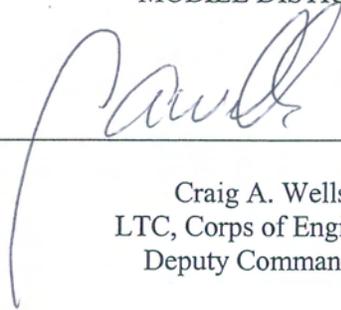


ENVIRONMENTAL ASSESSMENT

**IMPLEMENTATION OF BRAC ACTIONS AT
ROCK ISLAND ARSENAL, ROCK ISLAND, IL**

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT



Craig A. Wells
LTC, Corps of Engineers
Deputy Commander

Approved by:

ROCK ISLAND ARSENAL, IL



Alan G. Wilson
Garrison Manager
U.S. Army Garrison
Rock Island Arsenal

Final Environmental Assessment

Implementation of BRAC Actions at Rock Island Arsenal, Rock Island, Illinois

Prepared for
U.S. Army Corps of Engineers

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Executive Summary

ES-1 Introduction

As a result of actions mandated by the 2002 Base Closure and Realignment law (commonly referred to as BRAC), Fort Gillem, Georgia, will be closed and the Headquarters of the 1st U.S. Army will be relocated to Rock Island Arsenal (RIA), Illinois. The Riverbank Army Ammunition Plant (AAP) in California will be closed and the artillery cartridge case metal parts functions will be relocated to RIA. Lastly, the Mississippi AAP in Mississippi will be closed and the 155MM Improved Conventional Munition (ICM) artillery metal parts functions will be relocated to RIA.

The purpose of and need for the proposed action is to enhance the ability of RIA to fulfill its military mission by providing the capabilities to support modern national defense requirements and to meet the cost-saving requirements of BRAC. The proposed action supports the Army's need to comply with the BRAC law and carries out the 2005 BRAC Commission's (Commission's) recommendations.

ES-2 Description of Proposed Action and Alternatives

Proposed Action (Remodel Alternative)

RIA proposes to remodel Building 68 to accommodate the relocation of the Headquarters of the 1st U.S. Army from Fort Gillem, Georgia, and to remodel a portion of Building 299 to accommodate the relocation of munitions functions from Riverbank AAP and Mississippi AAP.

The 1st U.S. Army would occupy approximately 2½ floors of Building 68. Significant structural modifications to the building would not be needed, based on RIA engineering estimates. Under this alternative, remodeling of Building 68 would include modifications to the interior layout to provide an Emergency Operations/Joint Operations Center (EOC/JOC), a command suite for General Officers, and up to five video teleconference rooms. The EOC/JOC would be equipped with an emergency generator and an uninterruptible power supply (UPS). Modifications would include upgrades to meet current force protection and anti-terrorism standards such as replacing windows and doors, as well as installing perimeter barriers and landscaping to meet the required set-back distances from roadways and parking.

The remodeling of Building 299 under this alternative would involve modifications to the interior of the southwestern part of the building to provide space for the incoming munitions storage and production functions. The most significant structural modification that would be made would be raising one of the high bays approximately 20 feet to accommodate the equipment from Riverbank AAP. Other modifications would include constructing shop offices, restrooms, locker rooms, and shower facilities; modifying loading dock facilities; providing utilities including electrical, steam, cooling water, compressed air,

nitrogen, and natural gas to process equipment; and upgrading lighting, insulation, and heating, ventilation, and air conditioning (HVAC) systems.

Alternatives Not Carried Forward

Relocate 1st U.S. Army Headquarters to Building 390

RIA considered the alternative of relocating the 1st US Army Headquarters to Building 390 at RIA. Although Building 390 has EOC facilities, relocating the 1st U.S. Army into this building would necessitate relocating some of the existing occupants into other buildings. The disruption and cost of relocating the existing occupants into other buildings were considered to be significant drawbacks by RIA planners. The potential for delaying the relocation of the 1st U.S. Army was also a major concern due to the large number of existing occupants that would require relocation and the preparations that would be required at the buildings into which they would be relocated. For these reasons, this alternative was eliminated from further study in this Environmental Assessment (EA).

Relocate Munitions Functions to Buildings other than Building 299

Several buildings at RIA were evaluated for their suitability to accommodate the incoming munitions functions from Riverbank AAP and Mississippi AAP. Numerous criteria, including floor space, ceiling height, ceiling clear span, and cost, were used in the alternatives analysis. Building 299 was determined to be the only building that can accommodate the floor space requirements for the combined munitions functions from Riverbank AAP and Mississippi AAP. Building 299 was also determined to be the only building that met the ceiling requirements for the incoming munitions functions. Lastly, Building 299 was ranked first among the buildings evaluated based on several cost criteria. Based on the overall alternatives analysis conducted by RIA, Building 299 was determined to be the only building suitable for accommodating the incoming munitions functions. For these reasons, this alternative was eliminated from further study in this EA.

No Action Alternative

The National Environmental Policy Act (NEPA) requires consideration of a no action alternative to the proposed action. Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army Headquarters or the munitions functions, as described in the 2005 BRAC Commission's recommendation presented in Section 2.1. The no action alternative is evaluated in detail in this EA to serve as a benchmark for the evaluation of the potential effects of the proposed federal action.

ES-3 Environmental Consequences

Proposed Action

Under the proposed action, there would be no significant changes to the human or natural environment (Table ES-1). Any impacts that the proposed action may have on the natural environment would be temporary and negligible. During the proposed renovation of Buildings 68 and 299, there would be *de minimus* increases in air emissions from fugitive

dust and construction vehicle exhaust emissions. The air emissions that would be generated by the production of artillery cartridge case metal parts being relocated from Riverbank AAP would cause *de minimus* impacts to air quality and are not expected to collectively exceed the federal air quality thresholds. Construction-related noise would be temporary and the levels are expected to be negligible or not audible off post. Remodeling of the buildings would have minor impacts on topography and soils during construction. The soils around the buildings are already disturbed and no significant land contouring would be required. Sediment and erosion controls would be implemented during construction to prevent any indirect impacts to surrounding soils or surface waters. Construction activity that occurs on the building exteriors may have a minor, temporary impact on vegetation, which consists entirely of mowed grass and sparse landscaping vegetation. After construction is completed, any affected areas would be restored to the original vegetative conditions. The establishment and operation of staging areas for the remodeling, as well as general construction noise, may temporarily disturb common wildlife species. The immediate areas around the buildings provide poor quality wildlife habitat because they are mostly developed. Any disturbance experienced by wildlife would be limited to the construction period and is expected to be minimal.

The remodeling of Buildings 68 and 299 would not have a significant impact on the structural integrities of the buildings and would not diminish the historic value of the structures. The increase in personnel-related traffic from relocation of personnel would not be significant and would be easily be accommodated by the existing transportation system of the installation. The increase in truck traffic to and from Building 299 associated with the incoming munitions functions is not expected to create a significant burden on the installation road system because it would be intermittent and traffic could be rerouted to other parts of the road system as needed. The increase in construction-related traffic would be temporary and would return to current levels when remodeling is completed. All hazardous waste generated by the production process would be handled, stored, and disposed in accordance with all applicable environmental regulations and with all hazardous materials management plans implemented at RIA. As part of the proposed action, RIA would install a treatment system in Building 299 for the hexchrome (hexavalent chromium) waste that would be generated by the production of artillery cartridge case metal parts. Generated wastewater would be monitored for compliance with the installation's Wastewater Discharge Permit. The asbestos abatement necessary for the remodeling of Building 299 would be conducted in accordance with the National Emission Standards for Hazardous Air Pollutants (NESHAP) and all other applicable state and federal regulations.

