Environmental Conditions

Overview

This section presents a summary of known environmental conditions at BNAS that should be considered during reuse planning. Further details regarding existing environmental conditions and a data gap analysis are discussed in the comprehensive environmental review document presented in **Appendix G**.

This environmental analysis was prepared using limited data generated by other parties. The findings and conclusions are based on the consultants' professional opinions and on documents provided and produced by others. A complete list of references used during this analysis is presented in the comprehensive environmental review document in **Appendix G**. The potential exists for unreported and unknown environmental issues associated with the site or surrounding area that are not included in this document.

Background

Brunswick Naval Air Station has been the subject of environmental investigations, studies, and cleanup actions since the early 1980s. Aviation activities at BNAS during more than 70 years of operation generated petroleum hydrocarbons, waste oils, paint residues, hydraulic fluid, used batteries, and other wastes. Disposal of some wastes occurred on site. Later, recognition that these wastes might be harmful to human health and the environment resulted in laws and regulations governing their disposal and cleanup (e.g., the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] and the Resource Conservation and Recovery Act [RCRA]). The Installation Restoration Program (IRP) was developed by the Department of Defense (DoD) to comply with federal guidelines for managing and controlling past hazardous waste disposal actions. The IRP focuses on cleaning up contamination from past hazardous waste operations and past hazardous material spills (i.e., hazardous substances). However, it is not an all-encompassing program. The IRP is intended to address the cleanup of contamination and damage resulting from past, not current, activities.

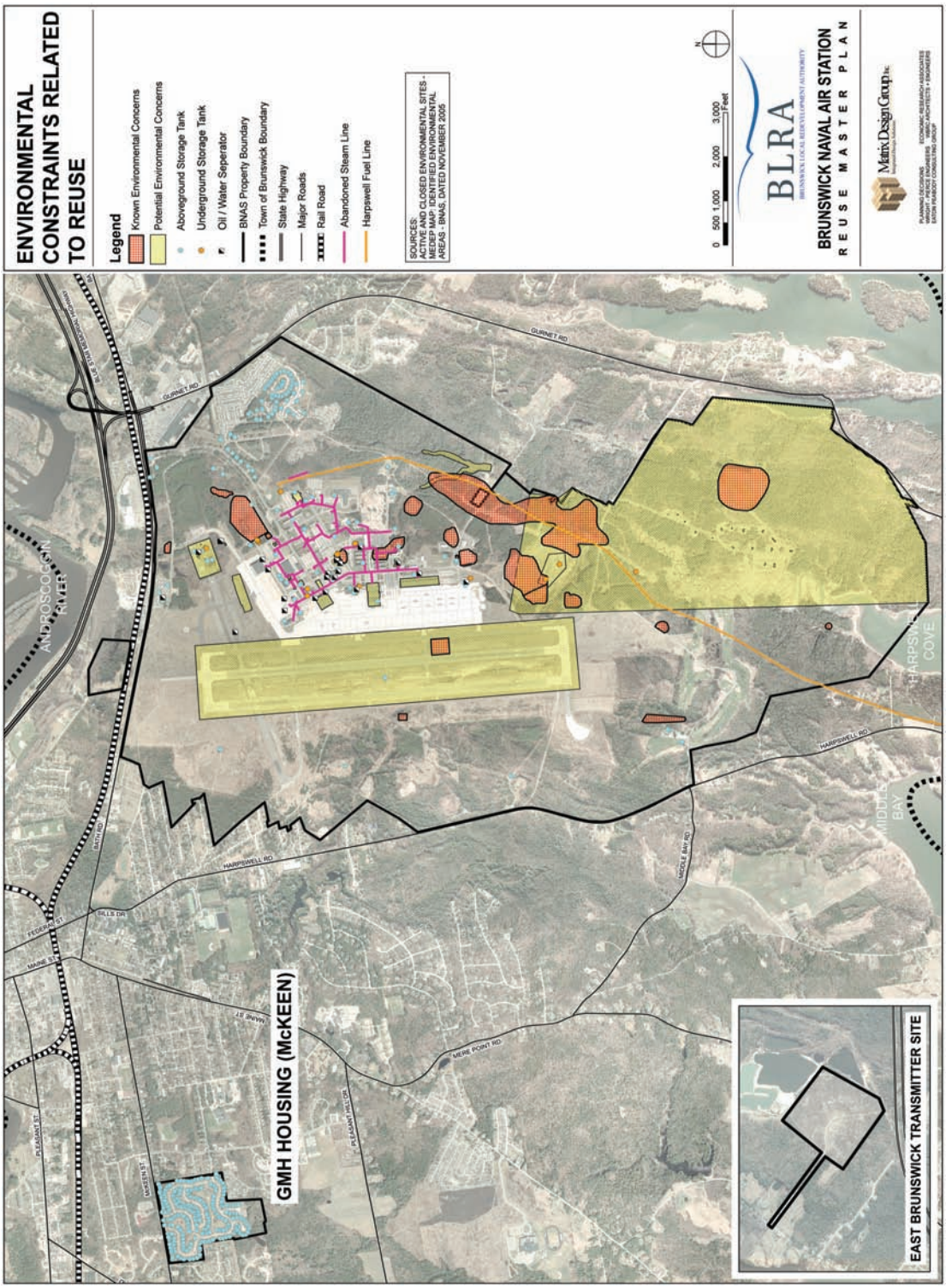
In 1987, BNAS was placed on the Environmental Protection Agency's (EPA's) National Priority List; therefore, the EPA is primarily responsible for overseeing the investigation and cleanup of BNAS, with assistance from Maine Department of Environmental Protection (MEDEP). In 1990, the Navy entered into a Federal Facilities Agreement (FFA) with the EPA and MEDEP. The FFA was the first step to ensuring the environmental impacts were thoroughly investigated and appropriate remediation actions taken. Additionally, the FFA established a procedural framework for developing and implementing Remedial Investigations, Feasibility Studies, Remedial Actions, and Operations and Maintenance at the site in accordance to Superfund policy and federal

and state hazardous waste laws and regulations. A copy of the complete FFA is attached in **Appendix G**. Underground storage tank (UST) and aboveground storage tank (AST) sites contaminated only with petroleum products are managed by MEDEP.

Known Areas of Environmental Concern

Historically, industrial operations were present at BNAS to support a variety of Air Force and Navy operations. Currently, there are known environmental sites in active and inactive phases of investigation and remediation at BNAS. These sites are being investigated and/or remediated by the Navy under the IRP and the Military Munitions Response Program (MMRP). A summary table of known information about each site and a cross reference table listing each of the known environmental sites by proposed land use are included in **Appendix G**. A map showing potential environmental constraints is provided as **Exhibit 39: Environmental Constraints Related to Reuse**.

Exhibit 39: Environmental Constraints Related to Reuse



Source: Matrix Design Group

Active and Conditionally Closed IRP Sites

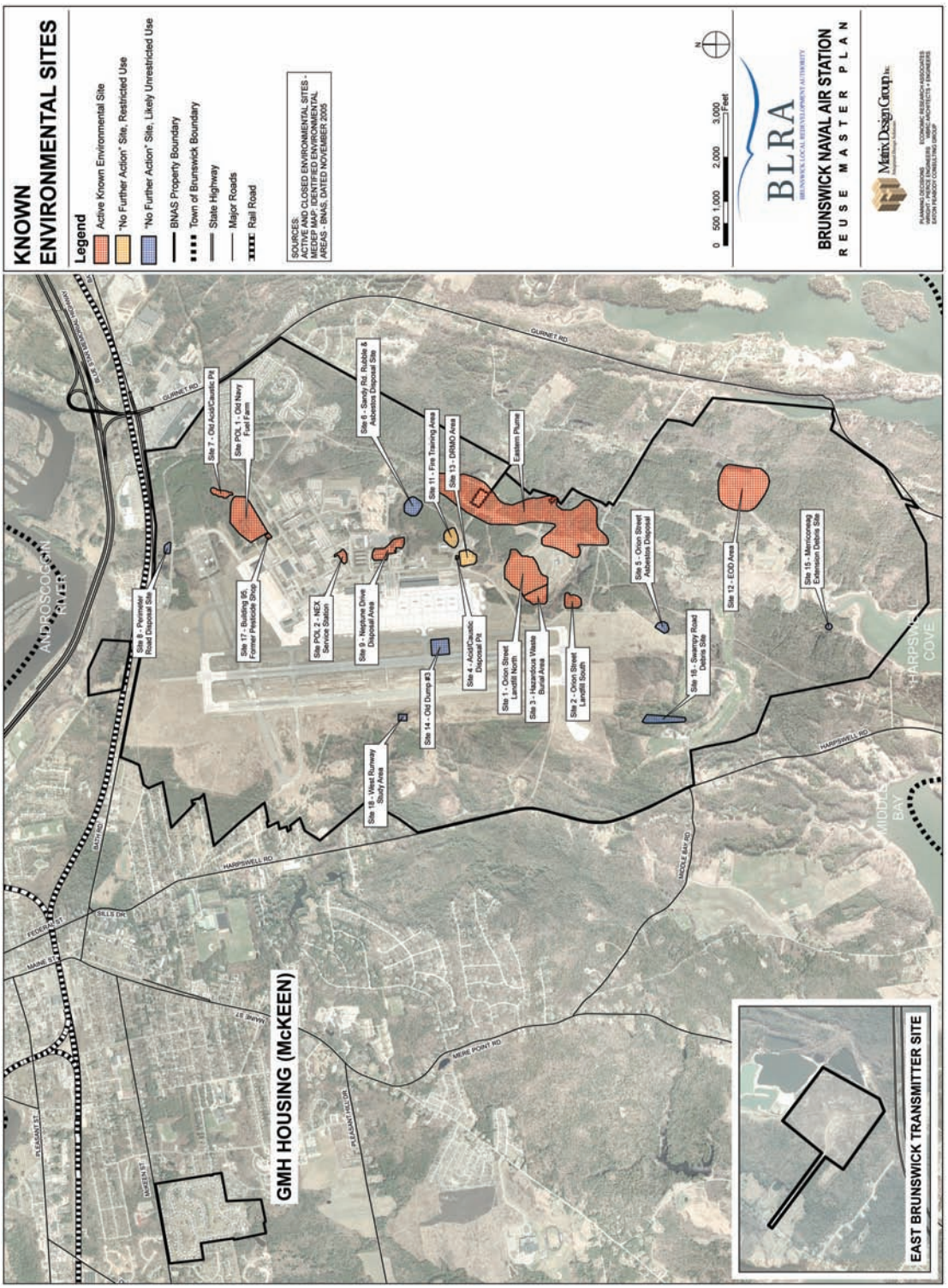
Since 1983, the Navy has identified 20 Installation Restoration Program (IRP) sites and an extensive groundwater contaminant plume at BNAS as summarized the comprehensive environmental review document presented in **Appendix G**. These sites are shown on **Exhibit 40: Known Environmental Sites**. Several source areas have been since addressed by remediation activities including excavation and source removal, and installation of a groundwater treatment system. There are presently 13 active IRP sites including:

- Site 1 – Orion Street Landfill North
- Site 2 – Orion Street Landfill South
- Site 3 - Hazardous Waste Burial Area
- Site 4 – Acid/Caustic Disposal Pit
- Site 7 – Old Acid/Caustic Pit
- Site 9 – Neptune Drive Disposal Area
- Site 10 – Harpswell Cove Fuel Depot (transferred to DESC)
- Site 11 – Fire Training Area
- Site 12 – Explosive Ordnance Disposal (EOD) Training Area
- Site 13 – Defense Reutilization and Marketing Office (DRMO) Area
- Site 17 – Former Pesticide Shop
- Site 19 – Petroleum, Oil, and Lubricants 1 (POL1) Old Navy Fuel Farm
- Site 20 – POL2 Navy Exchange Service Station
- The Eastern Groundwater Plume

The seven inactive sites include:

- Site 5 – Orion Street Asbestos Disposal Area
- Site 6 – Sandy Road Rubble and Asbestos Disposal Site
- Site 8 – Perimeter Road Disposal Site
- Site 14 – Old Dump #3
- Site 15 – Merriconeag Extension Debris Site
- Site 16 – Swampy Road Debris Site
- Site 18 – West Runway Study Area

Exhibit 40: Known Environmental Sites



Source: Matrix Design Group

Specific concerns for each active and inactive site are addressed in the comprehensive environmental review document presented in **Appendix G**, and include: potential need for further sampling / analysis for additional contaminants, some remedies not protective for the long term if land use changes, requirements for institutional controls, and groundwater plume migration off-site and into surface waters.

