command Level Node workstation)
- Shriever AFB, Colorado (Command Level Node workstation)
- Cheyenne Mountain Complex, Colorado (Command Level Node workstation)
- Boeing Facility, Anaheim, California (Element Site Communications Node workstation)
- Boeing Facility, Huntsville, Alabama (Element Site Communications Node workstation)
- Beale AFB, California (Element Site Communications Node workstation)
- Eareckson AS, Alaska (Element Site Communications Node workstation)
- GBI VOC Test Site (Fort Greely or Clear AFS, Execution Level Node workstation)

One or all of the BMC2 Nodes identified above could be established as part of the GMD test activities. Establishing the BMC2 Nodes would require only minor modifications to existing facilities (as discussed in section 1.5), hardware and software upgrades, and connecting to existing FOC circuits.

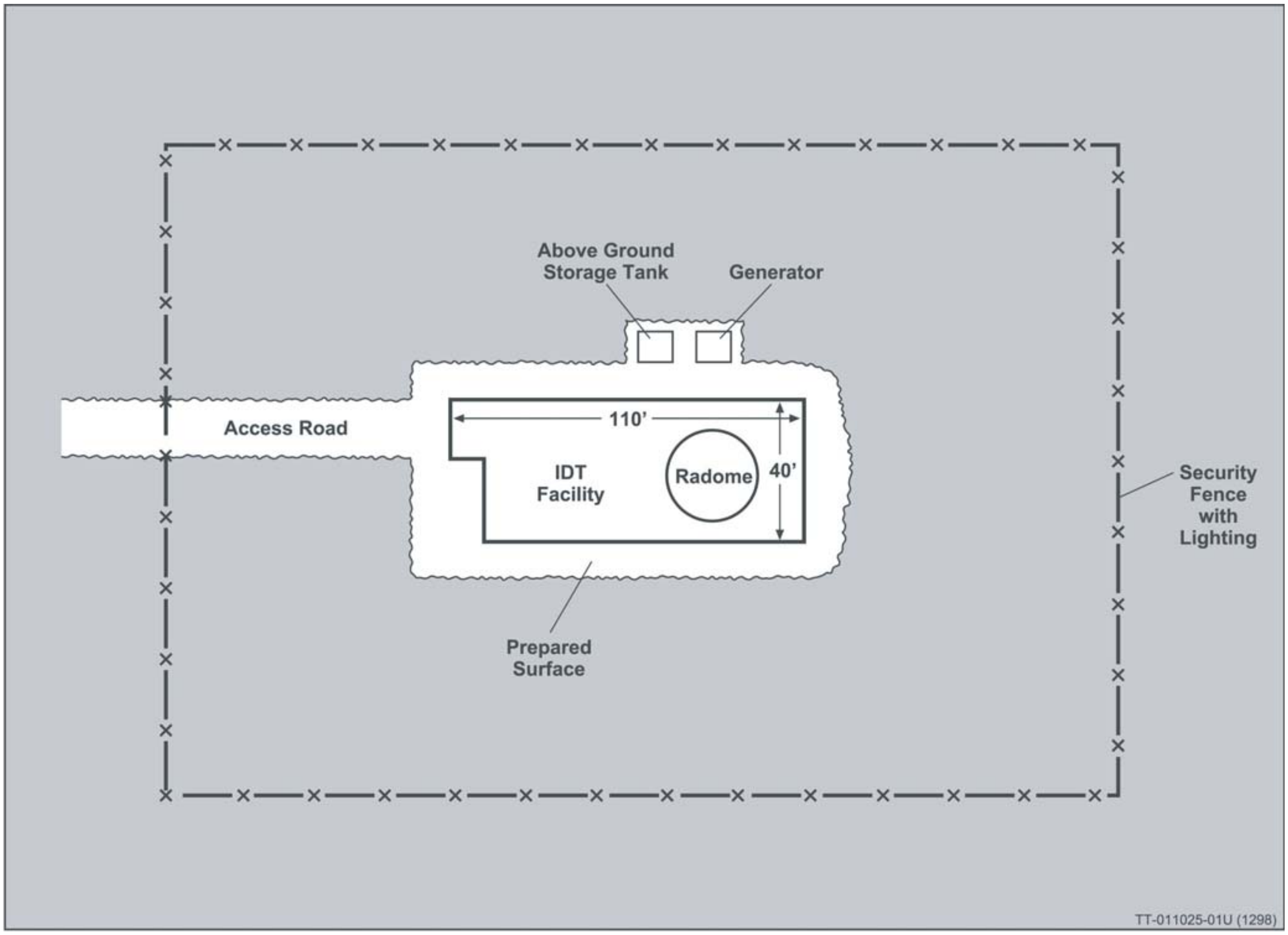
#### 2.2.2.2 IDT

The IDT is a remotely operated communication ground station, which is a sub-component of the BMC3. It provides an in-flight communications link between the BMC2 Node and GBI, and transmits target update information to the GBI. The IDTs would be geographically distributed to provide effective system performance.

The IDT would be contained in a building that is approximately 30.8 meters by 11.6 meters (110 feet by 40 feet) that would have a radome mounted on one end, and a weather vestibule (to include dual wind shelters) on the other end (figure 2-2). An external aboveground fuel tank and a generator for backup power would be located near the building.

**Construction**

The IDT would be built on a seismically rated concrete foundation. An all-weather road to the IDT site would be required. A prepared surface perimeter around the building, at least 4.5 meters (15 feet) wide, would be required for crane access and parking for two utility and maintenance vehicles (figure 2-2). Two 9-meter (30-foot) anemometer (wind speed indicator) towers would be installed within the IDT site. Security fencing would be required around the facility. Telephone circuits would be required for voice communications and alarm monitoring. Sewage at the IDT would either be disposed of through a septic tank system or through an existing sewer system. Sewage disposal would be site dependent.




## Conceptual IDT Site Layout

Not to Scale

**Figure 2-2**

If a septic tank system were used, it would be constructed in accordance with state and local requirements.

**Operation**

The IDT is a part of the BMC3 component and would provide communications links between the GBI missile and the BMC2 subcomponent. The IDT is a radio transceiver that would only transmit/receive when a GBI missile is being tested. Tests could occur on the radome support system during adverse weather conditions (temperature, wind, humidity, ice/snow loads), facility/equipment operability, and communication links. Power to an IDT site would be from commercial offsite sources. A 300-kW generator would supply backup power. An AST with a fuel capacity of 3,785 to 5,678 liters (1,000 to 1,500 gallons) would supply fuel to the backup generator. The backup generator would be tested for approximately 45 minutes every 2 months. The rights-of-way for the IDT would provide space for fire protection water and hot water supply and return lines and steam heat. Overhead lines would supply electrical power.

### 2.2.2.3 GMD Communication Network

The GCN sub-component of the BMC3 component would provide the communications link between the GBI VOC test site and other GMD locations in addition to providing network management and interfaces to external systems. The GCN sub-components include the DSCS and both existing and new FOC circuits. The GCN component would include one remotely controlled DSCS and the FOC required to link the components and sub-components of the GMD test location activities.

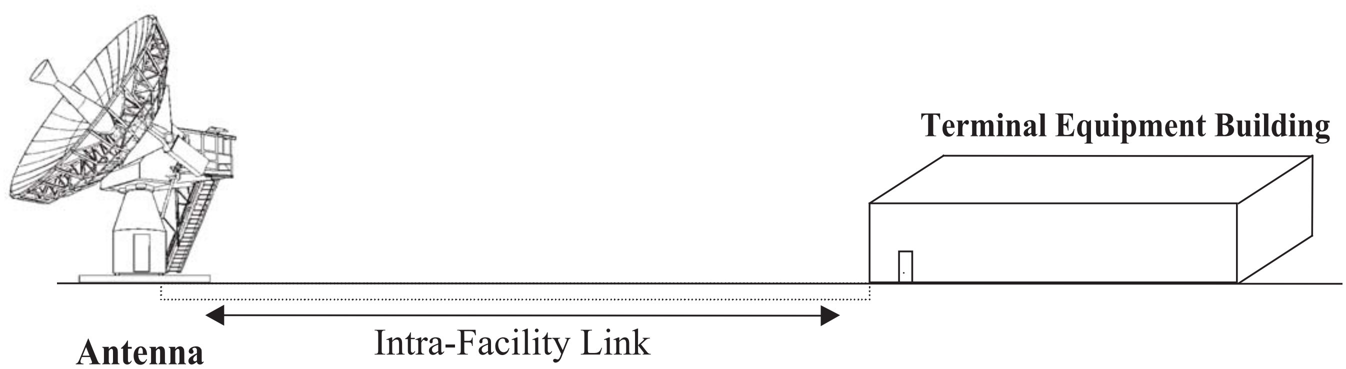
**Defense Satellite Communication System**

**Construction**

The DSCS earth terminal would consist of a satellite terminal (figure 2-3), an equipment building housing the communications enclosure, and backup power van (figure 2-4). The DSCS earth terminal would also have a dish antenna, protected by a radome, outside the equipment building. The equipment building would be sized to house a future Milstar communications van, a second power van, and an externally installed Milstar Extremely High Frequency Antenna Support Structure. Although a Milstar is not required for VOC purposes, one might be required if the GMD is deployed. Creating a building minimally larger than what is required for VOC would minimize the likelihood of having to construct another, separate building in the future. The current generation of Milstar satellite does not support the information data rates required, however, a new generation of advanced extremely high frequency satellite is under development. This capability would be more robust than DSCS and may supplement or replace the DSCS communications capability in the future. Security fencing would be installed around the facility. The primary power for the terminal would be commercial power. Water and sewer service would also be provided to the DSCS terminal. The DSCS terminal would have backup power for the critical load and standby power for the non-critical loads. The backup power system would be located in the equipment protection facility. A road would be required to provide vehicle access to the facility.

**Conceptual Defense Satellite Communication System**

**Figure 2-3**




EXPLANATION

Not to Scale

**Conceptual Satellite Communication System Site Layout**

**Figure 2-4**

**Operation**

The DSCS is capable of remote monitoring and control through a centralized control, monitor, and alarm system. The DSCS would be operated remotely from the Readiness and Control Station of the VOC test site location. The DSCS would provide satellite communications among Eareckson AS, the GBI VOC test site, and the BMC2 Command Nodes at other locations.

**Fiber Optic Cable**

**Construction**

The FOC network would provide the communications link between the components and sub-components of the GMD test sites. Existing FOC would be used whenever feasible. Where new FOC is required, cable may be installed on either side of rights-of-way (normally roads or railroad tracks). The FOC would be buried to a depth of approximately 1 meter (3 feet) from the surface. Manholes and covers would allow access to the cables for maintenance and for future cable installations.