The remodeling and operation of the buildings would have little potential to interact with any past, present, or reasonably foreseeable future actions at or outside RIA. Personnel relocations associated with the proposed action would increase the population in the region of influence (ROI); however, the population increase would represent a negligible proportion of the baseline population. Increases in resident population and demand for public services would be more than offset by other BRAC and non-BRAC actions that are projected to result in a decrease in population and public service demand in the ROI. When coupled with other BRAC and non-BRAC actions, the proposed action would not permanently increase traffic at RIA or increase potable water consumption or wastewater and solid waste generation at the installation. The proposed action would have some minor

positive effects on the local economy resulting from short-term, temporary increases in employment and expenditures during construction.

No Action Alternative

The no action alternative would not result in any significant impacts to the resources evaluated in this EA. However, without remodeling its facilities, RIA would not be able to sufficiently comply with the 2005 BRAC Commission's recommendations. The inability of RIA to accommodate the 1st U.S. Army or incoming munitions functions has the potential to negatively affect other functions at RIA and to result in adverse cumulative impacts on the overall mission of the installation and that of the U.S. Army.

ES-4 Conclusions

Based on the findings of this EA, the proposed action would not result in significant adverse direct, indirect, or cumulative impacts to any environmental, cultural, physical, or socioeconomic resource. No mitigation measures have been determined to be necessary. Therefore, an Environmental Impact Statement will not be prepared and a Finding of No Significant Impact (FNSI) is warranted for the proposed action.

TABLE ES-1
 Summary of Potential Environmental and Socioeconomic Consequences
EA for Implementation of BRAC Actions at Rock Island Arsenal

Resource	Environmental and Socioeconomic Consequences	
	No Action	Proposed Action
Land Use	No Effect	No Effect
Air Quality	No Effect	Negligible Impact <i>de minimus</i> construction-related fugitive dust and construction vehicle exhaust emissions would be controlled through appropriate BMPs. Air emissions from production of artillery cartridge case metal parts would cause <i>de minimus</i> impacts to air quality and are not expected to collectively exceed federal air quality thresholds.
Noise	No effect	Negligible Impact Construction-related noise would be temporary and the levels are expected to be negligible or not audible off post. Operation of renovated buildings would generate noise levels similar to those currently generated.
Geology and Soils		
Geology	No Effect	No Effect
Topography	No Effect	Negligible Impact Minor topographic alternation during construction. Significant land contouring would not be conducted.
Soils	No Effect	Negligible Impact Minor construction-related disturbance. Soils around the buildings are already disturbed. Sediment and erosion controls would be implemented during construction to prevent any indirect impacts to surrounding soils.
Prime Farmland	No Effect	No Effect

TABLE ES-1
 Summary of Potential Environmental and Socioeconomic Consequences
EA for Implementation of BRAC Actions at Rock Island Arsenal

Resource	Environmental and Socioeconomic Consequences	
	No Action	Proposed Action
Water Resources		
Surface Water	No Effect	Negligible Impact Sediment and erosion controls would be implemented during construction to prevent any indirect impacts to surrounding surface waters. Such controls may include silt fences, hay bales, and seeding of cleared areas that are to remain exposed for long periods of time.
Groundwater	No Effect	Negligible Impact Little or no groundwater dewatering is expected to be required during construction activities.
Floodplains	No Effect	No Effect
Wetlands	No Effect	No Effect
Biological Resources		
Vegetation	No Effect	Negligible Impact Minor, temporary impact from construction activity on building exteriors. Vegetation consists entirely of mowed grass and sparse landscaping vegetation. After construction is completed, any affected areas would be restored to original vegetative conditions.
Wildlife	No Effect	Negligible Impact Minor, temporary disturbance from staging areas and construction noise. The immediate areas around the buildings provide poor quality wildlife habitat because of they are mostly developed. Any disturbance would be limited to the construction period and is expected to be minimal.

TABLE ES-1
 Summary of Potential Environmental and Socioeconomic Consequences
EA for Implementation of BRAC Actions at Rock Island Arsenal

Resource	Environmental and Socioeconomic Consequences	
	No Action	Proposed Action
Sensitive Species	No Effect	No Effect
Migratory Birds	No Effect	No Effect
Cultural Resources	No Effect	Negligible Impact Remodeling would not have a significant impact on the structural integrities of the buildings and would not diminish the historic value of the structures. All work would be confined to existing building footprints or previously disturbed areas so archaeological or Native American resources would not be impacted.
Socioeconomics		
Economic Development	No Effect	Negligible Impact Short-term, positive impact on local economy from temporary increases in employment and expenditures during construction.
Demographics and Public Services	No Effect	Negligible Impact Small population increase resulting from personnel relocations. Population increase would represent a negligible proportion of baseline population within the ROI. . Increases in resident population and demand for public services would be more than offset by other BRAC and non-BRAC actions that are projected to result in a decrease in population and public service demand in the ROI.
Environmental Justice and Protection of Children	No Effect	No Effect

TABLE ES-1
 Summary of Potential Environmental and Socioeconomic Consequences
EA for Implementation of BRAC Actions at Rock Island Arsenal

Resource	Environmental and Socioeconomic Consequences	
	No Action	Proposed Action
Transportation	No Effect	<p>Negligible Impact</p> <p>Increase in personnel-related traffic from relocation of personnel would not be significant and would be easily be accommodated by the existing transportation system of the installation. Increase in truck traffic to and from Building 299 associated with the incoming munitions functions is not expected to create a significant burden on the installation road system because it would be intermittent and traffic could be rerouted to other parts of the road system as needed. Increase in construction-related traffic would be temporary and would return to current levels when remodeling is completed.</p>
Utilities	No Effect	<p>Negligible Impact</p> <p>Minor modifications to the utility infrastructure of the installation. Small increase in energy demand would not overburden the utility system. When coupled with other BRAC and non-BRAC actions, proposed action would not increase potable water consumption or wastewater and solid waste generation at the installation.</p>
Hazardous and Toxic Substances	No Effect	<p>Negligible Impact</p> <p>All hazardous waste generated by the production process would be handled, stored, and disposed in accordance with all applicable environmental regulations and with all hazardous materials management plans implemented at RIA. As part of the proposed action, RIA would install a treatment system in Building 299 for hexchrome waste that would be generated by the production of artillery cartridge case metal parts. Generated wastewater would be monitored for compliance with the installation's Wastewater Discharge Permit. Asbestos abatement necessary for the remodeling of Building 299 would be conducted in accordance with NESHAP and all other applicable state and federal regulations.</p>

TABLE ES-1
 Summary of Potential Environmental and Socioeconomic Consequences
EA for Implementation of BRAC Actions at Rock Island Arsenal

Resource	Environmental and Socioeconomic Consequences	
	No Action	Proposed Action
Cumulative Effects	Negative Impact Without remodeling its facilities, RIA would not be able to sufficiently comply with the 2005 BRAC Commission's recommendations. The inability of RIA to accommodate the 1st U.S. Army or incoming munitions functions has the potential to negatively affect other functions at RIA and result in adverse cumulative impacts on the overall mission of the installation and that of the U.S. Army.	Positive Impact Proposed Action would have very little potential to interact with any past, present, or reasonably foreseeable future actions at or outside RIA. Short-term, positive cumulative impact on local economy from temporary increases in employment and expenditures during construction. Because the proposed action would allow RIA to better accommodate the incoming munitions functions, it would have a positive cumulative effect on the mission of RIA and that of the U.S. Army.