EPA Records of Decision (RODs) for No Further Action (NFA) are in place for soil at Sites 4, 5, 6, 8, 11, and 13. The NFAs for Sites 4, 11, and 13 were granted because no direct contact or incidental ingestion pathways currently exist. If redevelopment occurs on these sites, additional investigation and remediation may be required. A Draft Consensus Statement providing NFA for Sites 14, 15, 16, and 18 was submitted to the EPA and the EPA responded to the Navy with comments in February 2001. A signed Final Consensus Statement has not been located.

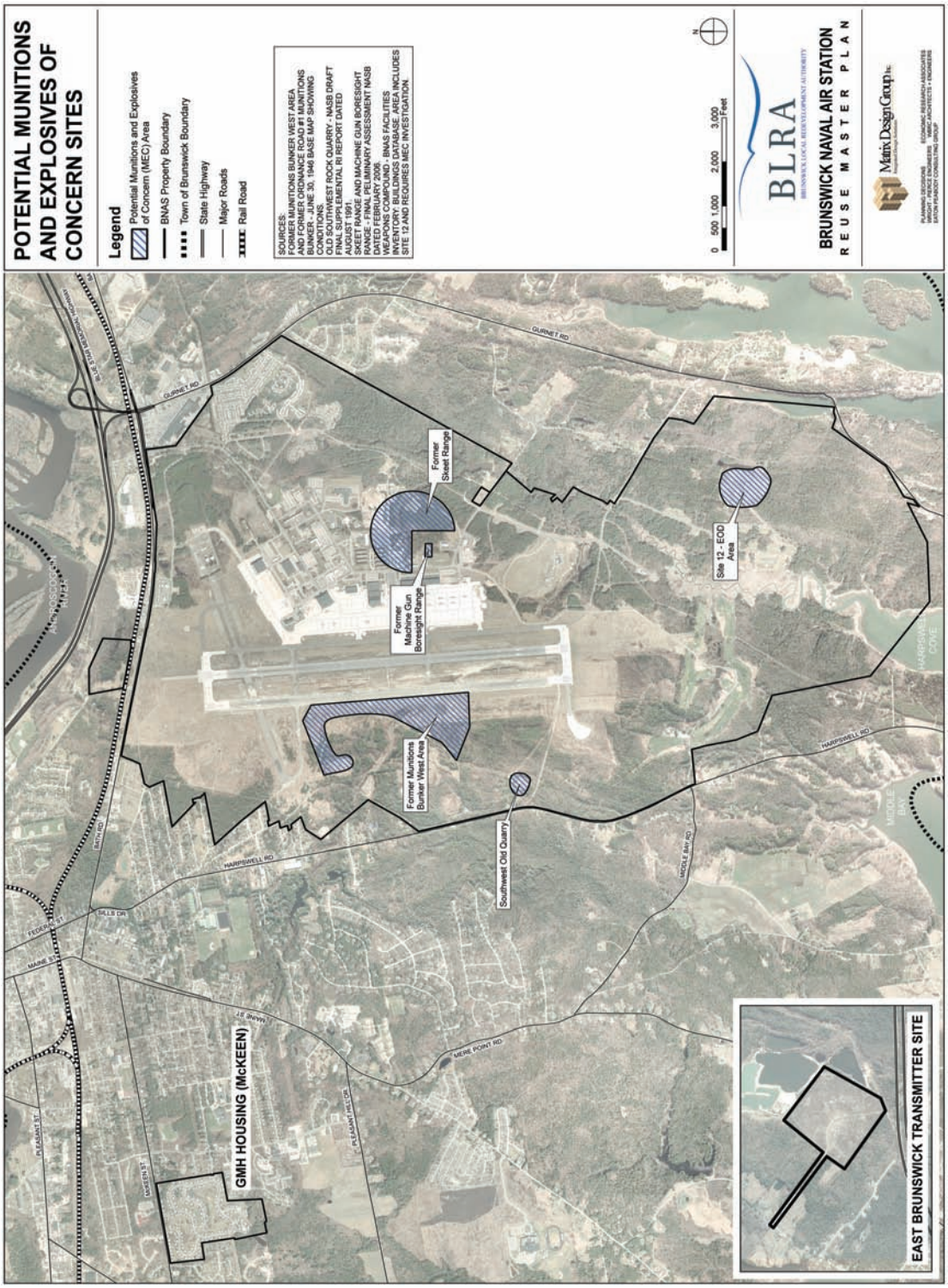
Military Munitions Response Sites

Five sites potentially containing Munitions and Explosives of Concern (MEC) have been identified for investigation under the MMRP as shown in **Exhibit 41: Potential Munitions and Explosives of Concern Sites Map**.

- UXO-1 – Former Munitions Bunker West Area
- UXO-2 – Machine Gun Boresight Range
- UXO-3 – Skeet Range
- Old Southwest Quarry Site
- Site 12 – EOD Area (This site is currently also under investigation in the IRP listed above)

A Preliminary Assessment (PA) has been conducted for the following identified MMRP sites: UXO-1, UXO-2, and UXO-3. An addendum to the PA is planned for the Old Quarry Site and Site 12 - EOD Area. The Navy is in the process of evaluating information obtained in the PA, and will be assessing which of the identified MMRP sites requires additional investigation. A summary of each of these sites is presented in **Appendix G**.

Exhibit 41: Potential Munitions and Explosives of Concern Sites Map



Source: Matrix Design Group

Potential Areas of Environmental Concern

The Navy has completed an extensive amount of investigation and remediation at BNAS. However, based on review of environmental information, historical uses of buildings, processes conducted at BNAS, and knowledge of other bases closed under BRAC, there are numerous data gaps related to environmental conditions at BNAS. Data gaps exist for the identified sites (i.e. IRP, MMRP, and Petroleum Sites), as well as for unknown or potential areas of concern. These data gaps are detailed in **Appendix G**, where the gaps are summarized by site wide concerns, and by land use areas presented in this Reuse Plan. A summary of the potential areas of environmental concern and data gaps is presented below.

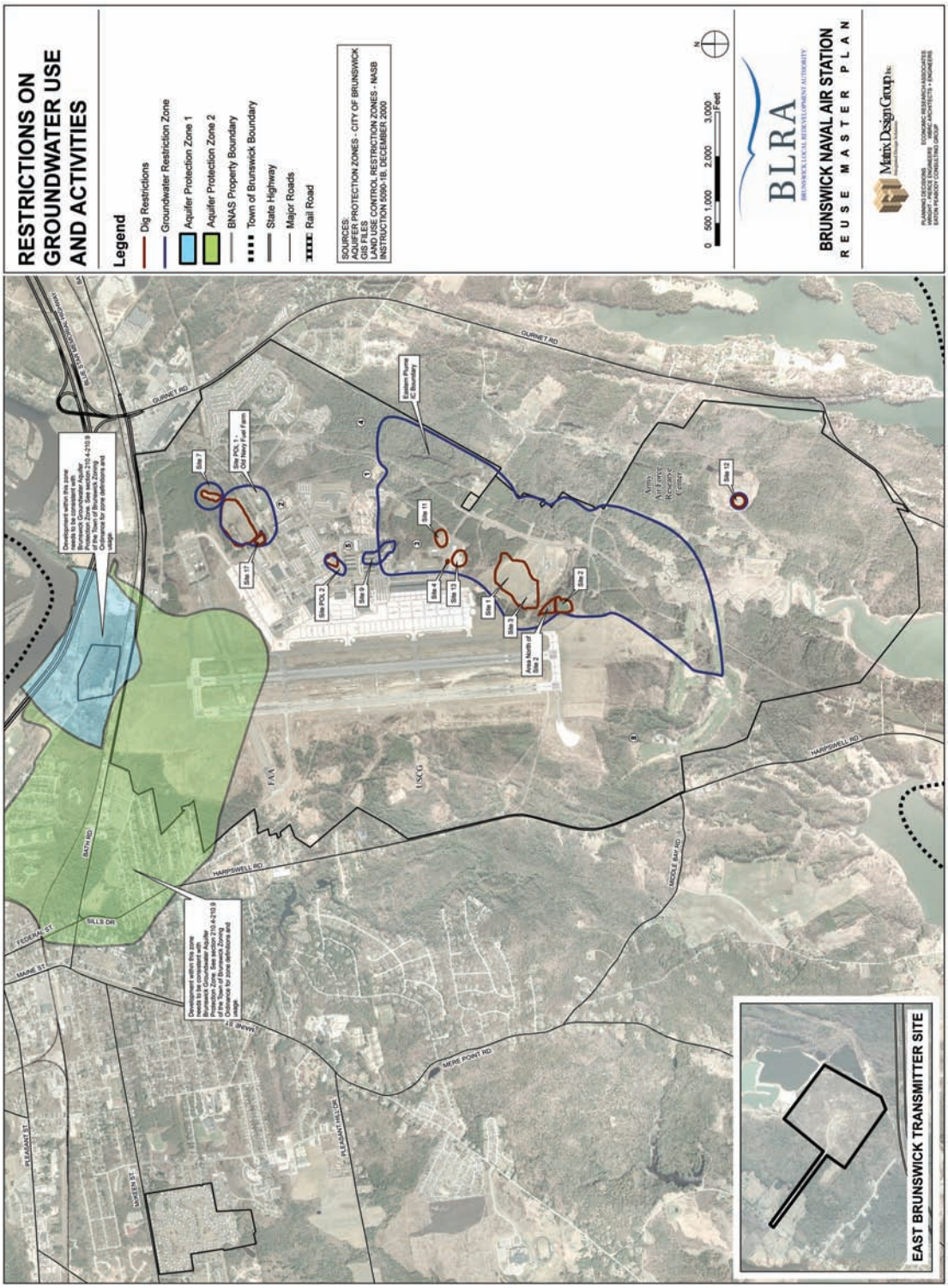
Existing Land Use Controls

The *Draft NAS Brunswick Instruction 5090.1C, Restriction on Excavation Activities and Groundwater Use* document outlines procedures to ensure proper review and coordination of proposed soil excavation and groundwater use. The document provides information on the location of hazardous waste and petroleum sites and enacts land use restrictions in the form of administrative controls on excavation and/or groundwater use activities at sites, as shown in **Exhibit 42: Restrictions on Groundwater Use and Activities** Map. Proposed land use changes during redevelopment may require changes to the LUCs in the event the contamination is not remediated. Where specific land use controls are not considered appropriate for the planned reuse, they are noted in **Appendix G**.

Base-wide Groundwater Model

One of the most significant data gaps is the lack of a base-wide groundwater model that evaluates existing IRP sites, their impact on the Eastern Plume, the nature and extent of groundwater contamination, and hydrologic interactions of surface water, alluvial groundwater, and bedrock groundwater. The EPA has imposed base-wide restrictions on groundwater use, and a model will help define areas appropriate for Land Use Controls.

Exhibit 42: Restrictions on Groundwater Use and Activities Map



Source: Matrix Design Group

Petroleum Hydrocarbon Sites

Twenty-four oil / water separators (OWS) either currently or historically existed at BNAS. Three discharge into the storm sewer system and the remainder discharge into the sanitary sewer system. Documentation regarding integrity testing of the oil / water separator containment systems has not yet been located. Currently, there are 138 active ASTs and 11 inactive ASTs that contain gasoline, diesel, #1 and #2 fuel oil, JP-8, hydraulic oil, waste oil, cooking grease, waste glycol, ethylene glycol, or lube oil. All ASTs are inspected annually in compliance with the BNAS' Spill Prevention, Control, and Countermeasures Plan. From interviews with base personnel and MEDEP, historical releases from ASTs are known to have occurred. There are also 17 active USTs, but the UST database indicates at one time there were 525 USTs on-site. Tanks have been removed and either replaced with an AST, or removed with no replacement due to building demo or conversion to natural gas. Specific locations of former tanks are not available in the database, only associated building numbers and street addresses. Limited to no investigation work was performed or documented during tank removals and/or replacements. Tables in the comprehensive environmental review document presented in **Appendix G** include lists of active ASTs, USTs, and OWSs.