To the extent possible, candidate cable routes were identified along existing rights-of-way, minimizing the impact on the environment.

**Operation**

The FOC system has three main operating components: a transmitter, a transmission medium, and a receiver. The FOC system uses light pulses to transmit information down fiber optic lines. The transmitter is the point of origin for information coming over fiber optic lines. It accepts coded electronic pulse information from a copper wire, and then processes and translates that information into equivalently coded light pulses. A light-emitting diode or injection-laser diode can be used for generating the light pulses. The light pulses are funneled into the fiber-optic medium, where they are transmitted down the line.

## 2.2.3 EARECKSON AS, ALASKA

Potential construction (18 months) and operation of one IDT, two co-located DSCS earth terminals, software and hardware upgrades to the existing COBRA DANE Radar, installation of FOC, refurbishment of the existing power plant, and establishment of mancamps and associated support facilities for the GBI VOC test site would be required for the Proposed Action. The COBRA DANE Radar is located at Eareckson AFS on Shemya Island in Alaska. Upgraded hardware and software can provide unique sensing (search, acquisition, and track) and classification information. For the purposes of validating the GMD operational concept, COBRA DANE would participate in ground testing and would interact as a radar sensor in Shemya with BMC3 test components. Its location also provides the potential to test the BMC3 portion of the GMD element using real-time, real-world targets of opportunity, such as test launches that are within the radar's field of view. This would test the ability of the BMC3 to integrate and effectively use real-world data processed by the upgraded COBRA DANE as part of the GMD VOC test bed. The hardware and software upgrades, and related facility modifications would take place entirely within the COBRA DANE facility and would involve changes to lower level electronics and signal and data processing. The modifications would not result in any change to maximum radar output.

#### 2.2.3.1 IDT

**Construction**

One IDT would be constructed at Eareckson AS to support the GMD VOC test site activities. The IDT site 2, located in the north central part of the island, is the preferred site (figure 2-5). One alternate IDT site was also identified during the siting process and is located in the southeast part of the island. A construction laydown area may be located adjacent to the IDT building location. Trenching from the IDT to the power plant would be along existing roads or rights-of-way.

**Operation**

The IDT would provide communications links among the GMD components as described in section 2.2.2.2.

#### 2.2.3.2 GMD Communications Network

The GCN sub-component at Eareckson AS would provide the communications link between all other sub-components of the GMD. The GCN component at Eareckson AS would include two co-located remotely controlled DSCS earth terminals and FOC.

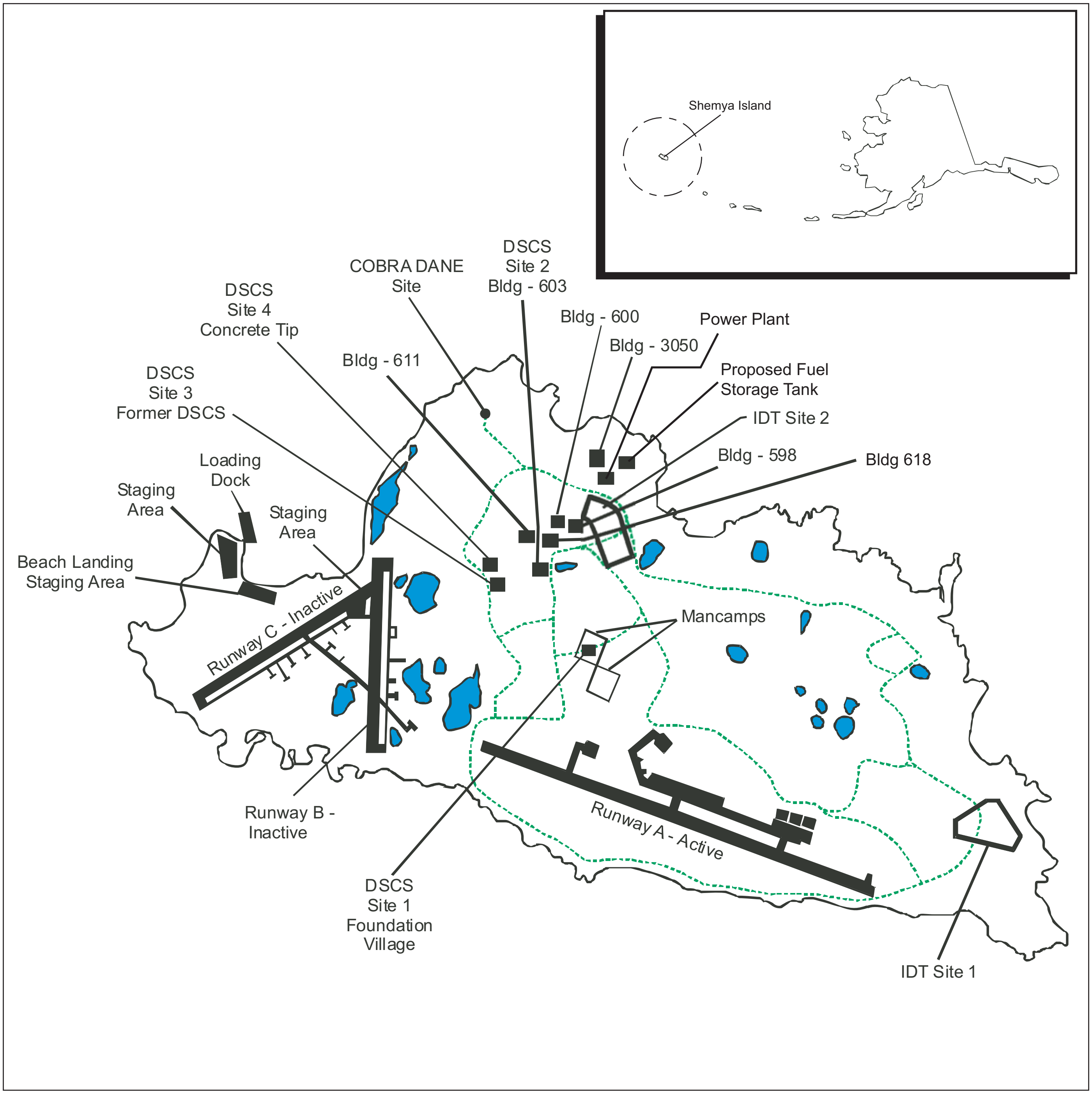
**Defense Satellite Communication System**

**Construction**

At Eareckson AS, the two co-located DSCS earth terminals would be constructed and installed at DSCS Site 1, Foundation Village, located in the center of the island (figure 2-5). Site 1 is the preferred site. The earth terminal complex would contain a single equipment building housing two communications enclosures and two backup power generators. The primary power for the terminal at Eareckson AS would be provided by the existing power plant. The DSCS terminals would have organic backup power for the critical load and standby power for the non-critical loads. The organic backup power system would be located in the equipment protection facility. Equipment would be added to the existing communications room of Building 618 to support this upgrade. A road would be required to provide vehicle access to the facility. A construction laydown area may be located adjacent to the DSCS terminal location. Three alternate DSCS terminal sites on Eareckson AS were identified during the siting process. Figure 2-5 also shows the alternate DSCS terminal sites 2 through 4.

**Operations**

The DSCS terminal is capable of remote monitoring and control through a centralized control, monitor, and alarm system. The DSCS would provide satellite communications between components and sub-components during GMD test activities.




**EXPLANATION**

Proposed Fiber Optic Cable (FOC) Route

**Conceptual Test Facility Locations**

Eareckson Air Station, Shemya, Alaska

NORTH

Not to Scale

**Figure 2-5**

#### Fiber Optic Cable

**Construction**

FOC construction at Eareckson AS would be the same as described in section 2.2.2.3. Figure 2-5 shows the proposed FOC routes for Eareckson AS. This proposal is for terrestrial FOC only and does not include any routing of submarine FOC.

**Operations**

The FOC operations at Eareckson AS would be the same as described in section 2.2.2.3.

### 2.2.3.3 COBRA DANE Radar

COBRA DANE is a single faced, L-band, large phased array radar located at Eareckson AS. The primary purpose of the radar, shown in figure 2-6, is to detect and track foreign intercontinental ballistic missile and submarine-launched ballistic missile objects. The system provides 120-degree coverage of a 3,220-kilometer (2,000-mile) corridor that spans the eastern Russian peninsula and northern Pacific Ocean. Construction of the system started in 1973, and the COBRA DANE phased array radar became operational in August 1977. The COBRA DANE radar is housed in a 33.5-meter (110-foot) high building. The active portion of the array resides in a circle with a 28.8-meter (94.5-foot) diameter. COBRA DANE operates in the 1,215 to 1,400 megahertz (MHz) band and generates approximately 15.4 megawatts (MW) of peak radio frequency (RF) power (0.92 MW average) from 96 traveling wave tube amplifiers arranged in 12 groups of 8. This power is radiated through 15,360 active array elements, which together with 19,408 inactive elements compose the 28.8-meter (94.5-foot) diameter array face. The antenna is oriented approximately toward the west, monitoring the northern Pacific test areas.

The COBRA DANE system was upgraded between 1990 and 1993 under the ESC/ICR (Hanscom AFB) COBRA DANE System Modernization program. The modernization upgrade involved replacing aging and unsupportable radar, computing and communications interface equipment, and all automated data processing equipment and recording peripherals. The majority of the transmitter, array, and facilities subsystems remained intact. All operations software was rewritten and enhanced using the Ada computer language.

**Construction**

The proposed modifications to the COBRA DANE facility, Building 4010, would include the addition and replacement of electronic hardware and computer software and alterations to the interior of the building. No exterior modifications or ground-disturbing activities are anticipated. Interior walls would be moved to accommodate new equipment.

**Operation**

The Proposed Action is to incorporate the GMD mission into the current computer software at the existing COBRA DANE in support of GBI VOC test site activities. The upgraded radar would also be able to provide simulated target data in combination with the existing ground based radar prototype at the Ronald Reagan Ballistic Missile Test Site at the Kwajalein Atoll in support of test activities. The hardware modifications required for the

**COBRA DANE**

Shemya, Alaska

**Figure 2-6**

test activities would consist of adding communications, test electronics and Automatic Data Processing enhancement (VAX) to a 4-Central Processing Unit configuration with memory expansion to 256 megabytes. The modified software would incorporate the GMD object test tracking and reporting, and BMC3 communications interplay. The upgrades to hardware and software would not change the power input or output of the COBRA DANE.