Notes:

BMP = best management practice

ROI = region of influence

RIA = Rock Island Arsenal

BRAC = Base Realignment and Closure

NESHAP = National Emission Standards for Hazardous Air Pollutants

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1. Purpose, Need, and Scope

1.1 Introduction

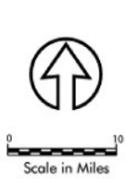
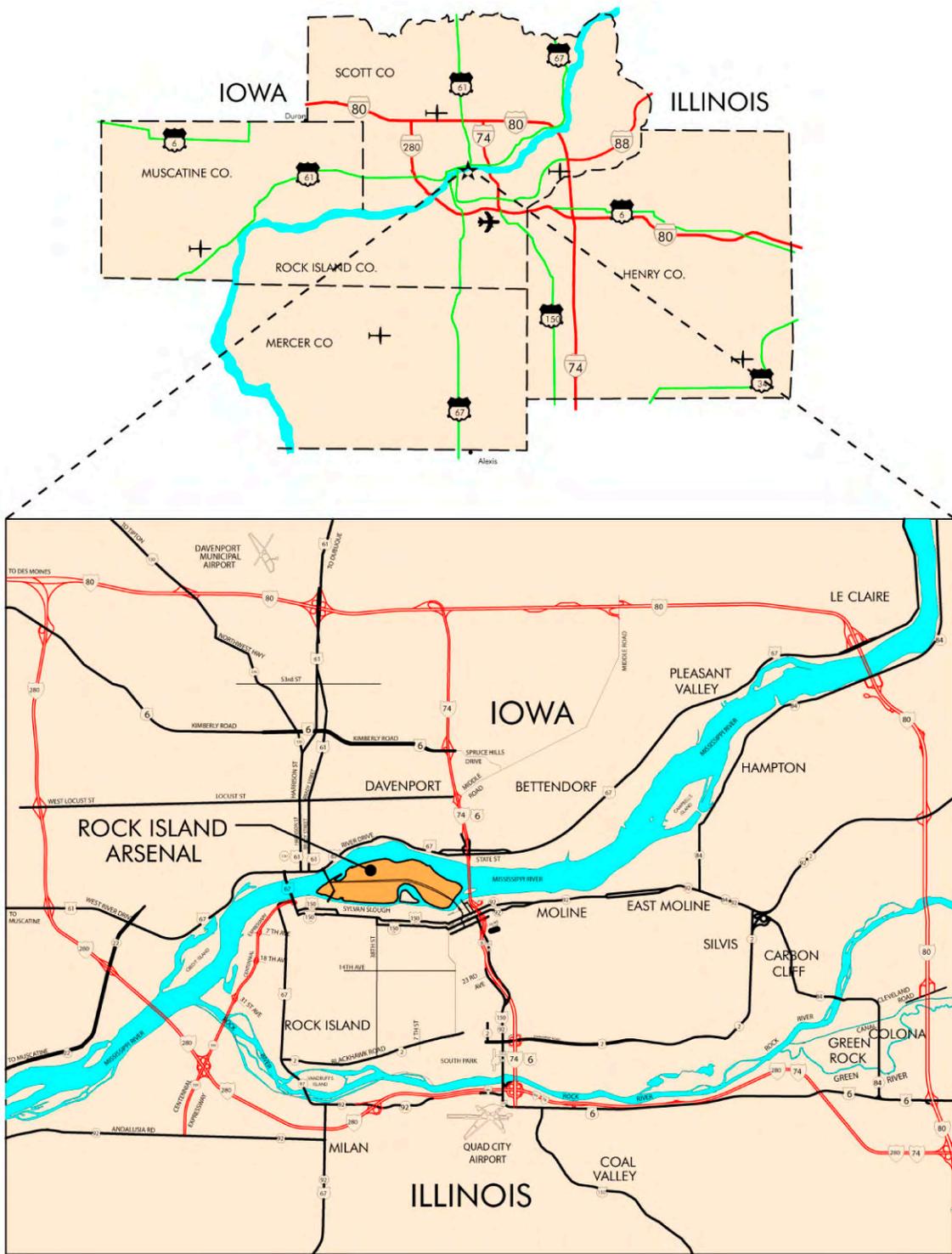
As a result of actions mandated by the 2002 Base Closure and Realignment law (commonly referred to as BRAC), Fort Gillem, Georgia, will be closed and the Headquarters of the 1st U.S. Army will be relocated to Rock Island Arsenal (RIA), Illinois. The Riverbank Army Ammunition Plant (AAP) in California will be closed and the artillery cartridge case metal parts functions will be relocated to RIA. Lastly, the Mississippi AAP in Mississippi will be closed and the 155MM Improved Conventional Munition (ICM) artillery metal parts functions will be relocated to RIA.

1.2 Purpose of and Need for Proposed Action

The purpose of and need for the proposed action is to enhance the ability of RIA to fulfill its military mission by providing the capabilities to support modern national defense requirements and to meet the cost-saving requirements of BRAC. The proposed action supports the Army's need to comply with the BRAC law and carries out the 2005 BRAC Commission's (Commission's) recommendations. Details of the proposed action are provided in Sections 2.1 and 3.1.

1.3 Scope of Analysis

This Environmental Assessment (EA) has been developed in accordance with the National Environmental Policy Act (NEPA), NEPA implementing regulations found in *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*, 40 Code of Federal Regulations (CFR) Part 1500 through Part 1508 (President's Council on Environmental Quality [CEQ], 2002), and *Environmental Analysis of Army Actions*, 32 CFR 651.14 (Office of the Deputy Assistant Secretary of the Army, 2002). This EA was developed to identify the environmental and socioeconomic impacts of relocating the Headquarters of the 1st U.S. Army and munitions functions to support realignment. Its purpose is to inform decision makers and the public of the likely consequences of the proposed action and alternatives. RIA is an active U.S. Army installation that has the primary mission of supporting national defense requirements through munitions production, storage, destruction, and testing. RIA is located on an island in the Mississippi River along the border of Iowa and Illinois (Figure 1-1).



- Legend**
- Interstate
 - U.S. Highway
 - Cities
 - Local Service
 - Scheduled Commercial Service

FIGURE 1-1
VICINITY MAP
 EA FOR IMPLEMENTATION OF BRAC
 ACTIONS AT ROCK ISLAND ARSENAL

BRAC specifies that in applying the provisions of NEPA to the process, the Secretary of Defense and the secretaries of the military departments concerned do not have to consider (i) the need for closing or realigning the military installations which have been recommended for closure or realignment by the Commission, (ii) the need for transferring functions to any military installation which has been selected as the receiving installation, or (iii) military installations alternative to those recommended or selected. The Commission's deliberation and decision, as well as the need for closing or realigning a military installation, are exempt from NEPA. Accordingly, this EA does not address the need for closure or realignment. This EA identifies, documents, and evaluates the effects of relocating the Headquarters of the 1st U.S. Army, as well as artillery cartridge case metal parts functions and 155MM ICM artillery metal parts functions to RIA. Potential impacts resulting from building modifications and operations proposed to accommodate the 1st U.S. Army and incoming munitions functions are considered in this EA. This EA also considers how the proposed action may interact with present and reasonably foreseeable actions that are not directly related to the proposed action. This EA evaluates the socioeconomic impacts of personnel relocations for the 1st U.S. Army, but does not cover housing requirements. Separate NEPA documentation will be prepared for the housing requirements of the 1st U.S. Army after the preliminary evaluations are completed.