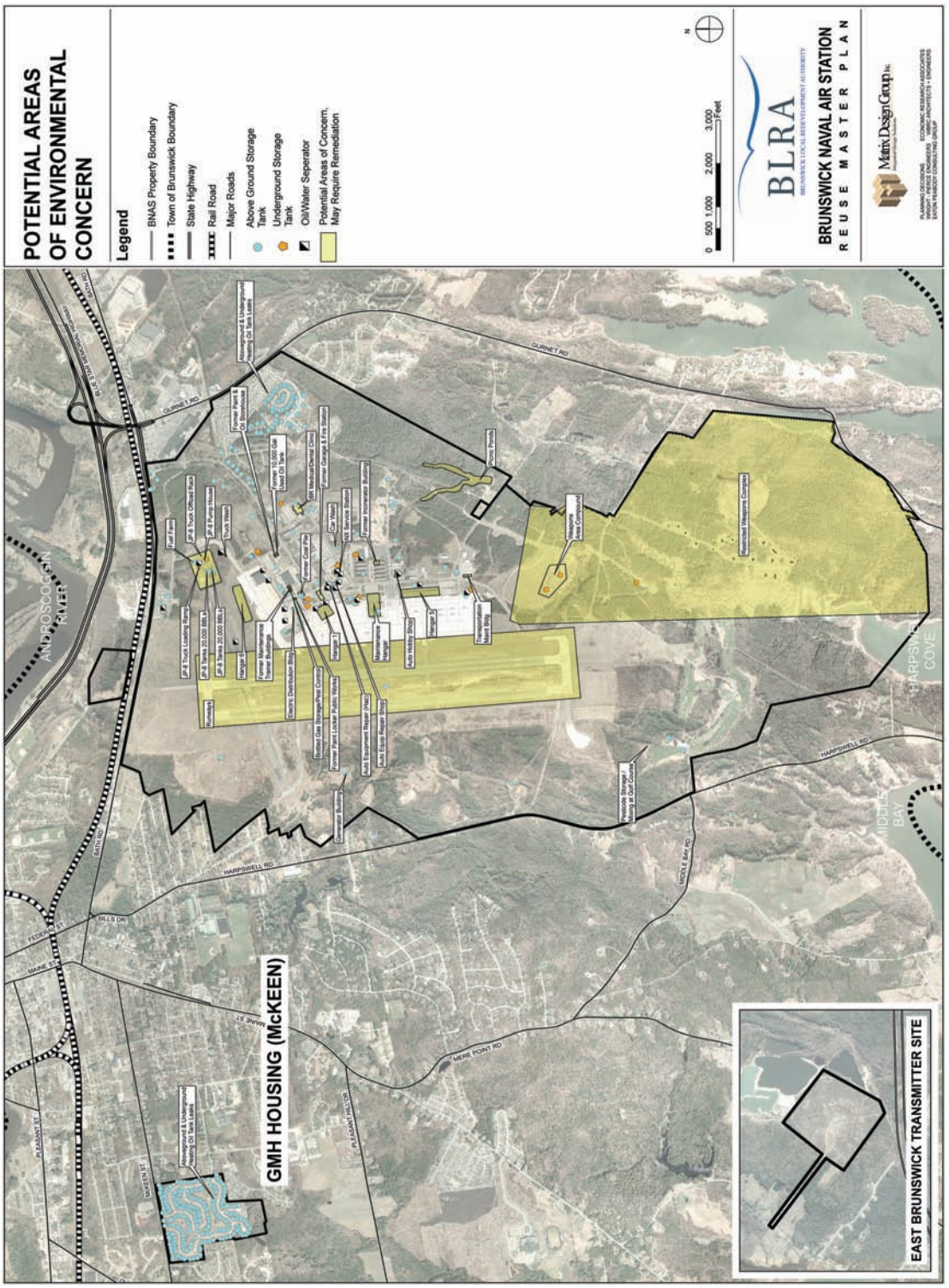
Potential Radiological Contamination

The historical presence of nuclear weapons at BNAS "can neither be confirmed nor denied," according to BNAS Public Affairs personnel. The EPA and MEDEP have requested that the Navy perform a radiological survey. However, as of the publication of this report, the Navy has not yet committed to perform the requested survey.

Light Industrial Operations

Additional potential environmental concerns at BNAS include releases from light industrial operations on the installation that have historically existed in support of BNAS' mission and are shown on **Exhibit 43: Potential Areas of Environmental Concern Map**. These concerns include potential environmental contamination from transformers, paint shops, auto repair shops, medical and dental facilities, maintenance shops, hazardous materials storage and transfer facilities, generator buildings, a gas station, and an incinerator. To date, the Navy has not investigated these areas, therefore potential impacts to redevelopment are unknown at this time.

Exhibit 43: Potential Areas of Environmental Concern Map



Source: Matrix Design Group

Underground Utilities

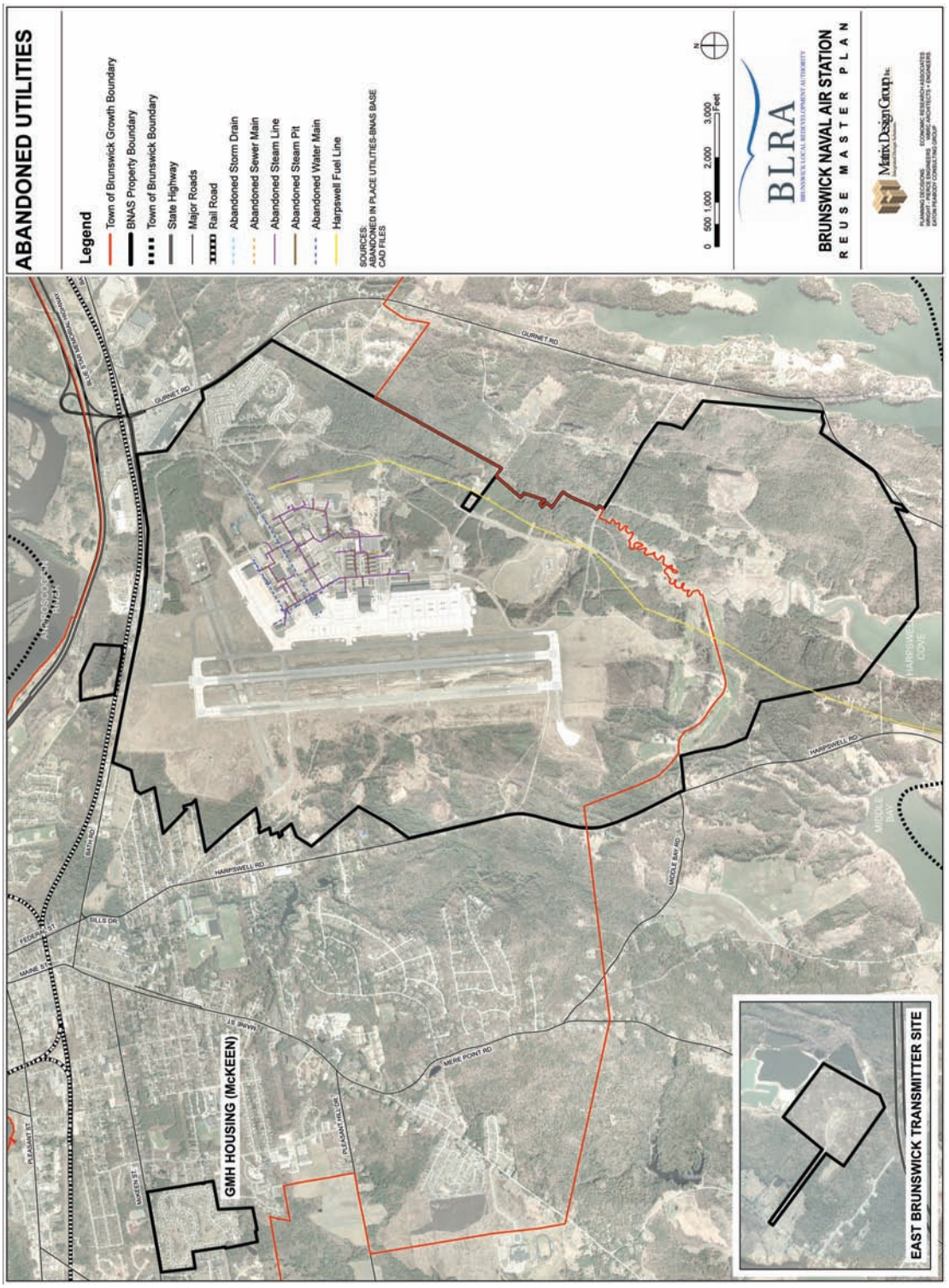
Throughout the base, several historic underground utilities have been abandoned in place. These abandoned utilities are shown on **Exhibit 44: Abandoned Utilities Map**. IRP Site 10 – Harpswell Fuel Line consists of two carbon steel pipelines of 8" and 12" diameters with welded joints, tar exterior coating, and an asbestos felt wrapping which run 12 miles from the US Naval Reserve in Harpswell to the Old Navy Fuel Farm on base. Three miles of pipeline exist on base, 0.5 miles exist in the Town of Brunswick, and 8.5 miles exist in the town of Harpswell. An Environmental Baseline Survey (EBS) was completed in 1997. According to the EBS, the pipeline has been inactive since 1991, at which time the two lines were drained, cleaned, and pressurized with nitrogen. Pressurization with nitrogen was reportedly maintained until August 1995, when the BNAS fuel farm was demolished and the pipeline valve stems were removed. The present integrity of the pipeline is unknown, and it appears that the Transient Quarters were constructed above a section of the fuel lines.

In addition to the fuel line, approximately 20,500 linear feet of up to 14" diameter asbestos-wrapped steam lines have been left in place in 2' x 2' concrete underground trenches throughout BNAS. The asbestos insulation around these pipes requires special handling procedures and off-site disposal if disturbed during redevelopment construction activities. Finally, due to the age of BNAS, many of the water supply lines are constructed of transite (an asbestos and concrete composite) pipe. If these pipes are not reused in the redevelopment plan or are disturbed during construction activities, they may require special handling procedures and offsite disposal as asbestos containing material (ACM).

Glycol Contamination and Methane Production

Prior to present RCRA regulations requiring the collection and proper disposal of hazardous materials, common practice at airports often involved the use of antifreeze compounds to de-ice planes directly on tarmacs prior to departure. The two most common deicers (ethylene glycol and propylene glycol) are known to biodegrade in anaerobic conditions and result in the production of methane. Methane is explosive at concentrations between 5 – 15%. Because methane is a gas, it can migrate through preferred pathways including utility corridors and collect in subsurface structures. This deicing practice may or may not have occurred at BNAS, but should be considered and the potential for methane be evaluated.

Exhibit 44: Abandoned Utilities Map



Source: Matrix Design Group

Asbestos and Lead-Based Paint

Due to the age of buildings at BNAS, asbestos and lead-based paint are likely present on-site. Comprehensive asbestos and lead-based paint surveys suitable for demolition purposes have not been performed on the majority of buildings. Several asbestos and lead-based paint surveys have been conducted at BNAS. This information should not be viewed as comprehensive and should be used with caution, because the surveys were only conducted on a representative number of buildings and did not always include walk through inspections of the units. Existing survey information is available in an inventory maintained by BNAS. Generally, the Navy does not pay for the abatement of asbestos and lead-based paint in buildings being transferred. Cost of abatement and proper disposal of these materials during redevelopment can be significant.

Pesticide and Herbicide Storage and Mixing Areas and Site-Wide Application

Historically, pesticides and herbicides have been stored, prepared, and applied throughout the base. IRP Site 17 is the location of former Building 95, where pesticides and herbicides were stored and mixed from 1955 to 1985. Soil samples collected from the area indicate DDE and DDT concentrations in excess of applicable state and federal standards. Several remedial actions have been conducted. In 1996, Building 95 was demolished and 1,260 cubic yards of contaminated soil were excavated and disposed at a permitted hazardous waste facility. In 1994, an additional 50 cubic yards of contaminated soil were excavated and removed. IRP Site 17 has a Long Term Monitoring Plan and is still under investigation. Pesticides are currently mixed and stored in Building 647 for the majority of the Main Station and Building 39 for the Golf Course. A site-wide assessment of potential pesticides and herbicides has not been conducted.