Once upgraded, the current mission and operations would continue, but with the new additional role of supporting GMD test activities. During routine Space Track operations (24 hours a day, 7 days a week), the radar normally operates at a reduced/limited duty factor of 1.5 percent. To allow the radar to collect the maximum data possible during tracking, the radar automatically runs-up and operates at its full duty cycle of 6.0 percent for the approximately 15-minute event. After the last tracked object has left its field-of-view, the radar then automatically runs back down and operates at its limited duty factor. However, the radar as designed can operate at its full duty cycle for 24 hours a day, 7 days a week. It is routinely operated at a limited duty factor to reduce the overall diesel generator maintenance and diesel fuel cost for the Shemya Power Plant. It is anticipated that during GMD test events, the radar would operate at its full duty factor of 6.0 percent. Support of GMD test events would increase the number of personnel assigned to the radar. The additional GMD test periods could increase radar equipment repair and the materials used and waste generated in maintaining the COBRA DANE system. It is anticipated that training for the test activities would be less than 1 percent of the total usage.

#### 2.2.3.4 Refurbishment of Existing Power Plant

The U.S. Air Force is currently overhauling five of the six existing generators. The GMD Program Office anticipates reworking the control system and mechanical system of the power plant to increase reliability. Repairs would be made to the foundation of the sixth generator, and then it would be overhauled as well. It is anticipated that a 9.5-million-liter (2.5-million-gallon) fuel tank would be installed and connection made into the existing piping system. No increase in electricity producing capacity of the power plant is anticipated.

Currently, Eareckson AS is classified as a major emissions source and the U.S. Air Force maintains a Title V Air Permit issued by the Alaska Department of Environmental Conservation (ADEC). The refurbishment of the power plant would not increase or change fuel consumed or pollutants emitted.

#### 2.2.3.5 Mancamp, Administrative and Support Facilities

**Mancamp**

Construction workers may be housed in the existing facilities in Building 598, or may require a temporary mancamp. If a temporary mancamp is required, it would be established in the vicinity of Foundation Village near the center of the island (figure 2-5). The mancamp would provide living accommodations for the Prime Contractor and U.S. Army Corps of Engineer's construction contractors for a minimum of 35 and a maximum of 200 personnel. Personnel housed in the mancamps would use the existing dining facilities at Eareckson AS. With the exception of the dining facility, the Eareckson AS mancamp could be similar in design to the mancamp described above in section 2.2.1. It would most likely consist of trailers or portable buildings. The size and composition of the mancamp would be determined by the number of construction contractors.

The mancamp site would be prepared by clearing, hauling of gravel fill, leveling, and compaction. Roads and parking areas would be created with gravel fill and drainage ditches. Selection of the mancamp site would avoid damage to crowberry, the main Fall food for the Aleutian Canada goose, to the extent practicable. Lighting would be installed for security and parking. Facility units would be erected on pedestals or block foundations provided by the housing vendor, and portable toilets could be required temporarily. Covered walkways would be constructed to provide protection from the winter conditions between buildings.

Utilities would be provided from on-island resources, and the mancamp would be established in compliance with all applicable statutes and regulations. However, portable latrines may be required.

**Administrative and Support Facilities**

The Proposed Action at Eareckson AS would include the use of the following existing facilities and indicated activities (figure 2-5):

- Building 500—Construction material storage
- Building 521—Equipment and construction material storage
- Building 598—Housing; refurbishment would include heating repair, re-painting and re-carpeting, and installation of a sprinkler system.
- Building 600—Office space; housing, general refurbishment, and operation of an Element Site Communication BMC2 Node
- Building 605—Vehicle storage
- Building 611—Electronics maintenance shop (room 103)
- Building 616—Vehicle and equipment maintenance and storage
- Building 618—Communication equipment
- Building 3050—Warehouse, office space, and IDT assembly area; general refurbishment

Support facilities and related staging areas would be required to temporarily store equipment and materials required for construction and operation of the GMD test facilities. Three staging areas would be used at Eareckson AS and are located at the western end of the island near the loading dock and inactive runway (figure 2-5). Additional laydown and staging areas would be used at the components' construction sites and adjacent to the facilities listed above. These areas are located on previously disturbed ground. Administrative and storage areas at the COBRA DANE may also be used.

### 2.2.4 BEALE AFB, CALIFORNIA

The proposed modifications to the existing Beale AFB EWR would include new software and hardware, and interior building modifications to accommodate the new hardware. The EWR as upgraded would be referred to as the UEWR. The proposed hardware and software modifications were analyzed in Appendix H, "Upgraded Early Warning Radar Analysis," of the NMD Deployment EIS. This analysis is incorporated by reference. Upgrading the software and hardware of the existing EWR would allow the program to test the effectiveness of improved algorithms for acquisition, tracking, and classification. This would include evaluation of the ability of the BMC3 component to integrate and effectively use data supplied by the proposed UEWR to the GMD VOC test site.

The proposed UEWR would be the initial search and track component of GMD VOC testing and could be used in a simulated mode to test the interoperability of the GMD VOC components. Proving interoperability is an essential part of the validation of the operational concept. The proposed UEWR at Beale AFB could also provide vital information for tests currently being performed on existing test ranges in support of other GMD activities. The UEWR could pick up signatures from standard target missiles launched from Vandenberg AFB, an existing test range, over the Pacific Ocean when the missile passes through the UEWR's surveillance fence. The upgraded computers and programming could then pass accurate identification and trajectory information on to a BMC3. The BMC3 could then cue the existing radar at Kwajalein with this information. The interceptor missile could then be launched from the existing test site on Kwajalein and directed to the target missile by the cued radar. The Beale UEWR could also participate in U.S. Air Force risk reduction flights launched from Kodiak in order to further test radar performance and interactions with BMC3.

Beale AFB is one of only three operating EWRs sites in the United States; the other two are Cape Cod AFS, Massachusetts and Clear AFS, Alaska. The Beale EWR was sited at its current location to maximize the ability to perform critical defense missions, including acquisition and tracking of ballistic missiles aimed at the United States. The location of the Beale EWR on the west coast makes it the only EWR that can provide full tracking coverage for GMD test activities.

The PAVE PAWS (PAVE is a U.S. Air Force program name, while PAWS stands for the Phased Array Warning System) EWR is a surveillance and tracking radar system operated by the U.S. Air Force at Beale AFB, California, (figure 2-7). The existing PAVE PAWS facility at Beale AFB has been operational since 1980. No substantial changes to the building infrastructure or personnel burden on the site would be required.

The PAVE PAWS radar is housed in a 32-meter (105-foot) high building with three sides. Two flat arrays of individual radiating elements transmit and receive RF signals generated by the radar. The equipment that generates the RF signals and then analyzes the reflected signals is housed inside the radar building. The two array faces are 31 meters (102 feet) wide and tilted back 20 degrees from vertical. The active portion of the array resides in a circle 22.1 meters (72.5 feet) in diameter in the center of the array. Each radiating element is connected to a solid-state transmit/receive module that provides 325 watts of

**PAVE PAWS**

Beale Air Force Base, California

**Figure 2-7**

power and a low-noise receiver to amplify the returning radar signals. The RF signals transmitted from each array face form one narrow main beam with a width of 2.2 degrees. Most of the energy (approximately 90 percent) is contained in the main beam.

As analyzed in the NMD Deployment EIS, the radiated peak and average power, and operating bandwidths of the upgraded EWR would remain unchanged from current operations of the EWR. The proposed modifications would not increase the output or duty cycle of the radar, and thus would not increase the total energy emitted during operation. Rather, instead of increasing system performance by increasing power, the electronic hardware and computer software replacements would effectively result in enhanced detection and discrimination capabilities. This GMD VOC EA incorporates that analysis and consequently will focus on the interior modification to accommodate installation of the new hardware and software.

The U.S. Air Force, which operates and has real property accountability over the PAVE PAWS EWR facilities, has begun the process for a separate NEPA analysis to determine the long-term status of all of the EWRs in the United States. The U.S. Air Force may not complete its NEPA analysis for several years. Upgrades to the Beale AFB EWR to support the test function of validating the GMD operational concept would not foreclose any action the U.S. Air Force determined to be appropriate, after completing its NEPA analysis. The UEWR would be able to search for different types of missiles and distinguish hostile objects (warheads) from other objects, and provide this data to other GMD components using improved communications systems.

**Construction**

The Beale AFB EWR facility would only require interior modifications. Current offices and a conference room would be modified for installation of the new equipment on the first, third, and fourth levels. A new Computer Maintenance Operations Center would be constructed in existing office space on the first level of the existing facility. After UEWR acceptance, the vacated spaces would be converted to replace the offices and conference room. Some modifications would also be made to existing radar and training equipment rooms to install new equipment.

The hardware modifications, analyzed in Appendix H of the NMD Deployment EIS, would consist of replacing existing computers, graphic displays, communication equipment, and the radar receiver/exciter to perform the GMD testing. The EWR software would be rewritten to incorporate the GMD test function and allow the improved acquisition, tracking, and classification of small objects.

**Operations**

Upgrading the computer hardware and software of the EWR at Beale AFB would effectively provide enhanced acquisition and tracking of target missiles for the proposed GMD test activities. Existing equipment would continue to function during the modifications. After the new hardware and software is tested and installed, the duplicate existing equipment would be removed.

Once upgraded, the current EWR operations would continue with the addition of conducting GMD test missions (i.e., identification and precise tracking of a test ballistic missile launched against the United States) and training exercises. During GMD test operations and training, radiated peak and average power would be identical to current EWR operations. In either case, the physical characteristics of the radar (radiated peak and average power, operating bands, etc.) would be the same whether EWR or GMD test operations are being conducted. During GMD test operations a different radar pattern would be used and different algorithms used to interpret the raw data from the radar returns. There would be no change to the number of personnel operating the radar or in the amount of hazardous materials and waste generated by the UEWR when compared to the EWR. It is anticipated that training for GMD test activities would be less than 1 percent of the total usage. At all other times, the UEWR would continue to perform its current EWR missions.