1.4 Agency and Public Participation

The Army invites public participation in the evaluation of the proposed federal action through the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision-making. All agencies, organizations, and members of the public having a potential interest in the proposed action, including minority, low-income, disadvantaged, and Native American groups, are urged to participate in the decision-making process. Initial agency scoping letters have been submitted to regulatory agencies including the U. S. Fish and Wildlife Service (USFWS) and the Illinois State Historic Preservation Office (SHPO).

Public participation opportunities with respect to this EA and decision making on the proposed action are guided by 32 CFR Part 651. The EA and draft Finding of No Significant Impact (FNSI) underwent a 30-day public review during 13 April - 12 May 2007. The public review period was announced in public notices that were published in the *Quad City Times* newspaper out of Davenport, Iowa and the *Moline Dispatch* newspaper out of Moline, Illinois (Appendix B). Copies of the EA and draft FNSI were made available for public review during the review period on the BRAC website http://www.hqda.army.mil/acsim/brac/env_ea_review.htm, and at Davenport Public Library in Davenport, Iowa and at Moline Public Library in Moline, Illinois. All questions or comments were directed to Mr. Chuck Swynenberg, Environmental Coordinator, 1 Rock Island Arsenal, Building 102, Rock Island, Illinois 61299-5000. (309) 782-2445. charles.lee.swynenberg@us.army.mil. No comments were received during the public review period.

1.5 Relevant Statutes and Executive Orders

The decision on whether to proceed with the proposed action rests on numerous factors such as

mission requirements, schedule, availability of funding, and environmental considerations. In addressing environmental considerations, RIA is guided by relevant statutes (and their implementing regulations) and Executive Orders (EOs) that establish standards and provide guidance on environmental and natural resources management and planning. These include the Clean Air Act, Clean Water Act (CWA), Noise Control Act, Endangered Species Act, National Historic Preservation Act, Archaeological Resources Protection Act, Resource Conservation and Recovery Act (RCRA), and Toxic Substances Control Act. EOs bearing on the proposed action include EO 11988 (*Floodplain Management*), EO 11990 (*Protection of Wetlands*), EO 12088 (*Federal Compliance with Pollution Control Standards*), EO 12580 (*Superfund Implementation*), EO 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*), EO 13045 (*Protection of Children from Environmental Health Risks and Safety Risks*), EO 13175 (*Consultation and Coordination with Indian Tribal Governments*), EO 13186 (*Responsibilities of Federal Agencies to Protect Migratory Birds*), and EO 13423 (*Strengthening Federal Environmental, Energy, and Transportation Management*). These authorities are addressed in various sections throughout this EA when relevant to particular environmental resources and conditions. The full text of the laws, regulations, and EOs is available on the Defense Environmental Network & Information Exchange Web site at <http://www.denix.osd.mil>.

The National Defense Authorization Act for Fiscal Year 2002 Public Law 107-107 and the Defense Closure and Realignment Act of 1990, Public Law 101-510, include streamlining provisions that modify the scope of NEPA analysis by placing certain limits on what is analyzed.

1.6 Impact Analysis Performed

This EA identifies, documents, and evaluates the effect of implementing BRAC actions at RIA. An interdisciplinary team of environmental scientists, biologists, planners, economists, engineers, archaeologists, historians, and military technicians has analyzed the proposed action and alternatives in consideration of existing conditions and has identified relevant beneficial and adverse effects associated with the action. The proposed action is described in Section 2, while other alternatives including the no action alternative, are described in Section 3. Existing conditions, considered to be the “baseline” conditions, are described in Section 4. The expected effects of the proposed action are presented in Section 4 immediately following the description of baseline conditions for each resource covered by the EA. Section 4 also addresses the potential for cumulative effects, and identifies mitigation measures where appropriate. Section 5 presents the conclusions of the analyses.

2. Description of the Proposed Action

2.1 Introduction

The proposed action is to implement the Commission's recommendations as mandated by the BRAC legislation, Public Laws 101-510 and 107-107. The Commission's recommendations pertaining to RIA are to:

Close Fort Gillem, GA. Relocate the Headquarters, 1st U.S. Army to RIA, IL. Close Riverbank AAP, CA. Relocate the artillery cartridge case metal parts functions to RIA, IL. Close Mississippi AAP, MS. Relocate the 155MM ICM artillery metal parts functions to RIA, IL.

2.2 Proposal Implementation

Components of the proposed action for this EA include remodeling existing facilities at RIA to accommodate the relocation of the Headquarters of the 1st U.S. Army from Fort Gillem, Georgia, and the munitions functions from Riverbank AAP and Mississippi AAP to RIA. The relocation of the 1st U.S. Army Headquarters would add approximately 150 civilian employees and 280 military personnel to RIA. The incoming munitions functions would not involve any personnel relocations. Additional hires are not expected to be required to accommodate the incoming munitions functions.

3. Alternatives

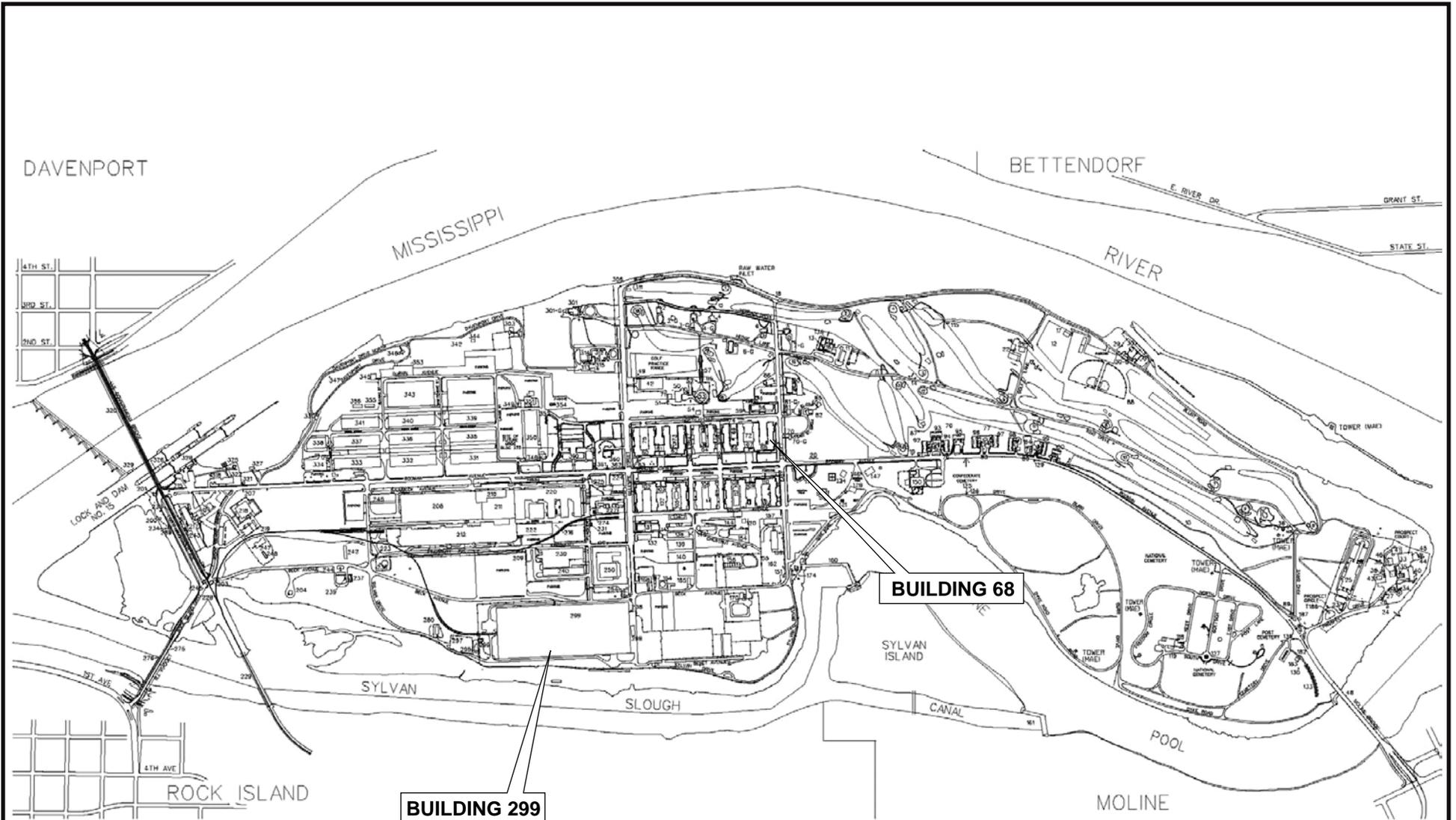
This section presents the Army's development of alternatives and addresses alternatives available for the proposed action. This section also defines the no action alternative of maintaining existing conditions. NEPA requires consideration of alternatives to the proposed action. To warrant detailed evaluation, an alternative must be reasonable. Reasonable alternatives must be reasonably foreseeable and adequately defined for decision-making (any necessary preceding events having taken place), affordable, capable of implementation, and capable of meeting the purpose of and need for the action. The following discussion identifies alternatives considered by the Army and determines whether they are reasonable and subject to detailed evaluation in this EA.