Building Drains, Drywells, and Combined Sewers with Potential Releases

BNAS does not have industrial operations generating an industrial wastewater stream. Small amounts of industrial-type wastes have been generated as off-specification waste chemicals and solvents. Historically, those wastes were disposed of in landfills, down drains, or transferred to the DRMO. BNAS discharges its sanitary wastes to Brunswick Wastewater Treatment Plant via Brunswick's partially combined storm and sanitary sewer system. Dumping waste chemicals down sanitary sewers contaminates sediment within the sewer and provides a pathway for potential release by sanitary sewer overflow during peak rainfall events. Sanitary sewer overflow can contribute to contamination at storm sewer discharge points. Storm sewers may transport environmental contaminants from their origin during rain events. Storm drainage from the central and southern runways, taxiways, and islands discharge to Mere Brook beaver marsh, while the outlying taxiways north of the operations area drain to the north into tributaries of the Androscoggin River. Storm drainage for the operations area discharges into the unnamed tributary bordering Site 9 that enters the northwestern branch of Picnic Area Pond. Storm sewer discharge points can be collection areas for contaminants and may require remedial investigation prior to redevelopment and property transfer.

Potential Suitability for Development

To provide an initial framework for the public visioning exercise, as well as provide the physical basis for the alternative master plan development process, an overall assessment of development suitability of the base was required. As part of this step, the natural resource, regulatory, and cultural factors identified during the existing conditions assessment were categorized as to the degree to which each factor would potentially impact the "suitability of development" of the land on which it is located. Three broad categories were created:

- Areas Least Suitable for Development
- Areas Moderately Suitable for Development
- Areas Most Suitable for Development

By understanding the potential impact on development each of these factors has, and by identifying the geographic areas covered by these factors as they are aggregated into one of the three categories above, a broad context for future land uses of BNAS property was determined. As a result of this effort, preliminary analysis indicates the following breakdown of physical suitability for potential development within the surplus property under consideration, as summarized below in **Exhibit 45: Development Suitability Table**. The paragraphs that follow discuss these three categories, the factors that contributed to each, and the geographic areas covered by each.

Exhibit 45: Development Suitability Table

Development Suitability	Planning Area									Total Acres	% of Total
	1	2	3	4	5	6	7	8	9		
Least Suitable	137	107	19	53	102	199	181	9	0	808	24%
Moderately Suitable	122	238	5	22	26	93	274	0	56	837	25%
Most Suitable	173	528	90	315	171	226	83	62	13	1,661	50%
Total Acres	**433**	**875**	**117**	**394**	**304**	**524**	**545**	**79**	**78**	**3,305**	**100%**

Source: Matrix Design Group

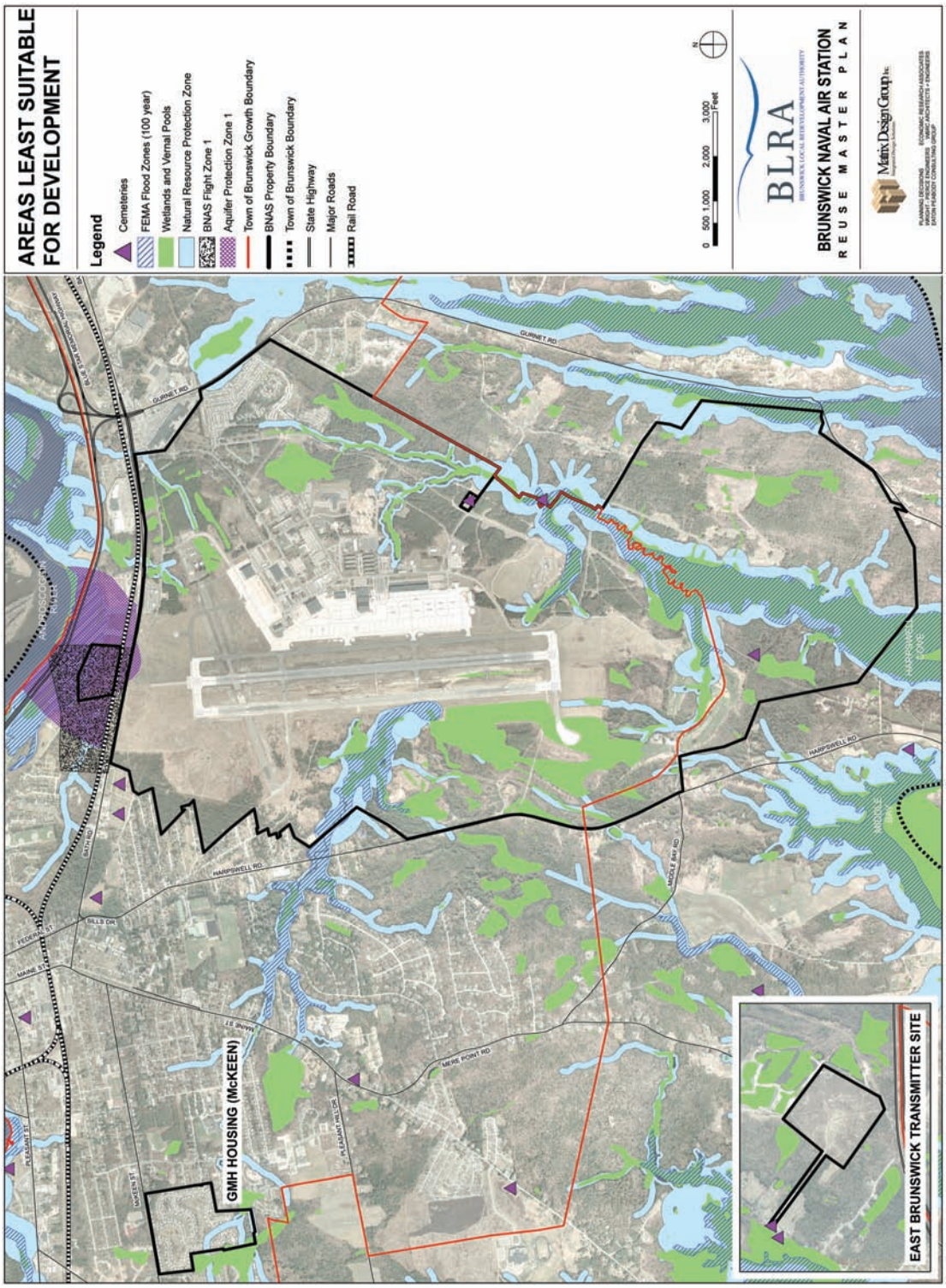
Areas Least Suitable for Development

The various natural resource, cultural, and regulatory factors described previously in this section that were identified as having attributes that severely restrict or prohibit future land uses or development are:

- FEMA Flood Zones
- Wetlands and Vernal Pools
- Natural Resource Protection Zone
- BNAS Flight Zone 1
- Aquifer Protection Zone 1
- Cemeteries

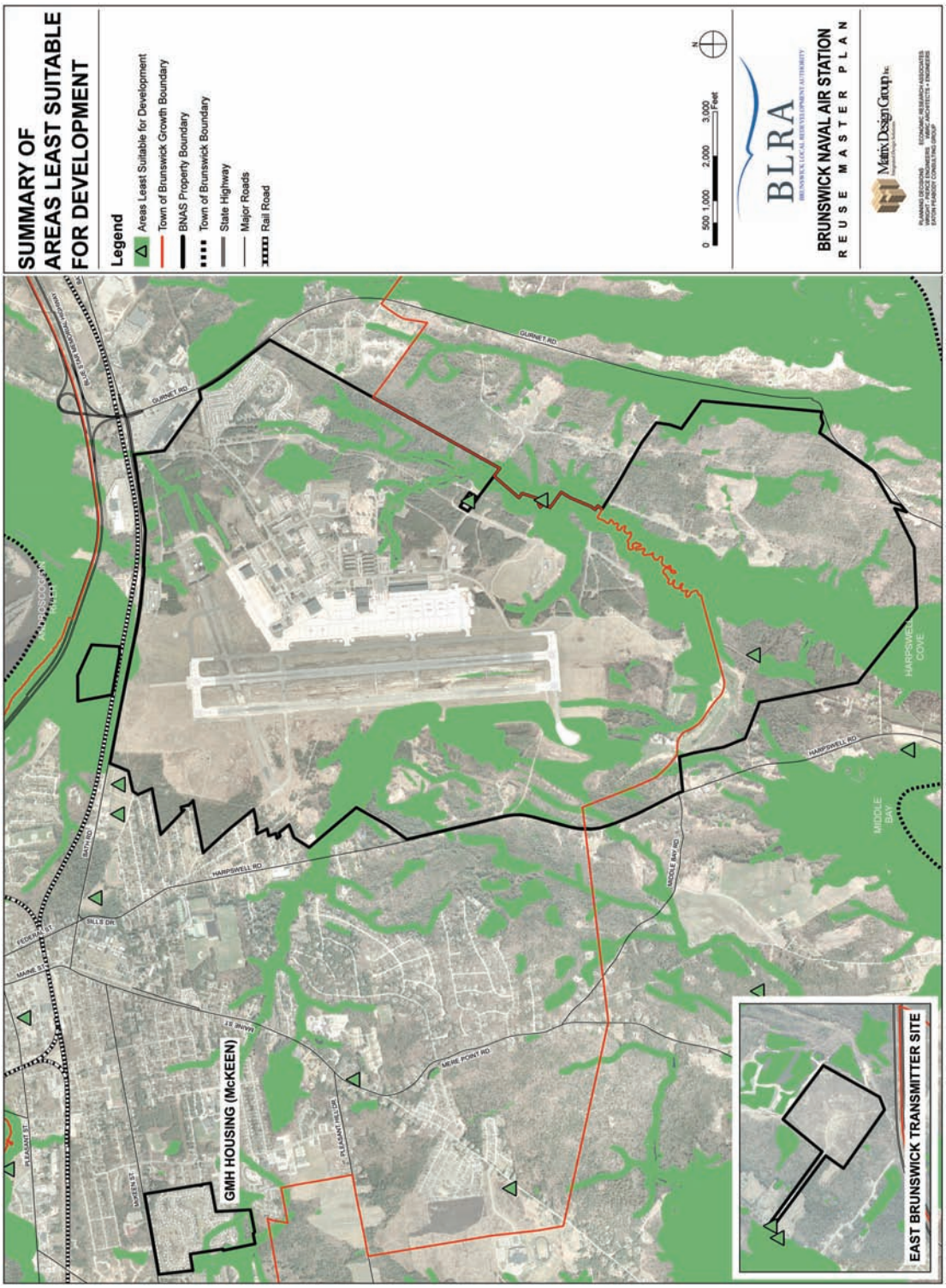
Due to the nature of these factors, land covered by one or more of these is considered to be generally undevelopable, or developable to a very limited degree. Depending upon the factor, development may be not permitted for legal, physical, or practical reasons, or permitted at very low densities, extremely restricted uses, or under special permit. **Exhibit 46: Areas Least Suitable for Development Map** shows the location or area covered by these six factors separately. **Exhibit 47: Summary of Areas Least Suitable for Development Map**, aggregates these factors into a single geographic coverage that represents the areas that should be considered as the least suitable for future development.