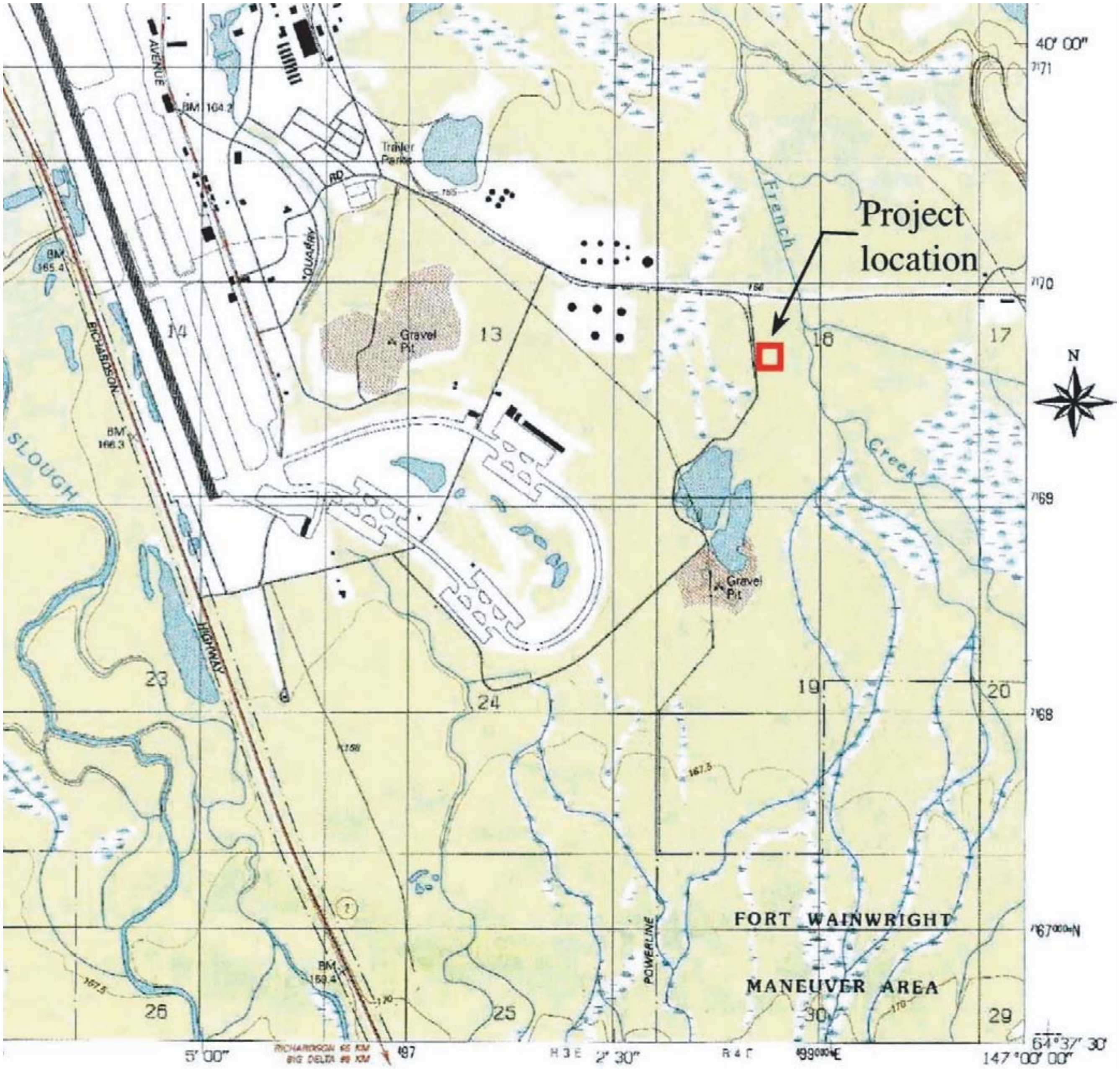
As stated above, the proposed modifications would not increase the output or duty cycle of the radar or increase the total energy emitted during operation. Instead of increasing system performance by increasing power, the electronic hardware and computer software replacements would effectively result in enhanced detection and discrimination capabilities.

### 2.2.5 EIELSON AFB MISSILE TRANSFER FACILITY

Most equipment and interceptor components could be flown by air transport into Eielson AFB near Fairbanks, Alaska. Upon arrival at Eielson AFB each interceptor would be transferred from the aircraft to a cargo loader for transport to the GBI VOC test site or movement to a Missile Transfer Facility to be constructed on Eielson AFB, as shown in figure 2-8. A Missile Transfer Facility would support cold weather loading/off loading and storage requirements of the interceptor and support equipment. Missiles would only be placed in the transfer facility if conditions exist which would not allow the missile to be transported immediately to the GBI VOC test site. The base master planning function initially proposed two locations for the Missile Transfer Facility. One of the two locations was located at the end of the Base's active aircraft runway. This location was determined to be unacceptable because of ESQD requirements for the missiles, which would be located in the transfer facility.

#### Construction

The Missile Transfer Facility would be constructed at a gravel parking/storage pad located off Mullin's Pit Road, approximately 1.6 kilometers (1 mile) from the runway on Eielson AFB. The location would also maintain the minimum ESQD separation from other facilities as required by U.S. Army, U.S. Air Force, and DoD regulations. The road from the runway to the new transfer facility would require resurfacing and portions would require straightening and/or widening. Lighting fixtures and a security fence would have to be installed around the transfer facility. The roads leading off base from the new transfer facility to Highway 2 (approximately 0.8 kilometer [0.5 mile]) would require resurfacing and its entrance would have to be modified. An 18-meter (60-foot) hardtop surface with a sliding 18-meter (60-foot) gate, lighting, and communication lines to the security forces must be available at the gate. A 36-meter (120-foot) emergency pull-off ramp on the




**EXPLANATION**

## Missile Transfer Facility

Not to Scale

NORTH

Eielson Air Force Base, Alaska

**Figure 2-8**

Richardson Highway (Route 2) would have to be installed so that the convoy and missile transporter could pull off the main highway for entry into Eielson AFB. In addition, several existing pull-offs could require minor modifications between Eielson AFB and the selected GBI VOC test site.

The pre-fabricated building would be large enough to accommodate two cargo loaders. The building would be approximately 30.5 meters (100 feet) long by 15 meters (50 feet) wide.

**Operation**

The Missile Transfer Facility would only be used to store interceptors and their parts on a short-term basis. The GBI would be transferred to a missile transporter inside the Missile Transfer Facility and then surface transported to the GBI VOC test site. Typically interceptors would only be stored overnight. The transfer facility would normally be unoccupied. The facility's power would be supplied by existing base power, but a generator would provide a backup power supply.

## 2.3 PREFERRED GBI SITE

The Preferred Alternative would be to construct and operate the GBI VOC test site at Fort Greely, Alaska and related support facilities at other locations as shown in table 2-2.

**Table 2-2: GMD VOC Preferred Alternative, One GBI Site with Six Silos**

| GBI | BMC2 | IDT | DSCS Terminal | Radar Support | Transportation | UEWR |
|---|---|---|---|---|---|---|
| Fort Greely | Fort Greely | 1 at Fort Greely | 1 at Fort Greely | COBRA DANE Eareckson AS | Allen Army Airfield Repair | Beale AFB |
| | Peterson AFB, Shriever AFB, Cheyenne Mountain Complex, Boeing Facilities, Beale AFB, and Eareckson AS | 1 at Eareckson AS | 2 co-located at Eareckson AS | | Missile Transfer Facility at Eielson AFB | |

### 2.3.1 GROUND-BASED INTERCEPTOR

**Construction**

The GBI VOC test site at Fort Greely could contain six silos, a MAB, three interceptor storage facilities, an EKV Assembly and Checkout Facility, EKV fuel and oxidizer storage facilities, and additional support facilities. Table 2-1 and figure 2-9 provide an overview of the GBI VOC test site facilities. An underground communication line currently on the west side of the GBI test site would be relocated outside the perimeter security fence. The final facilities designs, interceptor configuration, and layout of the test site have not yet been completed.

**Operation**

Assembly and checkout operations on the interceptor missile and EKV would be performed in the MAB and/or EKV Assembly and Checkout Facility. Typical tests performed at the test location would include component-level and component-to-component tests, hardware and software functions, component data communications interfaces, component interfaces, and pre-mission or integrated mission test support functions. As previously discussed, there would be no flight testing of the missiles during test activities analyzed in this EA. Table 2-3 provides a list of facility requirements for the GBI VOC test site as described and analyzed in the NMD Deployment EIS.

The GMD VOC test site would also require use of a MAB, utilities building, Readiness and Control Station, fuel unloading area, and additional existing buildings (514, 601, 626, 628, 629, 658, 663, 675, and 701).

## 2.3.2 BMC3

### 2.3.2.1 BMC2 Node

A BMC2 Element Site Communication Node would be located in the manned Readiness and Control Facility.

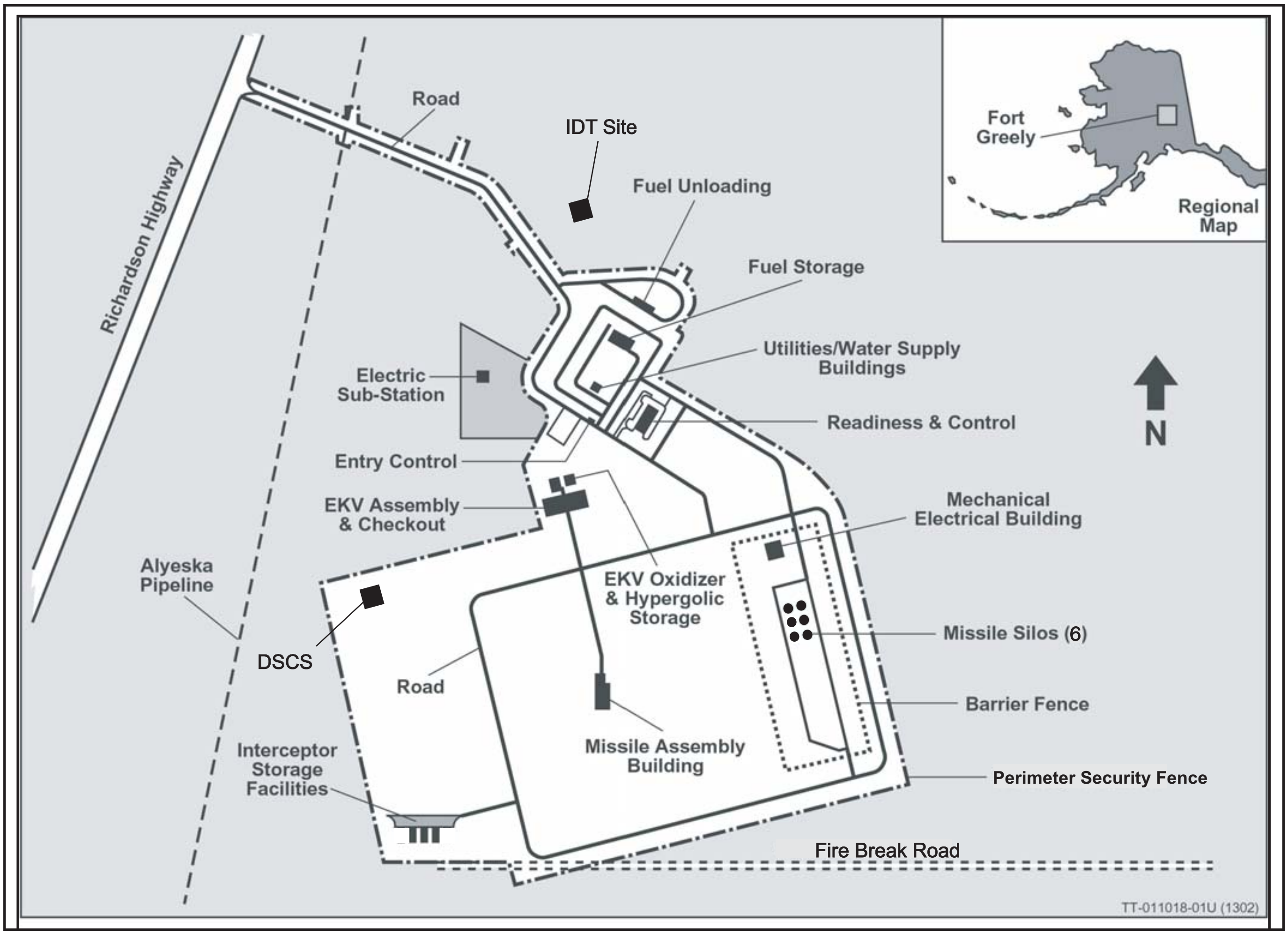
### 2.3.2.2 IDT

**Construction**

One IDT would be constructed at Fort Greely to support the GMD test activities. IDT Site 9 is the preferred site and is 1,000 meters (3,281 feet) northwest of the missile field (figure 2-10). Eight alternate IDT sites were identified during the siting process. Figure 2-10 shows these sites.