3.1 Remodel Alternative (Preferred Alternative)

Under this alternative, Building 68 would be remodeled to accommodate the relocation of the Headquarters of the 1st U.S. Army from Fort Gillem, Georgia, and a portion of Building 299 would be remodeled to accommodate the relocation of munitions functions from Riverbank AAP and Mississippi AAP. The locations of Buildings 68 and 299 are shown in Figure 3-1.

The 1st U.S. Army would occupy approximately 2½ floors of Building 68. Significant structural modifications to the building would not be needed, based on RIA engineering estimates. Under this alternative, remodeling of Building 68 would include modifications to the interior layout to provide an Emergency Operations/Joint Operations Center (EOC/JOC), a command suite for General Officers, and up to five video teleconference rooms. The EOC/JOC would be equipped with an emergency generator and an uninterruptible power supply (UPS). Modifications would include upgrades to meet current force protection and anti-terrorism standards such as replacing windows and doors, as well as installing perimeter barriers and landscaping, to meet the required set-back distances from roadways and parking.

The remodeling of Building 299 under this alternative would involve modifications to a portion of the building interior to provide space for the incoming munitions storage and production functions. The most significant structural modification that would be made would be raising one of the high bays approximately 20 feet to accommodate the equipment from Riverbank AAP. Other modifications would include constructing shop offices, restrooms, locker rooms, and shower facilities; modifying loading dock facilities; providing utilities including electrical, steam, cooling water, compressed air, nitrogen, and natural gas to process equipment; and upgrading lighting and heating, ventilation, and air conditioning (HVAC) systems.



FEBRUARY 2006



FIGURE 3-1
PROJECT LOCATION MAP
 EA FOR IMPLEMENTATION OF BRAC
 ACTIONS AT ROCK ISLAND ARSENAL

3.2 Alternatives Considered but Eliminated from Further Study

Potential alternatives that were considered but eliminated from further study are discussed in the following subsections. Each potential alternative was evaluated in terms of its ability to meet the project needs and its potential impacts.

Relocate 1st U.S. Army Headquarters to Building 390

RIA considered the alternative of relocating the 1st U.S. Army Headquarters to Building 390 at RIA. Although Building 390 has EOC facilities, relocating the 1st U.S. Army into this building would necessitate relocating some of the existing occupants into other buildings. The disruption and cost of relocating the existing occupants into other buildings were considered to be significant drawbacks by RIA planners. The potential for delaying the relocation of the 1st U.S. Army was also a major concern due to the large number of existing occupants that would require relocation and the preparations that would be required at the buildings into which they would be relocated. For these reasons, this alternative was eliminated from further study in this EA.

Relocate Munitions Functions to Buildings other than Building 299

Several buildings at RIA were evaluated for their suitability to accommodate the incoming munitions functions from Riverbank AAP and Mississippi AAP. Numerous criteria, including floor space, ceiling height, ceiling clear span, and cost, were used in the alternatives analysis. As shown in Table 3-1, Building 299 is the only building that can accommodate the floor space requirements for the combined munitions functions from Riverbank AAP and Mississippi AAP. As shown in Table 3-2, Building 299 is also the only building that met the ceiling requirements for the incoming munitions functions. Lastly, Building 299 was ranked first among the buildings evaluated based on several cost criteria. Based on the overall alternatives analysis conducted by RIA, Building 299 was determined to be the only building suitable for accommodating the incoming munitions functions. For these reasons, this alternative was eliminated from further study in this EA.

3.3 No Action Alternative

NEPA requires consideration of a no action alternative to the proposed action. Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army Headquarters or the munitions functions, as described in the Commission's recommendation, presented in Section 2.1. Inclusion of the no action alternative serves as a benchmark for the evaluation of the potential effects of the proposed federal action. The no action alternative is evaluated in detail in this EA.

TABLE 3-1
 Floor Space Matrix
EA for Implementation of BRAC Actions at Rock Island Arsenal

Building	Total Ground Floor Area (SF)	Availability of Non Ground Floor Area	Can Accommodate Riverbank AAP Floor Space Requirements ^a	Can Accommodate Mississippi AAP Floor Space Requirements ^b	Can Accommodate Combined Floor Space Requirements
# 64	43,485	No	No	No	No
# 106	46,250	No	No	No	No
# 64 and 106	89,735	No	No	No	No
# 220	96,737	Yes	Close	No	No
# 250	134,564	Yes	Yes	Yes	No
# 299	290,672	No	Yes	Yes	Yes
# 343	131,146	No	Yes	Yes	No

Notes:

^a Floor space required for Riverbank AAP functions: 102,400 SF

^b Floor space required for Mississippi AAP functions: 126,275 SF

SF = square feet

TABLE 3-2
 Ceiling Characteristics Matrix
EA for Implementation of BRAC Actions at Rock Island Arsenal

Potential Location	Can Accommodate Riverbank AAP Ceiling Requirements	Can Accommodate Mississippi AAP Ceiling Requirements
# 220	No	No
# 250	No	No
# 299	Yes	Yes
# 343	No	No

Notes:

Evaluation based on ceiling height and clear span

AAP = Army Ammunition Plant

4. Environmental Conditions and Consequences

4.1 Introduction

This section describes the existing environmental and socioeconomic conditions potentially affected by the proposed action, as well as the potential environmental and socioeconomic impacts of implementing the proposed action or alternatives. This section provides information to serve as a baseline from which to identify and evaluate environmental and socioeconomic changes likely to result from the implementation of the proposed action. Baseline conditions represent current conditions. In compliance with NEPA, CEQ guidelines, and 32 CFR Part 651, et seq., the description of the affected environment focuses on those resources and conditions potentially subject to impacts.

Subsequent to the description of the components of the affected environment, this section presents the analysis of the direct, indirect, and cumulative environmental and socioeconomic effects that would likely occur with the proposed action or no action alternative and identifies any adverse environmental effects that cannot be avoided through project design.