Exhibit 46: Areas Least Suitable for Development Map



Source: Matrix Design Group

Exhibit 47: Summary of Areas Least Suitable for Development Map



Source: Matrix Design Group

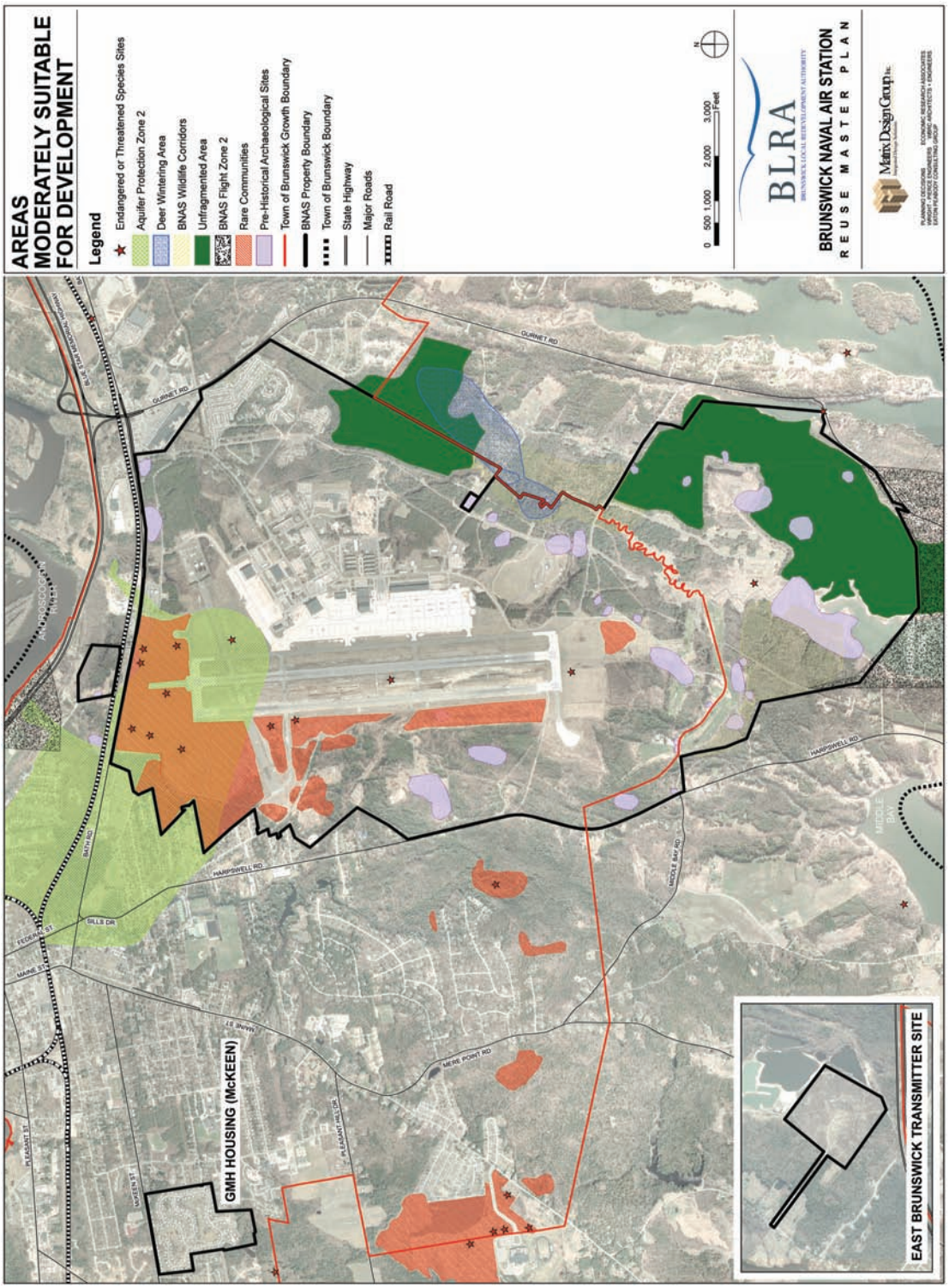
Areas Moderately Suitable for Development

The factors identified as having attributes that moderately restrict or limit future land uses or development include:

- State Endangered / Threatened Species Sites
- Aquifer Protection Zone 2
- Deer Wintering Areas
- Wildlife Corridors
- Unfragmented Areas
- BNAS Flight Zone 2
- Rare Communities
- Historical / Archaeological Sites

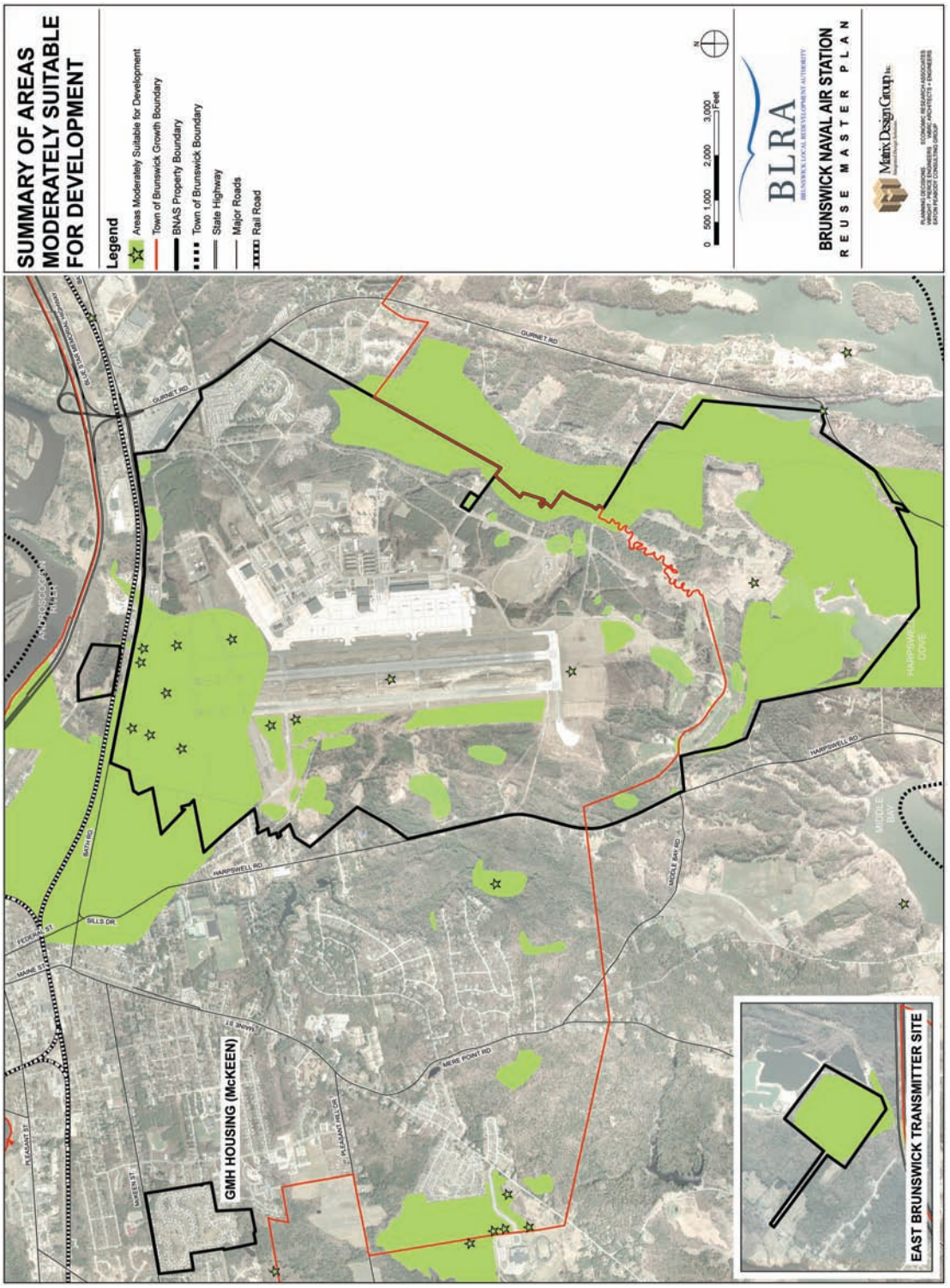
For the purpose of this study, land covered by one or more of these factors is considered to be developable in a limited manner, and typically only when certain land use, density, or other requirements are met. While these areas may be developable from a physical perspective, due to public policy or community goals and objectives, development is discouraged or constrained to some degree. **Exhibit 48: Areas Moderately Suitable for Development Map** shows the location or area covered by these eight factors separately. **Exhibit 49: Summary of Areas Moderately Suitable for Development Map** aggregates these factors into a single geographic coverage that represents the areas that should be considered as only moderately suitable for future development.

Exhibit 48: Areas Moderately Suitable for Development Map



Source: Matrix Design Group

Exhibit 49: Summary of Areas Moderately Suitable for Development Map



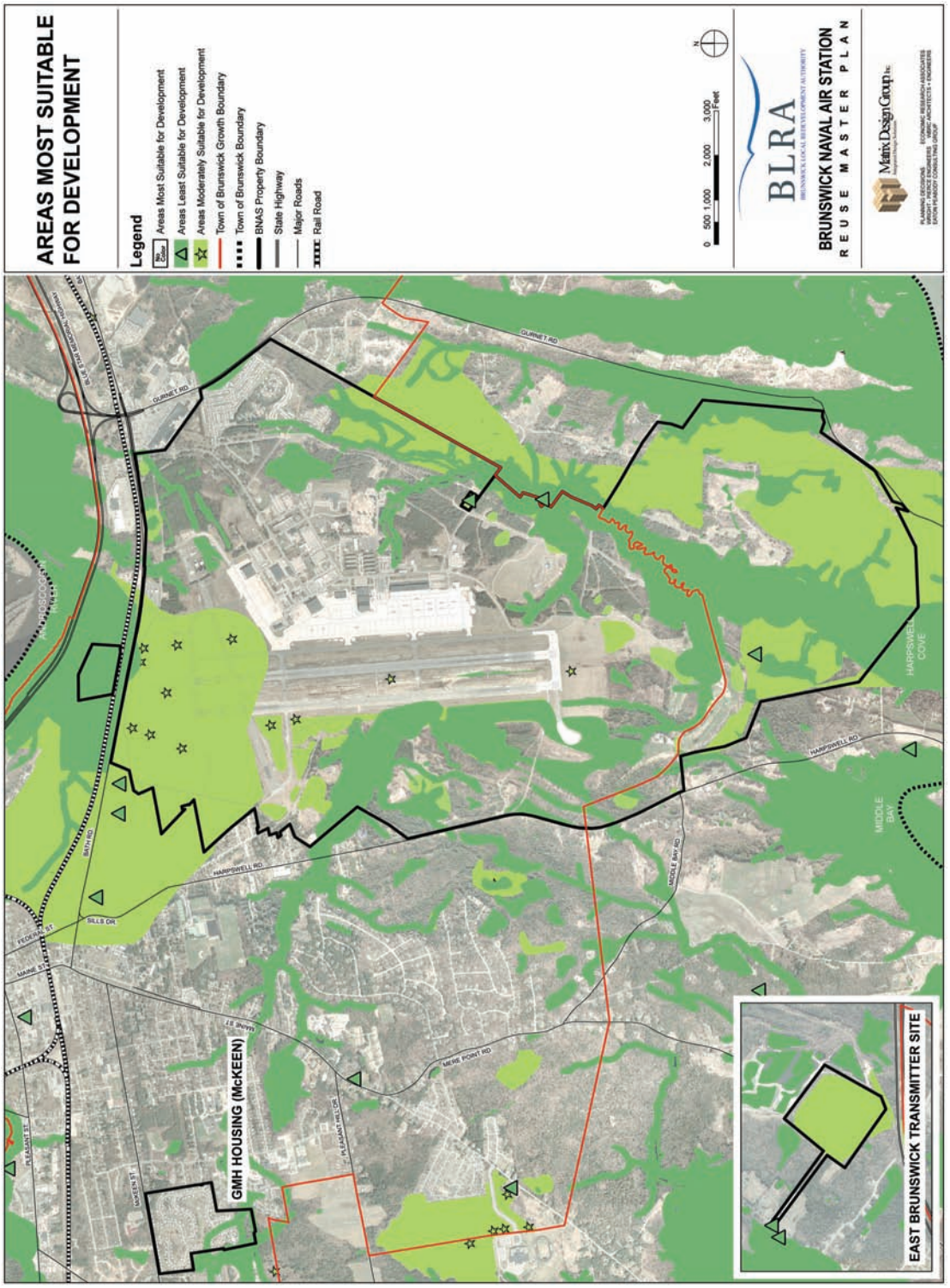
Source: Matrix Design Group

Areas Most Suitable for Development

Areas Most Suitable for Development are characterized as those areas where no factor is noted that qualifies under either the "Least Suitable" or "Moderately Suitable" categories above. Future development in these "Most Suitable" areas is certainly not a foregone conclusion; in fact, there may be environmental, market, and other reasons why some of this land will not be identified for future development. At this time, these areas simply represent the territory for which no major physical, regulatory, or other factors that specifically restrict or prohibit new development have been identified. **Exhibit 50: Areas Most Suitable for Development Map** identifies this land, which consists of those uncolored areas, or those areas not covered by the "Least Suitable" or "Moderately Suitable" category colors. These "Most Suitable" areas may still be restrained in their development potential to some degree by other issues, such as topography, zoning, or other local and/or state development regulations.