**Operation**

Locally available commercial electrical power would be the primary source of power for the IDT on Fort Greely. To support current requirements and anticipated near-term growth, a total of 225 kilovolt-amperes of 480/277 volt, 3-phase wye-connected power is required. The IDT site would not be manned.




EXPLANATION

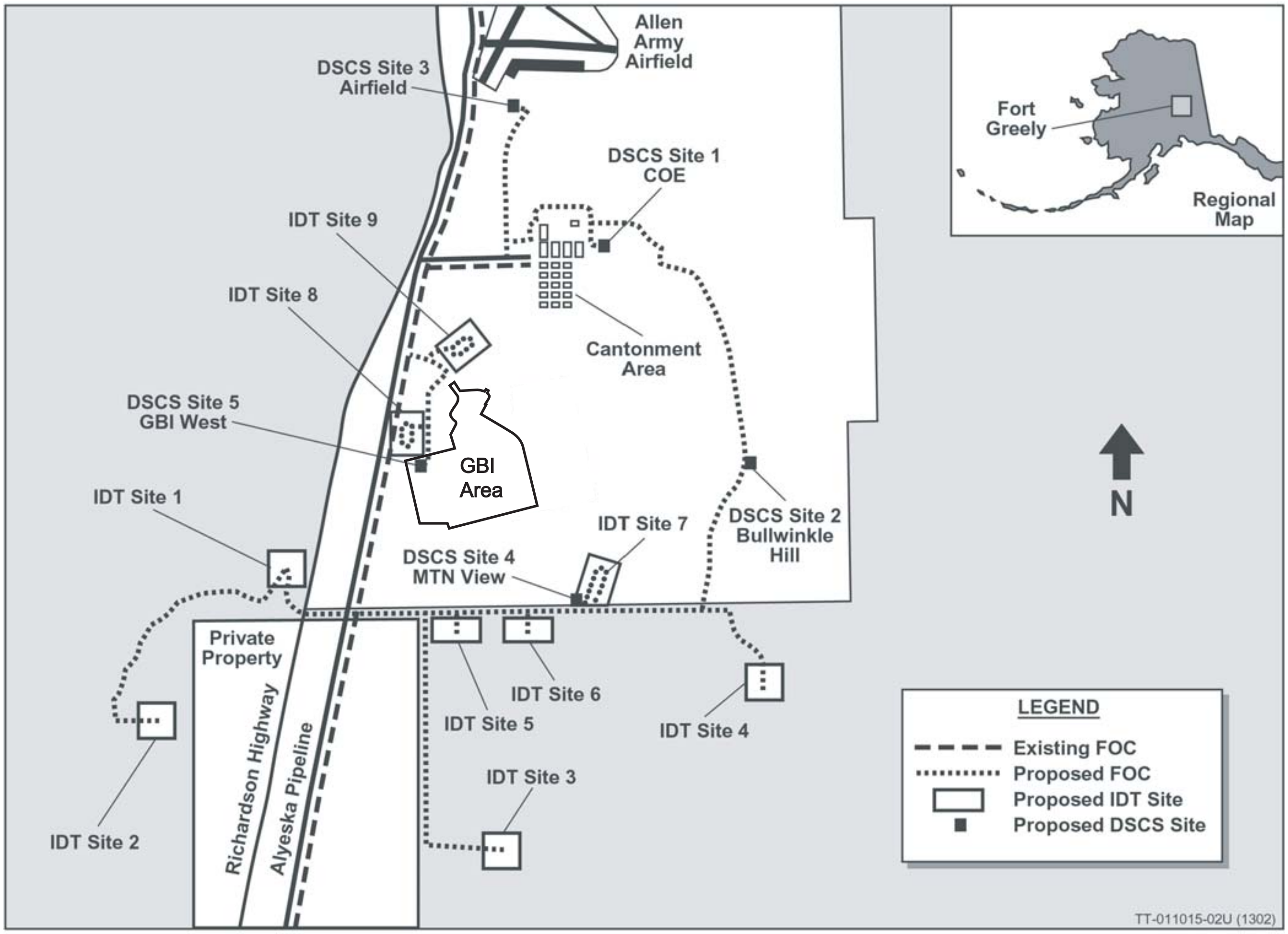
## Conceptual Layout of GBI VOC Test Facilities

Fort Greely, Alaska

NORTH

Not to Scale

**Figure 2-9**




EXPLANATION

## Conceptual Test Site Layout

Fort Greely, Alaska

NORTH

Not to Scale

**Figure 2-10**

**Table 2-3: GMD Facility Requirements, Fort Greely, Alaska as Described in the NMD Deployment EIS**

| New Facilities | Existing Facilities Proposed for Use (Building Number) |
|---|---|
| Launch Silos | 100—Hangar |
| Interceptor Receiving and Processing Facility | 508, T-509, 601, 608, 612, 670—Warehouse/Storage and adjacent areas |
| Interceptor Storage Facilities | 659-663, 702, 705-714, 804-806, 808-810, 812-814, 816-818, 825-827, 829-831, 833-835, 850-852, 854-856, 862-864, 875-877, 887-889, 895, 896, 910-946, 950-955—Housing |
| Headquarters Facility | 504—Fire Station |
| Silo Interface Vault | 605, 615, 626—Motor Pool |
| Mechanical/Electrical Equipment Building | 503, 630, 654, 655, 658, 853—Administration |
| Administration and Maintenance Facility | Runway—remove and reconstruct |
| Backup Power Generation with Fuel Storage | 101, 103, 106, 160, 162, 318-320, 338-341, 346, 347-354, 361, 609, 610, 628, 629, 635, 650-653, 656, 675, 701, 725, 801, 802, 820-822, 824, 845, 847 |
| Security (Fencing, Lighting, Monitoring Equipment) | |
| Sewage Treatment (Septic Field) | |
| Steam Plant | |
| Substation | |
| Readiness Station | |
| Security Building | |
| Entry Control Station | |
| Roads/Utility Extensions/Water Wells | |
| Fuel Unloading Facility | |
| Water Supply Facility | |

### 2.3.2.3 GMD Communication Network

The GCN subcomponent would include one remotely controlled DSCS and the FOC required to link the components of the GMD test activities.

#### DSCS

**Construction**

One DSCS earth terminal composed of a single antenna installation would be constructed at the preferred DSCS Site 5, GBI west approximately 1,000 meters (3,281 feet) west of the missile field (figure 2-9). A road would be required to provide vehicle access to the facility. Four alternate DSCS sites were identified on Fort Greely during the siting process. Figure 2-10 shows DSCS Sites 1 through 4.

**Operation**

The DSCS would provide satellite communications among Eareckson AS, Fort Greely, and the BMC2 Command Nodes during GMD test activities.

**Fiber Optic Cable**

**Construction**

Figure 2-10 shows the proposed FOC routes at Fort Greely. Existing FOC would be used whenever feasible.

**Operation**

The FOC network would provide the communications link between the components and subcomponents of the GMD test sites.

### 2.3.3 ELECTRICITY DISTRIBUTION UPGRADES

To supply the 5 MW of electricity required for proposed GMD VOC test activities at Fort Greely, electric distribution system upgrades would be needed. The Golden Valley Electric Association would construct a new 138 kilovolt (kV) power transmission line from the Jarvis Creek substation to the Fort Greely GMD VOC test site. Figure 2-11 shows the proposed transmission routes. This expanded electric service would also support future needs, if Fort Greely were selected as an operational site. The power line would be installed on 24-meter (80-foot) metal or wood poles that would support three transmission lines. A clearing approximately 15 meters (50 feet) wide along the proposed route would be created in the trees (mainly birch and cedar about 6 to 9 meters [20 to 30 feet] tall) to allow for installation and operation of the line. For each alternative route, an effort would be made to maintain a 15-meter (50-foot) buffer zone between the highway and the area that would be cleared for the transmission line route.

**Alternative Routes**

Five alternative routes were considered for the new transmission line from Jarvis Creek, but only three were carried forward for analysis (figure 2-11). The primary corridor for existing rights-of-way within the area is along Richardson Highway. The highway generally runs south to north with Fort Greely, the Jarvis Creek Substation, and the proposed GMD substation located east and adjacent to the highway. Major considerations for route selections east of the highway are Allen Army Airfield runways, Fort Greely Training areas, the existing power line, and the oil pipeline. Major considerations west of the highway are the following: a portion of the existing power line, limited space along portions adjacent to the highway, the airfield, and a significant decrease in elevation adjacent to the highway.

**Route 1**—This preferred route would essentially parallel the existing 25-kV route on the east side of the Richardson Highway. As with the current 25-kV route, it would cross the Richardson Highway near the western end of the East-West runway at Allen Army Airfield, descend to the River Valley, then immediately re-cross the highway upon leaving the area where there are airfield restrictions and continue south on the eastern side. Additional clearing would be required to allow the 25-kV line and 138-kV line to be installed along the same route. The existing 25-kV 9-meter (30-foot) right-of-way would need to be expanded to 15 meters (50 feet).