Direct versus Indirect Effects

The terms “effect” and “impact” are synonymous as used in this EA. Effects may be beneficial or adverse and may apply to the full range of natural, aesthetic, historic, cultural, and economic resources within the project area and also within the surrounding area. Definitions and examples of direct and indirect impacts, as used in this document, are as follows:

- **Direct Impact.** A direct impact is one that would be caused directly by implementing an alternative and that would occur at the same time and place.
- **Indirect Impact.** An indirect impact is one that would be caused by implementing an alternative that would occur later in time or farther removed in distance, but that would still be a reasonably foreseeable outcome of the action. Indirect impacts may include induced changes in the pattern of land use, population density, or growth rate, and indirect effects to air, water, and other natural resources and social systems.
- **Relationship between Direct versus Indirect Impacts.** For direct impacts to occur, a resource must be present. For example, if highly erodible soils were disturbed as a direct result of the use of heavy equipment during construction of a home, there could be a direct effect on soils resulting from erosion. This could indirectly affect water quality if stormwater runoff containing sediment from the construction site were to enter a stream.

Short-term versus Long-term Effects

Effects are also expressed in terms of duration. The duration of short-term impacts is considered to be 1 year or less. For example, the construction of a building would likely expose soil in the immediate area of construction. However, this effect would be considered short-term because it would be expected that vegetation would reestablish on the disturbed area within a year of the disturbance. Long-term impacts are described as lasting beyond 1 year. Long-term impacts can potentially continue in perpetuity, in which case they would also be described as permanent.

Intensity of Effects

The magnitude of effects of an action must be considered regardless of whether the effects are adverse or beneficial. The following terms are used to describe the magnitude of impacts:

- No Impact: The action does not cause a detectable change.
- Negligible: The impact is at the lowest level of detection.
- Minor: The impact is slight but detectable.
- Moderate: The impact is readily apparent.
- Major: The impact is severely adverse or exceptionally beneficial.

Significance

In accordance with CEQ regulations and implementing guidance, impacts are also evaluated in terms of whether they are significant. Both short-term and long-term effects are relevant to the consideration of significance. Significant, as defined in the CEQ regulations for implementing NEPA at 40 CFR 1508.27, requires consideration of context and intensity.

Context requires that significance may be considered with regard to society, the affected region, affected interests, and the locality. The scale of consideration for context varies with the setting and magnitude of the action. A small, site-specific action is best evaluated relative to the location than to the entire world.

Cumulative Effects

The most severe environmental degradation may not result from the direct effects of any particular action, but from the combination of effects of multiple, independent actions over time. As defined in 40 CFR 1508.7 (CEQ Regulations), a cumulative effect is the:

“impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.”

Some authorities contend that most environmental effects can be seen as cumulative because almost all systems have already been modified. Principles of cumulative effects

analysis are described in the CEQ guide, *Considering Cumulative Effects under the National Environmental Policy Act* (2006). CEQ guidance on cumulative impacts analysis states:

“For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited through scoping to effects that can be evaluated meaningfully. The boundaries for evaluating cumulative effects should be expanded to the point at which the resource is no longer affected significantly or the effects are no longer of interest to affected parties.” (CEQ, 2006)

Mitigation

The alternatives considered in this EA could have environmental and socioeconomic impacts resulting from implementation that would require mitigation. Should potentially significant adverse impacts be identified, measures that could be used to mitigate them would be discussed. Potential mitigation actions could include the following:

- Rectifying an impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating an impact over time by preservation and maintenance operations during the life of the action.
- Compensating for an impact by replacing or providing substitute resources or environments.

Where no significant adverse impacts are identified, mitigation measures would not be required or proposed.

4.2 Land Use

4.2.1 Affected Environment

4.2.1.1 Regional Geographic Setting and Location

RIA is located on Arsenal Island in Rock Island County, Illinois (see Figure 1-1). Arsenal Island is located in the Mississippi River, which in the area, represents the border of Iowa and Illinois. RIA owns 866.5 acres of Arsenal Island, which is 987 acres in total size. Surrounding major cities include the cities of Davenport and Bettendorf, Iowa, to the north and the cities of Moline and Rock Island, Illinois, to the south. The area encompassed by these cities is referred to as the Quad Cities.

4.2.1.2 Installation Land/Air Space Use

The existing land uses at RIA are described in the 2006 RIA *Real Property Master Plan*. Most of the Arsenal property is classified as Open Space (23 percent) and Outdoor Recreation (22 percent). Administration, Industrial, and Supply/Storage/Maintenance land uses comprise more than one third of the total area and are located mostly in the western half of the island. These uses are associated with RIA’s manufacturing and administrative/logistics missions. The remaining land uses at RIA are Housing, Training, Cemetery, and Community Facilities. RIA does not have any aviation-based land use. The land use

classification of Building 68 is Administration and the land use classification of Building 299 is Supply/Storage/Maintenance.

4.2.1.3 Surrounding Land Use

The Quad Cities metropolitan area consists primarily of residential, commercial, and industrial land uses. The riverfront areas adjacent to RIA are fully developed and are designated primarily for industrial and recreational uses in Rock Island and Moline, Illinois, and for commercial, industrial, and recreational uses in Davenport and Bettendorf, Iowa.

Current and Future Development in the Region of Influence

Each of the Quad Cities communities along the Mississippi River is currently undertaking major development projects to revitalize its downtown riverfront areas. Current and future development includes renovation of dilapidated properties and new construction to create housing, office space, and tourism areas. The development of the Great River Trail, which is an interconnected greenway system along the Mississippi River in the Quad Cities area, has been underway for the last decade. When completed, the Great River Trail, would be a continuous, 60-mile, multi-purpose, recreation path consisting of several interconnected trail systems.

4.2.2 Consequences

4.2.2.1 Proposed Action

The land use classifications of Building 68 (Administration) and Building 299 (Supply/Storage/Maintenance) would not be changed by the proposed action. Under the proposed action, remodeling of these buildings would be contained within the existing footprints of the buildings. Adjacent land uses and land uses in the surrounding region would not be affected in any manner by the proposed action.

For these reasons, the proposed action would have no effect on land use.

4.2.2.2 No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. Therefore, the no action alternative would have no effect on land use.

4.3 Air Quality

4.3.1 Affected Environment

The Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. NAAQS include two types of air quality standards. Primary standards protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings

(EPA, 2005). EPA has established NAAQS for six principal pollutants, which are called criteria pollutants (Table 4-1).

TABLE 4-1
National Ambient Air Quality Standards
EA for Implementation of BRAC Actions at Rock Island Arsenal

Pollutant	Primary Standards	Averaging Times	Secondary Standards	
Carbon Monoxide	9 ppm (10 mg/m ³)	8-hour ¹	None	
	35 ppm (40 mg/m ³)	1-hour ¹	None	
Lead	1.5 µg/m ³	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m ³)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter	50 µg/m ³	Annual ² (Arithmetic Mean)	Same as Primary	
	PM ₁₀	150 µg/m ³	24-hour ¹	
	PM _{2.5}	15.0 µg/m ³	Annual ³ (Arithmetic Mean)	Same as Primary
		65 µg/m ³	24-hour ⁴	
Ozone	0.08 ppm	8-hour ⁵	Same as Primary	
Sulfur Oxides	0.03 ppm	Annual (Arithmetic Mean)		
	0.14 ppm	24-hour ¹		
		3-hour ¹	0.5 ppm (1,300 µg/m ³)	

Notes:

¹ Not to be exceeded more than once per year.

² 3-year average of the weighted annual mean PM₁₀ concentration at each monitor within an area must not exceed 50 µg/m³.