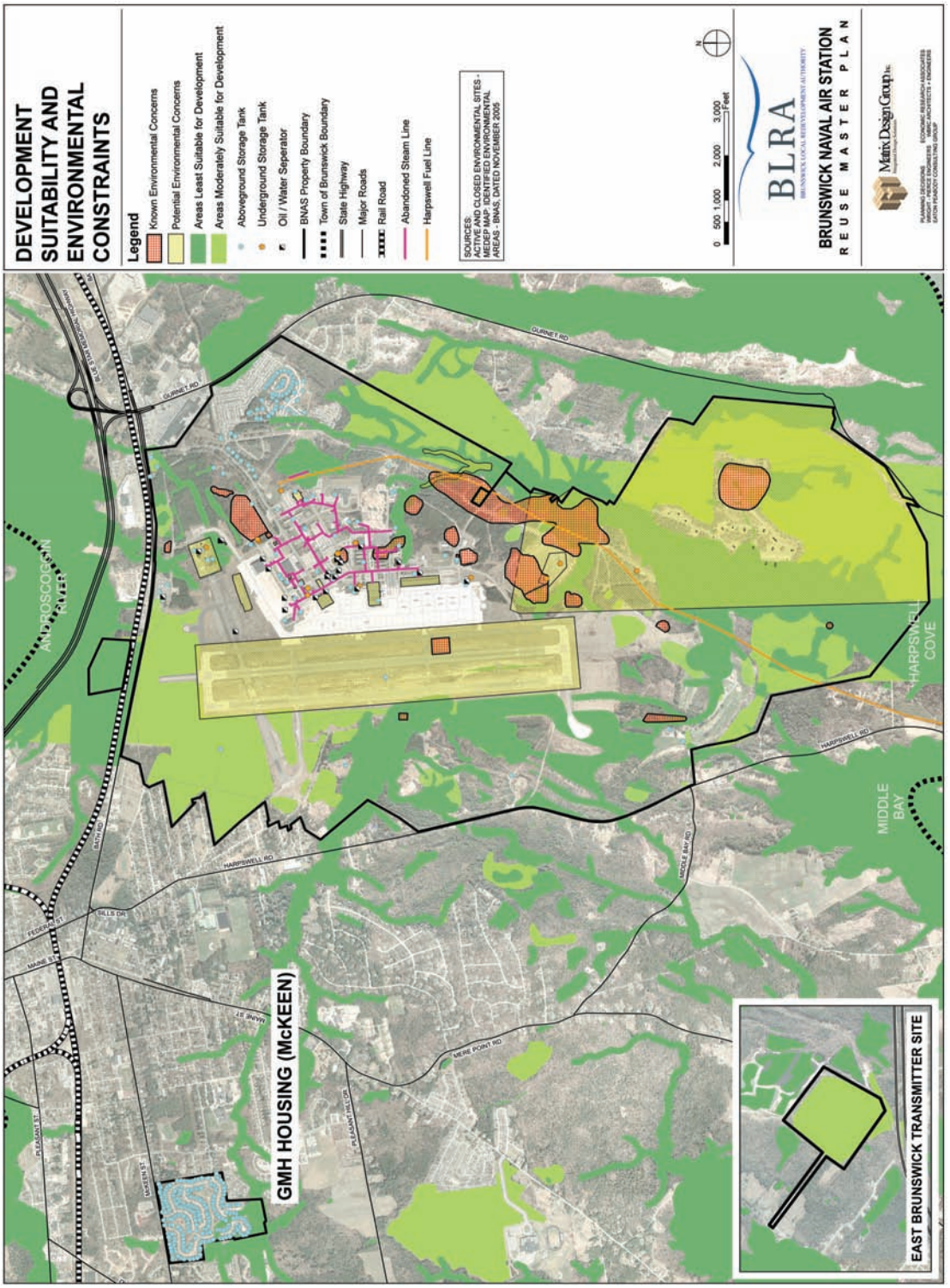
While the preliminary assessment of the property's overall physical development suitability has been determined, other constraints will need to be integrated into the overall analysis of where redevelopment could occur, to what extent it could occur, and at what cost. The most significant aspect of that more refined assessment is the potential environmental contamination of the site, including known areas of environmental concern, as well as those areas that need additional investigation, as shown on **Exhibit 43: Potential Areas of Environmental Concern Map**. The following map, **Exhibit 51: Development Suitability and Environmental Constraints Map**, illustrates this potential impact that existing and potential environmental constraints will have on the redevelopment of the property.

Exhibit 50: Areas Most Suitable for Development Map



Source: Matrix Design Group

Exhibit 51: Development Suitability and Environmental Constraints Map



Source: Matrix Design Group

Facilities Reuse Workshop

An assessment of significant buildings existing on the property was conducted as part of the Existing Conditions phase, and is described earlier in this section. Based on that information and an understanding of viable market opportunities for redevelopment, the BLRA staff and Matrix Planning Team members convened a half-day internal workshop that focused on potential future uses for 48 major buildings. Each facility was evaluated in terms of its adaptability for public / private-sector use in its existing capacity, or for other uses. Each building was ranked in terms of its potential requirements to adapt to meet the needs of the range of land uses anticipated for redevelopment as well as for land use preferences obtained from the Public Visioning process. Rankings were given for minimal, moderate, or significant adaptation needs; buildings considered not adaptable for specific uses were also noted. In addition, conclusions were reached related to the compatibility of potential uses for each building, based on the characteristics envisioned for the various planning areas established as part of the evaluation process. See **Appendix D** for facilities evaluation matrices detailing both airport and non-airport scenarios.

Airport Feasibility Study Conclusions / Recommendations

The Aviation Feasibility Study analyzed the potential for civilian aviation activity at Brunswick Naval Air Station after the US Navy is scheduled to leave in 2011, and concluded that civilian aviation activity at BNAS is feasible.

The Feasibility Study used a multi-phased screening process to identify and evaluate potential civilian aviation activities, the likelihood that they could occur at Brunswick Naval Air Station, the economic impact of those activities, as well as the potential regional benefits and environmental impacts of civil aviation activity. The primary objective of the Aviation Feasibility Study was to provide sufficient data for the Brunswick Local Redevelopment Authority to decide:

- Whether civilian aviation activity is potentially feasible at BNAS after the Navy leaves in 2011
- What portion of the Navy airfield should be used as a civilian airport, and which portion of the airfield should be transferred from the Navy to the BLRA through Public Benefit Conveyance
- If the financial and economic impact of operating a civilian airport, including potential employment, enhances its viability as well as regional benefits
- Whether environmental issues would impact the surrounding community or prevent civilian aviation activity at BNAS

It is important to note that if the BLRA decides to proceed with civilian aviation reuse, an airport master plan (AMP) will need to be prepared before the airfield is transferred by the Navy. The AMP would be partially funded by FAA and Maine DOT and would address those four issues, as well as others, in greater detail. This Aviation Feasibility Study is one of two planning studies being conducted by the BLRA, the other being the Master Reuse Plan. In making their decision about whether to proceed with aviation reuse and request a PBC for the airfield, the BRLA will consider not only the information presented in this aviation study but also the recommendations presented in the Master Reuse Plan that is being prepared separately, in addition to considering other sources of information, including extensive public input.

The Aviation Feasibility Study does not draw any conclusions or make any recommendations concerning the overall highest and best use of the airfield compared to possible non-aviation uses; its sole focus is the potential viability of civilian aviation reuse at BNAS. The Aviation Feasibility Study process can also be described as a filter, starting with large concepts and filtering the options to identify the most likely aviation scenarios, as described below.

Based on this analysis, it was concluded that a number of civilian aviation activities could potentially occur at BNAS, and that incentives provided by the State of Maine such as the Pine Tree and Military Redevelopment Zones, as well as the North Star Alliance among others, would make BNAS even more attractive to prospective tenants.

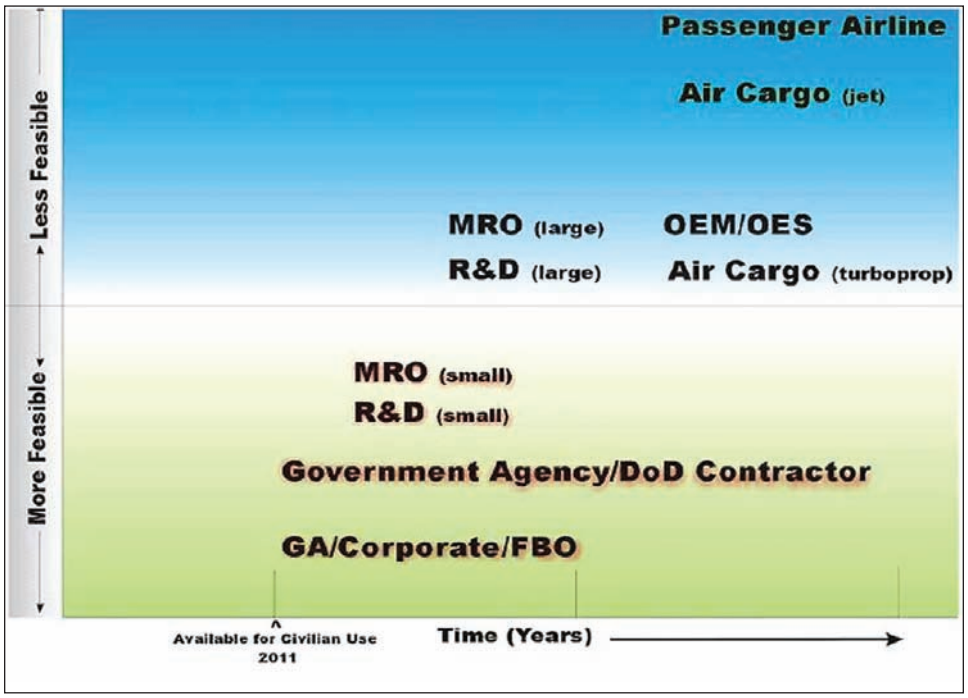
The likeliest civilian aviation activities that would occur at BNAS were identified as:

- Fixed Base Operator (FBO) - General and Corporate Aviation
  General and corporate aviation activities could include flight training, charter and air taxi service, corporate headquarters/flight department, fly-in communities, etc. FBO companies located in Maine have already expressed an interest in establishing an operation at Brunswick if it becomes a public-use airport.
- Aircraft Manufacturing and Maintenance, Repair and Overhaul (MRO)
  Both general aviation and air carrier aircraft are increasingly made with composite materials (such as Very Light Jets – VLJ), and could be manufactured and/or maintained at Brunswick.
- Government Agencies
  Agencies such as the Department of Homeland Security, NOAA, FAA, Department of Interior, etc., operate and maintain large fleets of aircraft. Department of Defense (DoD) contractors range from small local firms to international corporations, and large contractors such as General Dynamics and Pratt & Whitney have existing operations in Maine. They, as well as other large companies such as General Electric, Boeing, Lockheed Martin, etc., manufacture and maintain aircraft and engines for civilian and military agencies, and their business has grown significantly in the last six years.

- Aerospace Research and Development (R&D)
  Both small firms and large defense contractors conduct advanced R&D. The US Government is one of the largest sponsors of aeronautical research and development in the world, and has been rapidly increasing its investment in new technologies such as unmanned aerial vehicles (UAV), hypersonic flight, etc. BNAS has the facilities to accommodate that type of R&D activity, and local firms engaged in advanced R&D have expressed an interest in locating at BNAS if it becomes a public-use airport.

Exhibit 52 shows the relationship between time and the feasibility of different civilian uses for the BNAS airport.

Exhibit 52: Civilian Aviation Activities



Source: Edwards and Kelcey

The analysis concluded that scheduled passenger and cargo airline service would be much less likely to occur at BNAS, for a number of reasons:

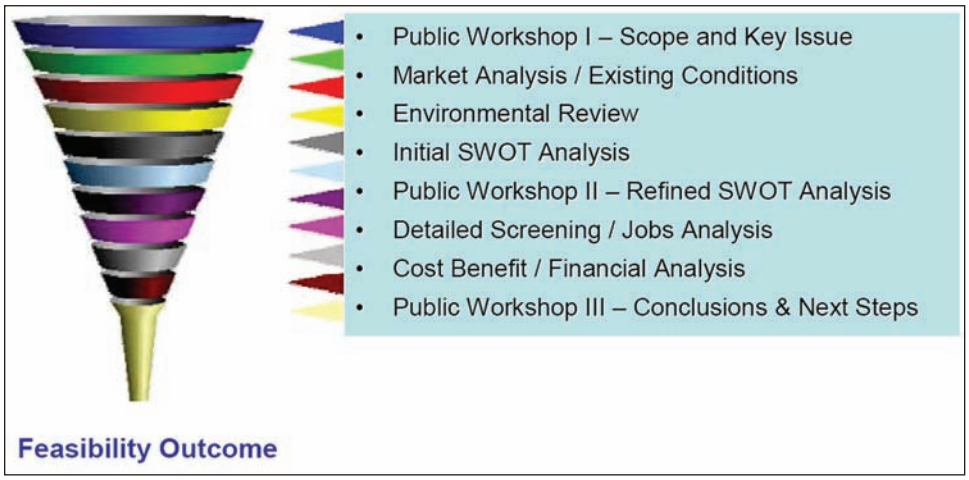
- The passenger market in the Midcoast Region is not large enough, by itself, to support service by a major airline. Discussions with both airline and trade industry representatives indicated that Brunswick is too close to Portland Jetport to support airline service at both airports. Airlines have made large investments at Portland Jetport, and because Portland does not have delays there are few incentives for airlines to provide service to BNAS as well.