**EXPLANATION**

- Boundary
- Roads
- Proposed Power Line Route #1
- Proposed Power Line Route #2
- Proposed Power Line Route #3
- Airfield
- Substation

NORTH

Scale

0 698.5 1,397 meters

0 2,291.5 4,583 feet

02-11-02 Power Lines 2-11

## Conceptual Golden Valley Electric Association Power Line Routes

Fort Greely, Alaska

**Figure 2-11**

**Route 2**—Alternative route 2 would exit the substation and cross Jarvis Creek, essentially parallel with the oil pipeline and existing power line. Upon crossing the creek, it would immediately cross to the west side of the Richardson Highway, then travel south/southeast approximately 8 kilometers (5 miles). It would then re-cross to the east side of the highway at a point opposite the proposed GMD substation. The terrain west of Richardson Highway is initially the same as the highway, but after about 3 kilometers (2 miles) decreases in elevation approximately 15 to 24 meters (50 to 80 feet) to the Delta River Valley. The route would remain on the valley floor, following the contour line, until it reaches the point opposite the GMD substation. In the area opposite the Allen Army airfield, the west side of the highway is on the edge of the river valley. Due to the height and distance restrictions adjacent to the runways, all alternative routes would be required to extend into the valley in this area near the airfield. Two scenic overlooks are in the area where the line would be installed down the slope from the highway.

**Route 3**—This alternative would be identical to Route 1 until it ascends the slope out of the Delta River valley after it leaves the area near the airfield. At this point it would not cross the highway. It would continue to follow west of and adjacent to Richardson Highway until it was opposite the proposed GMD substation and would then cross the highway into Fort Greely.

**Alternative Routes Not Carried Forward**

**Route 4**—This alternate route was considered, but not carried forward for analysis. The route would travel east of the Jarvis Creek substation then turn south and follow 30-Mile Road, a dirt road through Fort Greely's training areas. After passing the airfield it would turn west to the GMD activity areas. This route would have to pass directly through Buffalo Drop Zone, which is an active drop zone used for U.S. Army airborne operations. Installation of the high voltage lines in these areas would preclude further use of Buffalo Drop Zone for airborne landings.

**Route 5**—This alternative considered upgrading the existing 25-kV line to 138-kV, but was not carried forward for analysis. This alternative would require new poles since the higher voltage would require additional ground clearance. The existing line would also have to be shut down for an extended period of time during the upgrades, interrupting service to customers, or worked on as a hot line requiring additional safety measures. This alternative was not practicable considering Alaska's weather conditions and the additional cost related to additional safety measures that would be required.

### 2.3.4 MANCAMPS AND SUPPORT FACILITIES

The NMD Deployment EIS evaluated use of existing facilities for personnel housing and administrative functions. Some of these existing facilities have been vacant since the base underwent realignment under the Base Realignment and Closure Act beginning in 1995. Because some of the facilities have been vacant since 1995, some level of renovation work would be required before their use. This EA incorporates the analysis of the NMD Deployment EIS as it applies to the use of existing facilities. The withdrawal from surplus of property declared surplus during the base realignment has allowed for existing facilities to be available for the GBI VOC test site activities. Nine additional support facilities could be provided to the Prime Contractor for warehouse space and equipment maintenance space. These buildings (buildings 514, 601, 626, 628, 629, 658, 663, 675, and 701) have been retained by the host installation for the GBI VOC test activities. Building 626 could be used jointly by the construction contractor for equipment maintenance. Minor painting and heating, electrical, and plumbing system repairs would be performed as necessary to allow reuse of these facilities.

A proposed alternative to the renovation and use of the existing facilities is the construction of temporary living and working facilities, or mancamps, to provide housing, administrative, and quality of life activity space in support of the GBI VOC test site activities.

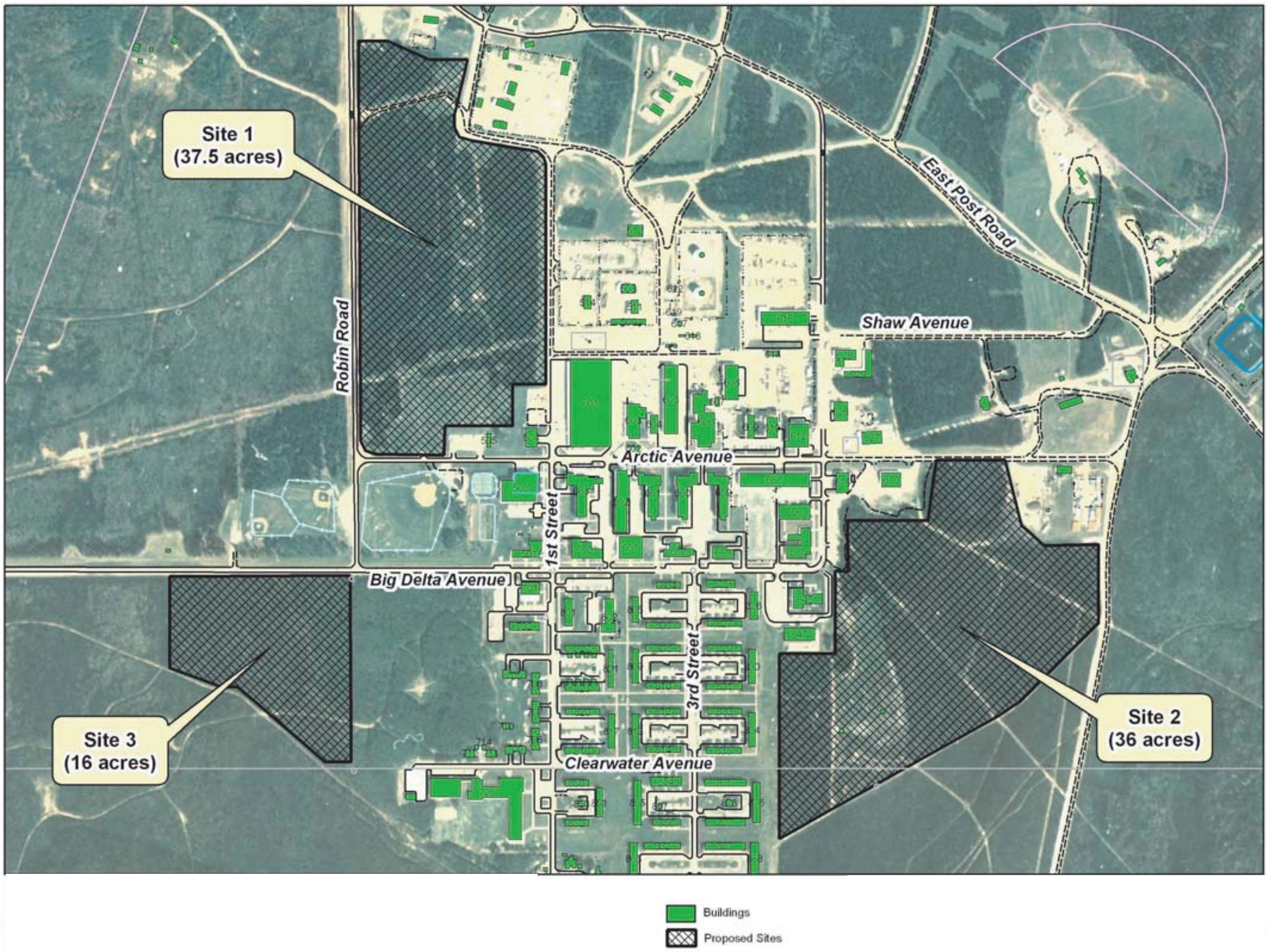
**Fort Greely Administrative Mancamp**

For the proposed mancamp alternative, it is currently anticipated that Government and Prime Contractor administration and operational personnel would be accommodated in an administrative mancamp near the GMD test site at Fort Greely.

A ground survey of Fort Greely was performed to determine optimum locations for siting the mancamp. Major siting considerations included proximity to existing utilities, road access, and environmental considerations such as biological and cultural resources and the presence of wetlands. Three sites near the Fort Greely Main Post were selected for consideration (figure 2-12). Currently, the preferred location for the mancamp would be at Site 2, on the east side of the cantonment area near Building 656. Site 2 is east of the existing housing area on 1st Street, south of Arctic Avenue, and west of 33 Mile Loop Road.

Potential Mancamp Site 1 is north of Big Delta Avenue, east of Robin Road, and west of 1st Street. Site 1 has road access on all four sides and provides access to Richardson Highway. There is no direct access to the proposed missile field.

Site 2 is near the shop and warehouse buildings proposed for use by the Prime Contractor and is also close to an underground utility corridor that supplies electricity, water, and sewer service. An electric power transmission line crosses the area, and there is road access to the site from all sides. In addition, the site could easily be separated into an accompanied housing area and an unaccompanied housing area, and the location provides access to the Richardson Highway without going through the Main Post area. The site provides nearly direct access to the missile field via an existing gravel road on the east side of the area. The north portion of the site is near the existing Military Satellite Communications terminals, and the east portion of the site is near the ammunition storage area.

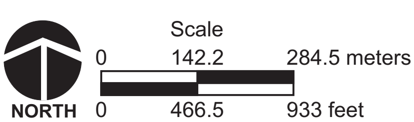



**EXPLANATION**

# Potential Sites for GMD Administrative Mancamp

Fort Greely, Alaska

**Figure 2-12**




02-09-02 Pot Sites GMD Test Mancamps 2-12

Site 3 is south of Big Delta Avenue and west of the existing housing on 1st Street. Site 3 has no access roads or nearby utilities, and would require further extension of utilities from the cantonment area. The close proximity of Site 3 to Richardson Highway would also increase security risks.

The Administrative Mancamp would provide office space for approximately 120 personnel, housing units and dining facilities for 200 personnel, a medical treatment area, and morale, welfare, and recreation activities such as fitness and television rooms. Two areas would be provided for office space for Government and Prime Contractor personnel, with each facility approximately 1,022 square meters (11,000 square feet) in size. The morale, welfare, and recreation facility would contain an area of approximately 948 square meters (10,200 square feet). The mancamp area would be fenced and gated with controlled access to restrict entry.