³ 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.

⁴ 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 µg/m³.

⁵ 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

ppm = parts per million

PM = particulate matter

µg/m³ = micrograms per cubic meter

Source: <http://www.epa.gov/air/criteria.html> (EPA, 2005)

Areas that do not meet the air quality standard for one of the criteria pollutants may be subject to the formal rule-making process and be designated as being in nonattainment for that standard.

RIA is located in an attainment area within the Mississippi Valley region. Based on air quality monitoring conducted by both Illinois and Iowa, the area has not experienced any exceedances of air quality standards. On 25 May, 2002, RIA was issued a Title V Clean Air Act Permit Program (CAAPP) Permit and a Title 1 Permit for operations of an Army manufacturing and warehousing facility (I.D. #161065AAW). As a part of the Title V Clean Air Act Permit regulations, RIA conducts an annual air emission inventory. Air emission

sources at RIA include the coal-fired central heat plant in Building 227, plating shop in Building 212, foundry operations in Building 212, surface-coating operations in Buildings 208 and 299, and automobile traffic.

4.3.2 Consequences

4.3.2.1 Proposed Action

The proposed remodeling of Buildings 68 and 299 would result in short-term, minor impacts to air quality. Fugitive dust (particulate matter) and construction vehicle exhaust emissions would be generated during construction and would vary daily, depending on the level and type of work conducted. Fugitive dust would be controlled at the sites using best management practices (BMPs). Vehicle exhaust emissions would be temporary, and at their expected generation levels, would not significantly affect air quality. Fugitive dust and exhaust emissions from the proposed construction activities would not collectively represent a new major source of air emission, and therefore, would not require a modification to the Title V permit under which RIA operates.

The 155 MM ICM artillery metal parts functions being relocated from Mississippi AAP involve only storage at RIA. The storage of these munitions at RIA would not generate any air emissions.

Some air emissions would be generated by the artillery cartridge case metal parts functions being relocated from Riverbank AAP. The expected production quantity for the incoming cartridge case metal parts functions is 5,000 parts per month. The heat treatment, salt-bath, and plating components of the production process would generate air emissions and would require modification to the Title V permit under which RIA operates. The various air emissions would be contained by hoods and removed by pollutant-specific air scrubbers. All other components of the production process are cold operations that would not generate any air emissions. Table 4-2 presents the total air emissions generated by the production of artillery cartridge case metal parts at Riverbank AAP in 2005.

TABLE 4-2

Total Air Emissions Generated by the Production of Artillery Cartridge Case Metal Parts at Riverbank AAP in 2005
EA for Implementation of BRAC Actions at Rock Island Arsenal

Permit Unit	Pollutant	Emission (lbs)
Cartridge Case Anneal Furnace and Pickle, Phosphate Soapcoat Unit Bldg. 50	NO ₂	1301.20
	CO	1093.01
	PM ₁₀	2634.93
	SO ₂	27.33
	VOC	70.26
Cartridge Case Heat Treat Furnace and Pickle, Phosphate Soapcoat Unit Bldg. 156	PM ₁₀	1706.84
Cartridge Case Zinc Plating Unit Bldg. 6	PM ₁₀	304.20
	Cr (VI)	0.02

TABLE 4-2

Total Air Emissions Generated by the Production of Artillery Cartridge Case Metal Parts at Riverbank AAP in 2005
EA for Implementation of BRAC Actions at Rock Island Arsenal

Permit Unit	Pollutant	Emission (lbs)
Cartridge Case 8.6-MMBTU/hr Clayton Boiler-South	NO ₂	27.29
	CO	40.93
	PM ₁₀	8.53
	SO ₂	2.39
	VOC	6.14
Cartridge Case 8.6-MMBTU/hr Clayton Boiler-North	NO ₂	27.17
	CO	40.76
	PM ₁₀	8.49
	SO ₂	2.38
	VOC	6.11

Notes:

lbs = pounds

CO = carbon monoxide

NO₂ = nitrogen dioxide

SO₂ = sulfur dioxide

PM₁₀ = particulate matter less than or equal to 10 microns in aerodynamic diameter

VOC = volatile organic compound

Cr (VI) = hexchrome (hexavalent chromium)

MMBTU/hr = million British thermal units

The air emissions that would be generated by artillery cartridge case metal parts functions being relocated from Riverbank AAP would cause *de minimus* impacts to air quality and are not expected to collectively exceed the thresholds set under 40 CFR §93.153.

For these reasons, the proposed action would result in minor impacts to air quality.

4.3.2.2 No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. RIA would continue to operate under its existing Title V permit. Therefore, the no action alternative would have no effect on air quality.

4.4 Noise

4.4.1 Affected Environment

For the determination of impacts to human receptors, noise measurements are weighted to increase the contribution of noises within the normal range of human hearing and to decrease the contribution of noises outside the normal range of human hearing. For

humans, this is considered an A-weighted scale (dBA). When sound pressure doubles, the dBA level increases by 3. Psychologically, most humans perceive a doubling of sound with an increase of 10 dBA (EPA, 1974; Danish Wind Industry Association, 2003). Sound pressure decreases with distance from the source. Typically, the amount of noise is halved as the distance from the source doubles (EPA, 1974; Danish Wind Industry Association, 2003).

The primary sources of noise at RIA include mechanical sources (e.g., fans, motors, compressors, and generators), vehicular traffic, sirens, and intermittent construction. RIA has a hearing conservation program that requires hearing protection in the presence of sources that emit noise levels greater than 85 decibels (dB). The RIA Steam Plant (Building 227) is the only source at RIA that generates noise that can be audible off post. However, no complaints have been received about the noise that is generated from this source. An Installation Compatibility Use Zone (ICUZ) study conducted at RIA in February 1989 concluded that little noise from RIA is audible off post. The study also noted that the noise generated at RIA has been at compatible with land use planning levels. An update to the study in November 1994 confirmed that noise levels at RIA had not changed since the initial study.

4.4.2 Consequences

4.4.2.1 Proposed Action

Most of the construction activity for the remodeling of Buildings 68 and 299 would occur within the interiors of the buildings. As such, most of the construction-related noise generated from the remodeling would not be audible to outside receptors. Construction activity that occurs on the building exteriors would be conducted during normal business hours. Construction-related noise would be temporary and the levels are expected to be negligible or not audible off post. After construction activities are completed, noise levels at RIA would be similar to those that currently occur.

The noise that would be generated by the production of artillery cartridge case metal parts in Building 299 is not expected to be audible to receptors outside the building. Workers would use hearing protection and would follow Occupational Safety and Health Administration (OSHA) standards and procedures.

For these reasons, any noise impacts from the proposed action would be temporary and minor.

4.4.2.2 No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. Therefore, the no action alternative would have no noise-related effects.

4.5 Geology and Soils

4.5.1 Affected Environment

4.5.1.1 Geologic and Topographic Conditions

RIA is located on the western edge of the Tills Plain section of the General Lowland Physiographic Province. The average depth of bedrock at RIA is 6 feet below land surface. The bedrock is limestone that was formed in the Devonian Age. It has irregular surfaces as a result of Pleistocene glaciation and erosion. The limestone bedrock is overlapped by weak shale and sandstone formed during the more recent Pennsylvanian Age.

RIA has a relatively flat to gently rolling terrain. Surface elevations range from a low of 551 feet above mean sea level (msl) at the edge of Sylvan Slough to a high of 594 feet above msl near the center of the island at Building 390. The surface elevation of the Mississippi River above Dam No. 15 and the Arsenal Power Dam is approximately 561 feet above msl. Below these dams, the river surface elevation is approximately 550 feet above msl.