- While BNAS has excellent airfield facilities, the terminal area was not designed for airline service. Additional terminal area facilities would need to be constructed, and such improvements would cost millions of dollars, only a portion of which would be eligible for federal and state grants.
- Several airports in the region, including Augusta State, Knox-County Rockland, and Hancock County-Bar Harbor have commuter airline service and are designated by US DOT as Essential Air Service (EAS) airports. As a result, airline service is subsidized by the federal government, and airport managers have indicated that if the subsidies were discontinued they would likely lose airline service. Under current DOT criteria, Brunswick is too close to Portland Jetport to qualify for EAS designation or DOT subsidies.
- Air cargo service at both Portland Jetport and Bangor Airport was examined. Most of the cargo generated at LL Bean is trucked to Boston and New York airports for air shipment, as is the seafood caught off the Maine coast. Air cargo companies such as FedEx, UPS, and DHL are primarily freight forwarders that decide how to ship packages. Those companies have established air hubs and mini-hub facilities at airports outside of Maine. As a result, although Brunswick offers excellent facilities for air cargo companies, current market trends indicate that freight forwarders will continue to truck large volumes of cargo generated in Maine to larger regional airports out of state. It is possible that Brunswick could be served by smaller cargo feeder carriers using single and multi-engine turboprop airplanes, as seen at Auburn-Lewiston Airport.

Study Process

The Aviation Feasibility Study used a screening process based on the SWOT analysis. The screening process involved a series of iterations examining a broad cross-section of aviation uses, and narrowing the potential aviation scenarios based on market trends and regional factors. An extensive public outreach program was also a key component of the study process, which included three public information meetings and workshops. **Exhibit 53**, shown below, reflects the study process followed.

Exhibit 53: Aviation Feasibility Study Process



Source: Edwards and Kelcey

The SWOT analysis was used to evaluate each alternative, and served as the primary basis for determining which of the aviation scenarios were considered to be the most feasible. Based on that analysis, a public-use airport was determined to be financially feasible at BNAS. Certain sectors of the civilian aviation market have been and are projected to continue growing very rapidly beyond 2011, when the US Navy is scheduled to leave BNAS. As a result, there are opportunities to attract those businesses to BNAS as future tenants.

BNAS as a Civilian Airport

Strengths

- The BNAS airfield facilities are rated in excellent to good condition and the Navy has committed to maintaining them in that condition until they are turned over to a civilian authority.
- The airfield could be obtained through PBC at little or no cost to a public authority.

- The composite industry cluster that is growing in Maine, particularly in the Midcoast Region, would be attractive to aircraft firms that manufacture and repair composite aircraft and parts.
- State incentives such as Pine Tree Zone, Military Redevelopment Zones, as well as the North Star Alliance, among others, will increase the attractiveness to locate at Brunswick.

Weaknesses

- It is possible that a civilian airport would require subsidies for a period of 5 to 10 years.
- Based on the current Navy redeployment schedule, the airfield will not be available for civilian use until 2011.
- Current military security requirements increase the difficulty to market the base to potential civilian tenants.

Opportunities

- Many sectors of the aviation industry are projected to continue to grow beyond 2015.
- BLRA has already received expressions of interest from aviation companies interested in locating on the base if it becomes a public-use airport.
- There will be a period of four years while the Navy will maintain and operate the base during which an on-going marketing and research campaign can determine if there is adequate demand from civilian aviation companies to operate a viable civilian airport.

Threats

- 24 former military airfields have been converted to civilian use since the early 1990s, many of which are targeting the same large civilian tenants that Brunswick would market.
- Of the 3,400 public-use airports in FAA's National Plan of Integrated Airport Systems (NPIAS), approximately 500 are former military airports, many of which are also marketing similar tenants.
- Rising fuel costs and other economic factors could decrease demand for aviation services and impact the anticipated growth rate of certain industry sectors.
- A number of states, particularly in the southern US, are offering large subsidies to aircraft manufacturing and repair firms, as well as defense contractors and R&D companies, to locate their facilities in their particular state. In addition, some states offer lower energy and labor costs, as well as lower business and personal income taxes, than Maine.

Economic Impact of a Civilian Airport

The Aviation Feasibility Study analyzed the potential economic impact of civilian aviation activity on the community, the Midcoast Region, and the state. In general, aviation-related businesses hire highly skilled and educated employees, pay higher salaries than non-aviation commercial and industrial sectors, and offer better benefits. Each aviation industry sector was examined in terms of potential employment, and a range of employment levels was identified based in part on actual companies located at former military bases around the country. **Exhibit 54** shows potential civilian employment at BNAS.

Exhibit 54: Potential Brunswick Airport Civilian Employment

	Low	High
Homeland Securtiy / Coast Guard	40	400
MRO / Manufacturer / DOD Contractor	200	2,500
Reasearch & Development / Space	20	200
VLJ / Composite Manufacturer	20	100
Fixed Base Operator (FBO)	5	50
Total Airfield Employment	**285**	**3,150**
Annual Payroll ($ Million)	**$26.7**	**$294.8**

Source: Edwards and Kelcey

Annual payroll was calculated based on an average salary of $45,000 per employee, which is considered conservative compared to some aviation companies that pay as much as $75,000 per employee. In addition, the secondary benefits to the community could also be significant. In **Exhibit 55**, the calculations were made based on the FAA's *Estimating the Regional Economic Significance of Airports*.

Exhibit 55: Potential Brunswick Airport Regional Economic Benefits

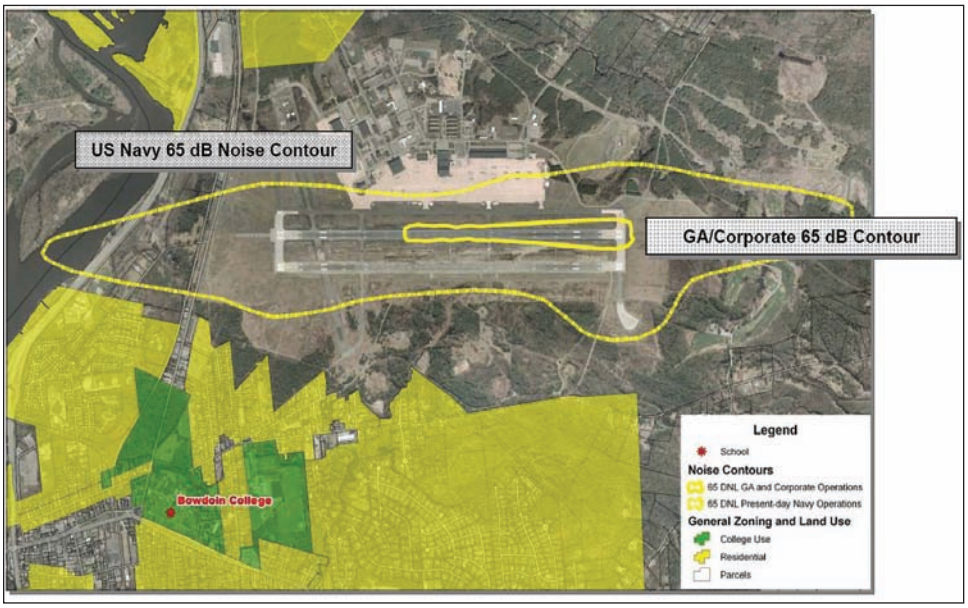
	Low	High
Potential Annual Payroll	$26.7	$294.8
Indirect Benefit (Visitor Spending)	$4.5	$13.3
Induced Benefit (Multiplier x .06)	$15.8	$176.9
Total Economic Benefit	**$47**	**$485**

Source: Edwards and Kelcey. All figures are in Dollars (Million)

Environmental Issues

The Aviation Feasibility Study examined three specific environmental issues: aircraft noise; stormwater runoff; and aircraft emissions. The Navy prepared a noise study in 1985 that included field measurements of military aircraft operations. The types of military aircraft operated in 1985 (such as P-3 Orions and C-130s, etc.), as well as the level of activity (annual operations) are very similar to what occurred at BNAS in 2006. For comparative purposes, the 65 dB noise contour from a very active general and corporate aviation airport (Beverly, MA) that has 50% more takeoffs and landings than occurred at Brunswick was overlaid on **Exhibit 56: Noise Impact Map**.

Exhibit 56: Noise Impact Map



Source: Edwards and Kelcey

The aircraft at Beverly Airport were single and multi-engine piston and turbine powered general aviation airplanes, including a large number of corporate jet aircraft. Based on this market analysis it is not anticipated that a civilian airport at Brunswick would generate 85,000 takeoffs and landings per year, however, forecasts of civilian aircraft operations would be examined in more detail in an airport master plan. For comparative purposes, the Maine Aviation Systems Plan Update estimated in 2006 that Auburn-Lewiston, Augusta, and Wiscasset Airports each had less than 40,000 operations per year.

65 decibels is a noise level that is used by a number of federal and state agencies, including FAA, Housing and Urban Development (HUD), EPA, etc., as a threshold for land use compatibility. The existing land uses in the vicinity of BNAS are primarily to the west

of the base, and outside of both the Navy and general aviation/corporate 65 dB noise contour. If the base is used as a civilian airport, it is recommended that the Town of Brunswick use land use controls, including zoning, to prevent noise sensitive land uses being developed closer to the airfield. In addition, it will be important to control the construction of towers, tall buildings, and growing vegetation close to the runways in order to comply with FAA's airspace criteria.

BNAS is located over the Mere Brook watershed. Mere Brook is classified by Maine DEP as an urban impaired stream and was placed on the Maine's 303(d) list for impairment to aquatic life because of industrial (military) and urban non-point source (NPS) pollution. Many waterbodies listed on the 303(d) list require a total maximum daily load (TMDL). A TMDL is a legal requirement under the Clean Water Act to designate sources of impairment, identify instream problems, and describe what is required to be done for a waterbody to meet water quality standards. A TMDL for Mere Brook is scheduled for 2008, therefore participation in the implementation of the TMDL (if developed) will likely be required as part of conversion to a civilian airport.

Maine DEP, Bureau of Land & Water Quality, and Stormwater Management Chapter 500 standards apply to Mere Brook. In terms of stormwater runoff, the Navy currently has a Site Law Permit from Maine DEP. Redevelopment resulting in alterations to any existing impervious surface (building, parking lot, runway, etc.) would require that the stormwater management systems be reconstructed to comply with the new general standards of Chapter 500 to an extent practicable as determined by Maine DEP. Any redevelopment of the Naval Air Station would also require the airport sponsor or developer to comply with the Urban Impaired Stream Standard of Chapter 500. To comply with this standard, the sponsor/developer would need to mitigate any adverse water quality impacts through an on-site or off-site project (for example by turning a parking lot or the outboard runway back into a meadow), or pay a compensation fee.

BNAS currently complies with federal and state stormwater regulations, and the existing aircraft deicing facilities used by the Navy exceeds current US EPA standards. Civilian aircraft operators could use the Navy's deicing facilities, and if no changes were made to the existing deicing storage, dispensing, or collection facilities, no changes to the Storm Water Pollution Prevention Plan (SWPPP) or state Site Permit would be required. US EPA is in the process of updating its glycol deicing management regulations, which may impact future civilian aircraft deicing activities at BNAS. If the BLRA decides to proceed with the civilian airport option, the Navy will need to include a review of aircraft noise and stormwater runoff in its NEPA Environmental Impact Statement (EIS).

Regarding aircraft emissions, there is rapidly growing momentum in the US, and particularly in Europe, to significantly decrease emissions and enhance the environmental compatibility of commercial aviation. At many airports in the US, ground vehicles have converted to natural gas and other alternative fuels.