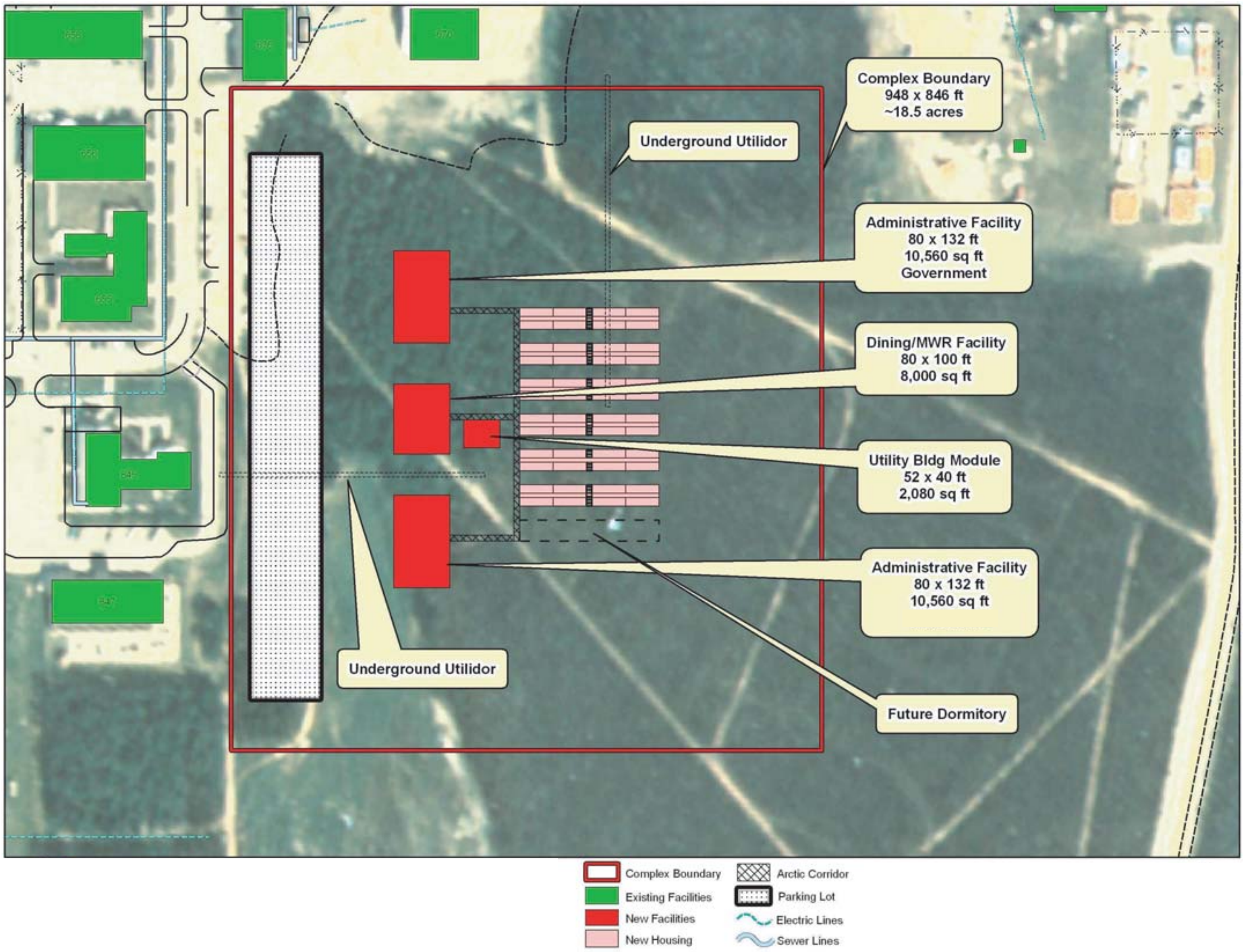
The mancamp site would be prepared by clearing, hauling of gravel fill, leveling, and compaction. Roads and parking areas would be created with gravel fill and drainage ditches. Lighting would be installed for security and parking. Headbolt heaters would be provided at parking locations to prevent vehicle engines from freezing. Electricity would be provided by Golden Valley Electric Association, with backup power provided by the onsite substation as needed. Facility units would be erected on pedestals or block foundations. Covered walkways would be constructed to provide protection from the winter conditions between buildings. Figure 2-13 shows a representative mancamp facility layout.

**Operations**

The current schedule shows a total of 40 personnel onsite at Fort Greely at the beginning of construction. Until the administrative mancamp could be established, these personnel would be housed in three unaccompanied personnel housing buildings on Fort Greely. These units (Buildings 804, 805, and 806) have been retained by MDA for use in the GMD test site. These facilities would only require minor painting, maintenance, and cleaning, as well as furnishings to be operational. It is currently anticipated that the administrative offices, and the dining, medical, and morale, welfare, and recreation facilities would arrive at Fort Greely simultaneously with the initial housing units. The remaining housing units would arrive approximately 9 months later. The administrative mancamp could be expanded as necessary should additional personnel arrive to work at the test site. Mancamp units would be temporary structures and would be removed when no longer needed.

**Offsite Construction Mancamps**

Each construction contractor would provide housing for its personnel, as it deems appropriate, most likely in the vicinity of Delta Junction, Alaska, and would provide its own administration and construction trailers at the Fort Greely GBI VOC test site during construction activities. Other potential housing in the vicinity of Delta Junction could




**EXPLANATION**

# Representative Mancamp Facility Layout

Fort Greely, Alaska

**Figure 2-13**

Scale
0 37.5 75 meters
0 123 246 feet
NORTH

include the use of existing available houses, motels, mobile home communities, or placing mobile homes on leased property. It is currently anticipated that an average of 400 construction contractor personnel would be housed in the offsite mancamps. The mancamps could be established on leased private or City land. Golden Valley Electric Association would provide electricity. Since the construction contractor would make its own decisions about how to house personnel off-post, this EA can only analyze generic impacts to infrastructure and socioeconomics from establishing a mancamp at an offsite location.

#### 2.3.4.1 Solid Waste Landfill Extension/Construction Debris Disposal/ Landfill Access Road

The existing, permitted Fort Greely Solid Waste Landfill consists of five cells. Four cells are closed and a portion of the fifth cell has been opened. There is room to establish a sixth cell within the existing fenced landfill area. The current permit was issued in May 1999 and was extended to 30 July 2002. A state landfill permit may be extended for a period of up to 5 years from the date of issuance.

In order to accommodate proper disposal of solid waste from construction and operations, the Proposed Action includes expanding the existing Fort Greely Solid Waste Landfill capacity and extending the existing permit. A request for permit extension would be submitted to the state regulatory agency, in accordance with the Alaska Administrative Code (AAC), Title 18, requesting the establishment of a sixth cell within the existing landfill area. A new access road to the landfill would be sited to the east of the GBI VOC test site. An alternative to extending the existing Fort Greely landfill would be to transport solid waste to the existing North Star Landfill in Fairbanks, Alaska under agreement with local government officials.

Alternatives to expanding the existing Fort Greely Solid Waste Landfill for disposal of construction debris generated as a result of GMD VOC test construction activities would include the following:

- Use the Fort Greely burn pit to dispose of burnable waste such as paper product and wood
- Place inert construction debris such as concrete rubble on top of the existing closed cells at the Fort Greely Solid Waste Landfill in accordance with state and local requirements
- Transport debris and solid waste to the North Star Landfill
- Construct a new construction debris landfill in the vicinity of the existing landfill at Fort Greely in accordance with state and local requirements

#### 2.3.4.2 Allen Army Airfield Repair

A potential action would involve use of Allen Army Airfield at Fort Greely such that equipment and personnel for GMD test activities could potentially be flown directly into Fort Greely thereby offering mitigation to the risk inherent in highway movement. The airfield is currently used for existing missions and emergency civilian use, but is in a deteriorated state of repair. The main runway is 2,286 meters (7,500 feet) long and 46 meters (150 feet) wide. A project for repair of the airfield is currently programmed by the U.S. Army to bring failing portions of the airfield back to standards and useable for its existing mission and use. After those repairs are completed, use of the airfield would be a reasonable alternative to the use of Eielson AFB for movement of equipment and personnel and the construction and operation of the Eielson AFB Missile Transfer Facility discussed in section 2.2.5.

The repairs to be accomplished by the U.S. Army include repair of a 335-meter (1,100-foot) section of the runway's subgrade, and surface pavement; re-paving the rest of runway (1,981 meters [6,500 feet] with a 10-centimeter (4-inch) overlay of new asphalt, which involves excavating down 124 centimeters [49 inches] from the top of runway and rebuilding the section with 102 centimeters [40 inches] of compacted sub-base, 15 centimeters [6 inches] of drainage layer and 10 centimeters [4 inches] of new asphalt; repair of the storm water collection system; replacement of pavement markings; replacement of two deteriorated aircraft sized fuel aprons, 61 meters by 76 meters (200 feet by 250 feet); adding a 378,541-liter (100,000-gallon) aboveground fuel tank, and; replacing runway lighting for the re-paved section.

## 2.4 ALTERNATIVE GBI SITE

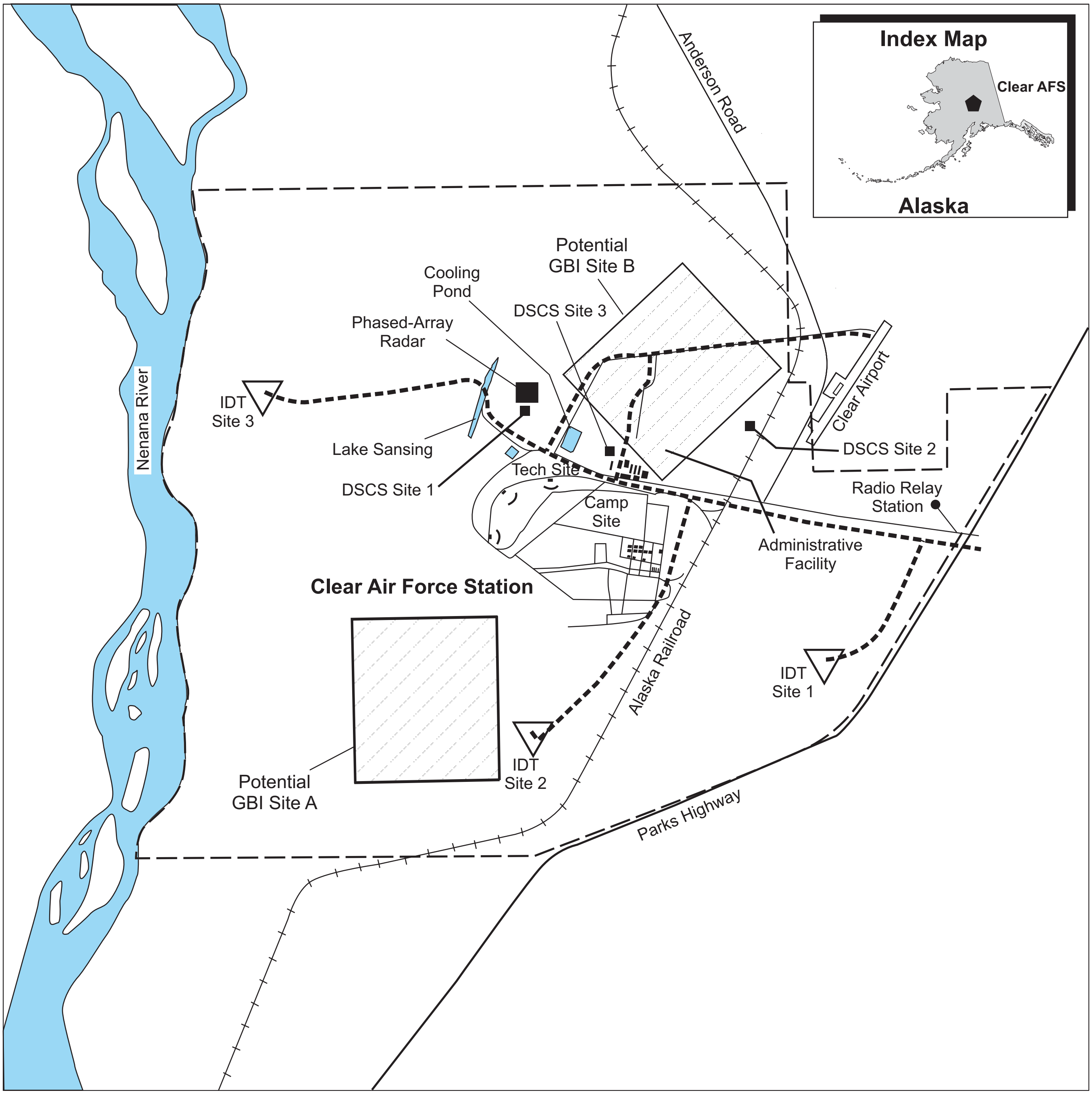
The Alternative Action would be the same as the Preferred Alternative, except the GBI VOC test site, components, and sub-components described at Fort Greely, Alaska would be constructed and operated at Clear AFS, Alaska in a similar manner.