The European Union, under its Joint Technology Initiative, has adopted very aggressive emission reduction targets over the next six years (shown below). A consortium of European aircraft manufacturers and government agencies have committed almost $2.3 billion towards the research and development to achieve these goals.

European Clean Sky Goals – 2013

- 80% cut in NOx emissions
- 50% cut in perceived aircraft noise
- 50% cut in CO2 emissions per passenger/mile
- A green design, manufacturing, maintenance and disposal product life cycle

The EU is proposing that the International Civil Aviation Organization (ICAO), of which the US is a member, adopt these goals as international standards. The British government is also adopting a plan to include commercial aircraft in their emissions trading scheme. In addition, a new organization formed by Richard Branson and former Vice President Al Gore, Virgin Earth, is offering a $10 million prize to any individual or company that can develop practical technology that will reduce carbon dioxide in the atmosphere by 100 million tons per year. Branson's airline, Virgin Atlantic, is adopting numerous emission reduction operating procedures, such as being towed to the runway versus using aircraft engines, etc. Simultaneously, aircraft engine manufacturers are actively testing alternative fuels, and the US Air Force has successfully tested alternative fuels in its aircraft and is working to make greater use of these fuels throughout its fleet.

In addition to enhancing the environmental compatibility of aircraft, these new green technologies are also presenting new opportunities for private industry and government agencies, and BNAS could serve as a location for some of these new R&D and production technologies, which are projected to increase significantly over the next decade.

Financial Viability

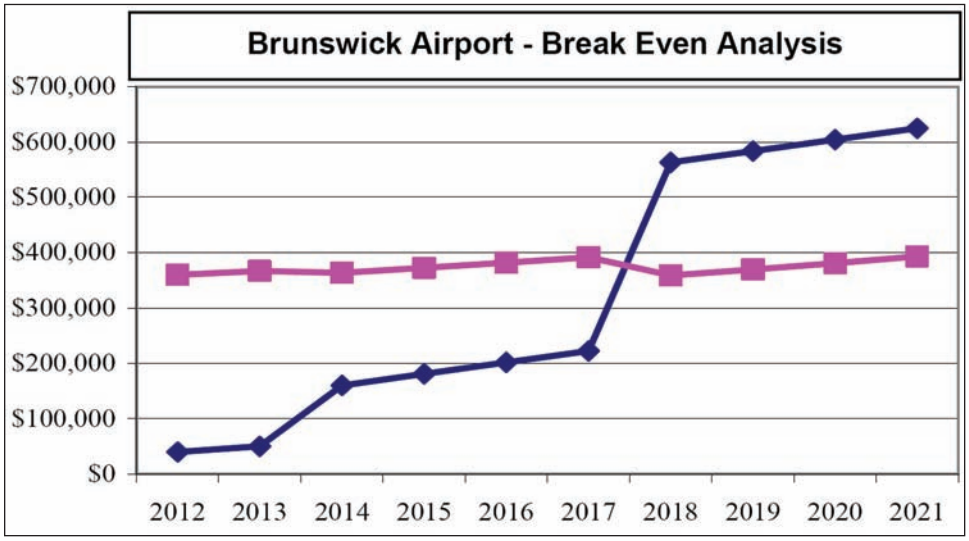
A key question concerning future civil aviation activity at BNAS is: would an airport be financially self supporting? Future airfield operating and maintenance (O&M) costs were analyzed, as well as potential revenues that could be generated by civilian tenants. The financial structure of existing airports in the region was also examined, as well as airport industry lease rates, charges and fees. The analysis considered the amount and type of space available in the airfield buildings at BNAS, and revenue projections were developed based on conservative estimates of industry rates and charges.

A key factor in terms of future operating and maintenance (O&M) costs is that the Navy has committed to maintaining the airfield in its current excellent to very good condition until it is turned over to another entity. As a result, the pavement should not need reconstruction for a period of 15 – 20 years after it becomes a civilian airport, and operating and maintenance costs will be relatively low.

Annual O&M costs for a fully functioning civilian airport was estimated to be approximately $520,000 (in 2006 dollars), which would include both airport personnel and equipment. Both FAA and Maine DOT offer grants for eligible airport capital improvement projects, but in general do not support O&M costs. Those costs would be offset by revenue generated by the airports tenants and users.

Using conservative lease rates, Building 250/Hangar 4 could generate an estimated $800,000 annually in revenue, which would more than cover annual O&M costs. Between all of the airfield buildings, including Hangars 4, 5 and 6 and Buildings 4 and 200, there is almost 500,000 S.F. of hangar, office, and shop space that would be available for lease to civilian tenants, which could generate as much as $1.5 million in revenue annually. Aircraft parking, tiedown, landing, and fuel flowage fees could generate an additional $300,000 annually, so the total potential revenue could equal almost $2 million annually. **Exhibit 57** shows the break-even analysis.

Exhibit 57: Airport Break-Even Analysis



Source: Edwards and Kelcey. Purple line represents costs over time; blue line represents revenue.

As with any start-up business, it is possible that a civilian airport could have an operating deficit for as much as five to ten years (as shown in the Break Even chart), which represents the worst-case scenario in terms of financial viability. Key factors in both the size and time frame of an operating deficit would be the ability to control O&M costs,

attract civilian tenants, and charge industry-standard lease rates and fees. The fact that the Navy will maintain and operate the base until 2011 would provide an opportunity for the BLRA to market the base and confirm if the demand for access to a civilian airport would in fact cover its operating costs. There are a number of potential sources of funding to support an operating deficit, including revenue from non-aviation commercial development on the base, general fund appropriation from the State of Maine, tax incremental financing (TIF), state income tax increment financing, as well as other sources.

Impact of a Civilian Brunswick Airport on Other Airports

If the BLRA decides to operate a civilian airport at BNAS, what impact would it have on the existing airports in the region? That question was analyzed in several ways:

- Individual airport master plans, the Maine State Aviation Systems Plan Update (MASPU), FAA's National Plan of Integrated Airport Systems (NPIAS), and FAA's New England Regional Airport System Plan (NERASP) were analyzed. Each plan projected that aviation activity in the region will continue to grow throughout the next decade. Based on the types of aviation services projected at each airport, BNAS could serve several niche markets that would not compete directly with the region's other airports, such as major aircraft manufacturing, maintenance, repair and overhaul (MRO), defense contracting, and aerospace research and development (R&D), etc.
- The MASPU recommended that Wiscasset Airport be upgraded to a Level I facility, and its runway be extended to 5,000 feet and a precision instrument approach be published. If BNAS were operated as a public-use airport, Maine DOT may reexamine those recommendations and determine whether BNAS adequately fills that role.
- Discussions were also held by Edwards and Kelcey with airport managers in the region. The managers acknowledged that a civilian airport at BNAS could draw some of their general aviation and corporate traffic, but that BNAS would not significantly impact the level of activity at their airport. Airport managers that had scheduled airline service did not anticipate that the airlines would move to Brunswick, which is consistent with other results in this study.
- Based on aircraft registration data maintained by Maine DOT, an analysis was prepared to assess approximately how many general aviation aircraft could be attracted to BNAS if it were a civilian airport. The BNAS catchment area was defined as the radius connecting the mid- points between BNAS and Portland Jetport, Auburn-Lewiston Airport, Augusta State Airport, and Knox County-Rockland Airport. Wiscasset Airport lies between BNAS and Rockland and was included in its catchment area.

- For the purposes of this analysis, it was assumed that there would be no access restrictions at BNAS as a civilian airport, that the airport operating rates and charges (such as landing, parking, and tiedown fees, etc.) would be equivalent to other airports, and that there would be a full service FBO in place at BNAS. Based on those assumptions, a Brunswick Airport could potentially attract a large share of the airplanes whose owners live within its catchment area.

There are three key factors in terms of attracting General Aviation traffic to an airport:

- Facilities - Brunswick would offer larger facilities and more capacity than the other airports in the region, and the 8,000 foot runway would be very attractive to high-performance general aviation and corporate airplanes in the area (and beyond). Maintaining the instrument landing system (ILS) on Runway 1R will be important for all-weather access for those airplanes.
- Services - a good FBO is essential because, a) they provide quality service (fuel, maintenance, flight training, supplies, etc.), and almost as importantly, b) can effectively market the airport and bring in new business quickly. A good FBO would also attract airplanes from outside the catchment area, in which case Brunswick would likely attract more based aircraft.
- Cost and convenience - are both very important factors for G.A. airplane owners. If tiedown and hangar lease rates, fuel prices, landing and parking fees are competitive with other airports in the region, Brunswick would be a very attractive airport. Since pilots typically lease their hangars and tiedowns, they can move to other airports very easily. It is also likely that Brunswick would attract new airplanes not currently registered in the state, such as new corporate jets and turboprops, particularly given the recent change in state tax law.

In terms of identifying the potential impact on surrounding airports, 73 based airplanes at Brunswick would indicate a 'worst-case' scenario for the other airports, but even then the region's other airports would still have more than 75% of their existing based airplanes left, which is consistent with what airport managers indicated. FBOs located at some regional airports have already expressed interest in establishing an operation at Brunswick if it becomes a public-use airport, and maintain their existing FBO as well. In other words, they anticipate there would be sufficient traffic to support both operations. **Exhibit 58** shows the projected based aircraft growth rate.

Exhibit 58: Based Aircraft Projected Growth Rate

Year	Based A/C - Brunswick Airport	Growth Rate *
2011	73	5.0% (2006-2011)
2021	80	9.5% (2011-2021)

*** Source: Maine Aviation Systems Plan Update, Chapter 4, Table 4-7**

Source: Edwards and Kelcey

- The projected growth rate of based aircraft presented in the Maine Aviation Systems Plan Update was applied to BNAS to identify potential growth (table above). That growth rate would be analyzed in more detail in an airport master plan.
- Experience at former military and joint-use bases, such as Pease and Westover Air Reserve Base in Chicopee, MA, for example, indicate that using a base as a civilian airport develops niche markets, and is not a zero-sum proposition – its growth doesn't come at the expense of the airports around it.

What Are the Next Steps?

Based on the conclusions and recommendations presented in the Aviation Feasibility Study and the Master Reuse Plan, as well as input from the public, the BLRA will decide whether to proceed with a civilian airport option. If the MRRA decides to operate a civilian airport at BNAS, then what are the next steps?

The first step would be to undertake a more detailed and extensive marketing program of potential aviation tenants. The initial focus should be on a wide range of aviation firms presently operating in Maine. Secondly, FAA has indicated that an airport master plan will need to be prepared, and both FAA and Maine DOT would provide financial support for the plan. Several key products would result from an airport master plan: an approved Airport Layout Plan (ALP); an Airport Capital Improvement Program (ACIP); and an environmental assessment (EA). A number of other products, such as a detailed financial and business plan, would also be developed as well. Airport marketing studies, however, are not eligible for FAA grants.

Airport marketing plans are not eligible for FAA funding, and need to be undertaken separately. In addition, both Maine DOT and FAA will need to include Brunswick in their respective system plans in order for the airport to be eligible for capital improvement grants. That would typically occur after the airport master plan was completed.

One of the key elements of the airport master plans would be the precise determination of the area of the airfield to be requested transferred via PBC. FAA has noted that the area identified for a public-use airport should include not only the facilities necessary for anticipated aviation activity, but also any facilities and/or property that could generate revenue to support the airport financially.

At some former military bases, the golf course was transferred as part of the PBC for the airfield, and the revenue generated by the course was used to support the airport until it was financially self sufficient. The analysis in the Aviation Feasibility Study indicated that a civilian airport could operate efficiently with a single runway (the inboard runway – 1R-19L). Such a facility would encompass approximately 600 acres.

The BLRA could also request both parallel runways through PBC, which encompasses approximately 800 acres, and use the additional property for non-aviation purposes, if it so chose. A civilian airport could operate with a single runway, and some of the airfield facilities such as Hangar 6 and the associated ramp and/or possibly the outboard runway, could be used for non-aviation purposes. A number of additional steps will also be required before the airfield would be transferred from the Navy to a public agency.

Any changes in the Navy's deployment schedule could impact the timing of the transfer of the airfield property, either moving the transfer point closer or farther out (beyond 2011), which could impact the civilian reuse schedule. One final consideration is that if the BLRA decides to proceed with a civilian airport option, the Authority can market the base and complete all but the very last step, outlined above, but will not be legally committed to operating a civilian airport until the Navy transfers the property and the Authority signs the deed.