The Alternative Action would construct and operate the GBI VOC test site at Clear AFS, Alaska, at either Site A or Site B (figure 2-14), and related support facilities at other locations as shown in table 2-4.

### 2.4.1 GROUND-BASED INTERCEPTOR

The GBI VOC test site at Clear AFS would be constructed, configured, and operated similar to the methods described for the Preferred Alternative in section 2.3.1 and shown in figure 2-9. Figure 2-14 provides a layout of GBI VOC test facilities at Clear AFS. GBI components would be transported from the manufacturer by air to Eielson AFB and then overland by truck or rail to Clear AFS, or overland by truck or rail to Clear AFS. Table 2-5 provides a list of facility requirements for the GBI VOC test site as described and analyzed in the NMD Deployment EIS. Additional existing facilities may be required for use.

Clear Airport is a General Aviation airport that mainly serves local residents with private planes. The runway is approximately 1,219 meters (4,000 feet) long and 30 meters (100 feet) wide. (State of Alaska, 2000) No upgrades to the Clear Airport runway are planned. It would be more cost effective to construct the Missile Transfer Facility on Eielson AFB as discussed for the Preferred Alternative and transport the missiles and components by truck to the installation if this alternative is selected.




**EXPLANATION**

Roads

Water Area

Installation Boundary

Railroads

Fiber Optic Cable (FOC) Route

NORTH

0 2,500 5,000 feet

0 762 1,524 meters

# Conceptual Layout of GBI VOC Test Facilities

Clear Air Force Station, Alaska

**Figure 2-14**

02-08-02 GDM Test Site Layout 2-14

**Table 2-4: GMD VOC Alternative, One GBI Site with Six Silos**

| GBI | BMC2 | IDT | DSCS Terminal | Radar Support | Transportation | UEWR |
|---|---|---|---|---|---|---|
| Clear AFS | Clear AFS | 1 at Clear AFS | 1 at Clear AFS | COBRA DANE Eareckson AS | Missile Transfer Facility at Eielson AFB | Beale AFB |
| | Peterson AFB, Shriever AFB, Cheyenne Mountain Complex, Boeing Facilities, Beale AFB, and Eareckson AS | 1 at Eareckson AS | 2 co-located at Eareckson AS | | | |

**Table 2-5: GMD Facility Requirements, Clear AFS, Alaska as Described in the NMD Deployment EIS**

| New Facilities | Existing Facilities Requiring Modifications (Building Number) |
|---|---|
| Launch Silos | 870—Open Storage |
| Interceptor Receiving and Processing Facility | 1, 3, 4, 26, 29, 35, 37, 40, 41, 42, 43, 48, 50, 51, 62, 65, 66, 79, 80, 82, 93, 720—Buildings and adjacent area known as Construction Camp |
| Interceptor Storage Facilities | |
| Headquarters Facility | 251—Fire Station |
| Silo Interface Vault | 100, 150, 196, 200-204, 209, 250, 280 |
| Mechanical/Electrical Equipment Building | |
| Administration and Maintenance Facility | |
| Backup Power Generation with Fuel Storage | |
| Security (Fencing, Lighting, Monitoring Equipment) | |
| Equipment/Vehicle Storage Facilities | |
| Helicopter Pad | |
| Sewage Treatment (Septic Field) | |
| Housing/Dormitory/Dining | |
| Steam Plant | |
| Substation | |
| Readiness Station | |
| Security Building | |
| Warehouse | |
| Entry Control Station | |
| Roads/Utility Extensions/Water Wells | |
| Community Center | |
| Fuel Unloading Facility | |
| Water Supply Facility | |

### 2.4.2 BMC3

The IDT and DSCS earth terminal at Clear AFS would be constructed, configured, and operated in the same manner as described for Fort Greely section 2.3.2 and shown in figures 2-2 through 2-4. Figure 2-14 shows the potential locations of BMC3 facilities at Clear AFS.

#### 2.4.2.1 BMC2

A BMC2 Element Site Communication Node would be located at the GBI VOC test site on Clear AFS.

#### 2.4.2.2 IDT

One IDT site would be constructed and operated at Clear AFS to support the GBI VOC test site activities. Site 3 is the preferred site (shown on figure 2-14). Two alternate IDT sites were identified during the siting process. Primary power for the IDT at Clear AFS would be supplied by the existing Clear AFS power plant.

#### 2.4.2.3 GMD Communication Network

The GCN sub-component would include one remotely controlled DSCS and the FOC required to link the components of the GMD test activities.

**DSCS**

**Construction**

One DSCS earth terminal would be constructed and operated at Clear AFS to support the GBI VOC test site activities. The preferred location, Site 1, is within the south side of the fence line (see figure 2-14). Two alternate DSCS sites were identified during the siting process. Water and sewer service would be provided to the DSCS earth terminal.

**Operation**

The DSCS terminal would be an unmanned facility that would require no permanent onsite support personnel. Personnel would only be required during tests or during maintenance periods. The DSCS would provide satellite communications among Eareckson AS, Clear AFS, and the BMC2 Command Nodes during GMD testing.

**Fiber Optic Cable**

**Construction**

The proposed FOC routes to support the GMD test activities at Clear AFS are shown in figure 2-14. However, FOC would only be constructed where the DSCS and IDT are sited and existing FOC would be used whenever possible.

**Operation**

The FOC network would provide the communications link between the components and sub-components of the GMD test sites.

### 2.4.3 MANCAMP, HOUSING, AND ADMINISTRATIVE SUPPORT FACILITIES

Currently, the requirements for a mancamp, housing, and administrative support facilities for GBI VOC test site activities at Clear AFS have not been validated. If required, a mancamp for construction contractors would be temporary and established approximately in the center of the installation as indicated in figure 2-14. It would be designed similar to the Fort Greely mancamp described in section 2.3.4 and shown in figure 2-14 and would house the same number of personnel.

Housing and administrative support facilities (office and storage space) would also potentially be constructed or brought in (e.g. trailers or portable buildings) and located as indicated in figure 2-14. Existing facilities could potentially be modified and satisfy some or all of the administrative support facilities requirements.

The mancamp, housing, and administrative support facilities would be established in previously disturbed areas. Utilities would be provided from on-base resources. The mancamp area would be fenced and gated with controlled access to restrict entry.

## 2.5 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD FOR FURTHER ANALYSIS

**Alternative to GBI VOC Test Site**

The NMD Deployment EIS analyzed Fort Greely, Clear AFS, and the Yukon Training Area as reasonable alternatives for a deployed GBI that would maximize NMD performance. According to the NMD Deployment EIS, the Yukon Training Area is incompatible with the NMD, now GMD, action due to mission conflicts. Consequently, only Fort Greely and Clear AFS remain reasonable alternatives for a deployed GMD that could effectively defend all 50 states from a limited ballistic missile attack.

**Alternative Missile Transfer Facility Site**

There are two viable military airfields in the vicinity of the proposed GBI VOC sites: Eielson AFB and Fort Greely. Due to security and safety concerns caused by the potential requirement for temporary storage at/near the point of disembarkation of the missiles from the plane, the commercial airport adjacent to Clear AFS and the commercial airport at Fairbanks were not considered for analysis. In addition, the runway at the commercial airport adjacent to Clear AFS is too short to support aircraft required to transport the GBIs; modifying this runway would require significantly more work than would modifying the runway at Fort Greely, and was not considered to be a reasonable alternative.

### Alternative UEWR Sites

Beale AFB is one of only three operating EWRs sites in the United States; the other two are Cape Cod AFS in Massachusetts and Clear AFS in Alaska. The Beale EWR was sited at its current location to maximize the ability to perform critical defense missions, including acquisition and tracking of ballistic missiles aimed at the United States. The location of the Beale EWR on the west coast makes it the only EWR that can track GMD test activities launched from the presently existing test facilities in the Pacific. The Beale EWR and COBRA DANE Radar site are not reasonable alternatives to each other, as each radar performs a different function in validating the GMD operational concept. Constructing a new radar at some different location that could perform this function in the test bed would create more impact to the environment than would using the existing facility, and would be extremely expensive. For these reasons, no reasonable alternatives to use of the Beale EWR were identified.

### Alternative to COBRA DANE Radar Site

The location of the COBRA DANE radar provides the potential to test the BMC3 portion of the GMD element using real-time, real-world targets of opportunity, such as foreign test launches that are within the radar's field of view. This would test the ability of the BMC3 to integrate and effectively use real-world data processed by the upgraded COBRA DANE as part of the GMD VOC test bed. There are no other comparable radars in the northwest Pacific region that can perform this function. The Beale EWR and COBRA DANE Radar site are not reasonable alternatives to each other, as each radar performs a different function in validating the GMD operational concept. Constructing a new radar at a different location that could perform this function in the test bed would create more impact to the environment than would using the existing facility, and would be extremely expensive. For these reasons, no reasonable alternatives to use of the COBRA DANE Site were identified.

## 2.6 NO-ACTION ALTERNATIVE

Under the No-action Alternative, the GMD VOC test site would not be established, the GMD and its components could not be tested under operationally realistic conditions, and prove-out of interoperability functions could not be accomplished.

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