4.5.1.2 Soils

Detailed information regarding the soils of RIA is presented in the RIA *Integrated Natural Resources Management Plan*, based on the Soil Conservation Service, Soil Survey of Rock Island County, Illinois (U.S. Department of Agriculture [USDA], 1977). Soils at RIA primarily consist of sandy loams and clays, both of which were deposited by the Mississippi River and by wind.

4.5.1.3 Prime Farmland

There is no prime farmland located on RIA. As a result, this resource is not further evaluated.

4.5.2 Consequences

4.5.2.1 Proposed Action

The proposed remodeling of Buildings 68 and 299 would not involve any intrusive construction activity that would affect the subsurface geological formations. The proposed action would have minor impacts on topography and soils during construction. The soils around the buildings are already disturbed and no significant land contouring would be required. Sediment and erosion controls would be implemented during construction to prevent any indirect impacts to surrounding soils or surface waters. Such controls may include silt fences, hay bales, and seeding of cleared areas that are to remain exposed for long periods of time.

For these reasons, the proposed action would have no effect on geology and a negligible impact on topography and soils.

4.5.2.2 No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. Therefore, the no action alternative would have no effect on geology, topography, soils, or prime farmland.

4.6 Water Resources

4.6.1 Affected Environment

4.6.1.1 Surface Water

RIA is located on Arsenal Island in the Mississippi River in the Copperas-Duck Watershed. The main tributary in this watershed is the Mississippi River, which has its headwaters in northern Minnesota and discharges into the Gulf of Mexico. The Mississippi River is the second longest river in the United States, with a total length of approximately 2,320 miles. Around RIA, the Mississippi River ranges from approximately ¼ mile wide to more than ½ mile wide on the northern side of the island. Sylvan Slough, on the southern side of the island, is approximately 600 feet wide. In general, the water quality of the Mississippi River and its tributaries is degraded. The stretch of the river near RIA does not meet the established standards for its designated uses under the CWA. As a result, this stretch of the river is listed on the CWA Section 303(d) list, and additional studies are required to treat water quality problems. There are no naturally occurring surface water features at RIA. The stormwater management system at RIA consists of man-made detention basins and drainage ditches. Storm water is also conveyed by curb and gutter systems.

Drinking water at RIA is provided via treated water from the Mississippi River. The water is treated onsite by the RIA Drinking Water Treatment Plant, which produces approximately 300,000 to 400,000 gallons of water per day. This water meets all of the EPA requirements for public water supply systems. Untreated water is also drawn from the Mississippi River for irrigation purposes at RIA, primarily to irrigate the RIA Golf Course.

4.6.1.2 Groundwater

Groundwater is defined as a subsurface water that has accumulated in the voids between soil particles and within porous bedrock. A water-bearing rock or rock formation is an aquifer. The water within an aquifer can migrate vertically and horizontally, discharging to surface waters or recharging deeper aquifers. RIA does not contain any Sole Source Aquifers or Critical Aquifer Protection Areas as defined by EPA under the authority of the Safe Drinking Water Act.

Groundwater levels at RIA are influenced by water level fluctuations of the Mississippi River. Groundwater in the area is generally obtained from limestone crevices at depths of 100 to 300 feet below land surface. Groundwater is currently not used at RIA for any purpose.

4.6.1.3 Floodplains

EO 11988, "Floodplain Management" (signed May 24, 1977), directs federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the

occupancy and modification of floodplains. Every year the water level of the Mississippi River rises in spring due to rain and snow melt. These seasonal events are typical and have little or no effect on RIA's operations. Due to RIA's location, it is prone to flood events. A 100-year flood event will inundate low areas at RIA, but can be controlled by the existing flood protection system, which consists of earthen levees, flood walls, and gates.

Portions of RIA have been mapped as 100-year floodplain areas on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs). Based on the FIRMs prepared for Rock Island County, Illinois, Buildings 68 and 299 are not located in the 100-year floodplain, although the southern part of Building 299 is close to the mapped floodplain boundary. Due to the proximity of Building 299 to the 100-year floodplain and Sylvan Slough, flood protection structures have been constructed around portions of the building.

Wetlands

Wetlands at RIA have been mapped by USFWS as part of its National Wetlands Inventory (NWI). Areas that potentially qualify as wetlands are primarily located in the eastern and western ends of the installation. There are no potential wetlands within the immediate vicinities of Buildings 68 or 299. Two small potential wetlands exist south of Building 299 adjacent to Sylvan Slough.

4.6.2 Consequences

4.6.2.1 Proposed Action

The proposed remodeling of Buildings 68 and 299 would not have any direct impacts on surface waters or wetlands because none are located in the immediate vicinity of the buildings. Neither building is located within the 100-year floodplain, although the southern part of Building 299 is close to the mapped floodplain boundary. The nearby floodplain and the flood protection structures around the building would not be affected by the proposed action. Construction activities would not result in significant soil disturbance or loss of vegetative cover. The remodeling work would be confined to the footprints of the buildings. There would be no increase in impervious area and no change in stormwater runoff characteristics or volume. Sediment and erosion controls would be implemented during construction to prevent any indirect impacts to surrounding soils or surface waters. Such controls may include silt fences, hay bales, and seeding of cleared areas that are to remain exposed for long periods of time. Little or no groundwater dewatering is expected to be required during construction activities. The proposed action would not result in withdrawals from, or discharges to, surface waters, groundwater, or wetlands.

For these reasons, the proposed action would have no effect on wetlands or floodplains. Any impacts to surface waters or groundwater would be temporary and negligible.

4.6.2.2 No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. Therefore, the no action alternative would have no effect on water resources.

4.7 Biological Resources

4.7.1 Affected Environment

4.7.1.1 Vegetation

Much of the vegetation native to RIA has been displaced by introduced species, with the exception of unimproved woodlands and areas that have not been regularly maintained. RIA has approximately 70 acres of woodlands, which consist mostly of deciduous hardwood species. The woodlands are concentrated around the Tank Test Track area. Grasslands containing a variety of grasses and forbes also exist on the island. The RIA Integrated Natural Resources Management Plan (INRMP) provides a comprehensive list of the plant species that exist on the island. The immediate areas around Buildings 68 and 299 are mostly developed and consist only of mowed grass and sparse landscaping vegetation.

4.7.1.2 Wildlife

Most of the wildlife habitat at RIA is located in the unimproved and semi-improved areas in the eastern part of the island. Typical wildlife that occur on the island include rodents, furbearers, deer, terrestrial game birds, song birds, raptors, wading birds, and waterfowl. Due to its location within the Mississippi River, RIA is utilized by several species of reptiles and amphibians. The river provides habitat for a variety of aquatic wildlife species. Fishing is permitted in authorized areas along the island perimeter. Hunting is limited to occasional supervised deer hunting to control herd size. The immediate areas around Buildings 68 and 299 provide poor quality wildlife habitat because they are mostly developed.

4.7.1.3 Sensitive Species

Three federally listed species have been documented to occur in Rock Island County, Illinois: the bald eagle (*Haliaeetus leucocephalus*), Higgin's eye pearly mussel (*Lampsilis higginsii*), and Indiana bat (*Myotis sodalists*). The bald eagle is federally listed as Threatened and the Higgin's eye pearly mussel and Indiana bat are both federally listed as Endangered. The bald eagle winters in the county and utilizes large rivers, lakes, and reservoirs. The bald eagle is commonly sighted in the vicinity of Lock and Dam 15 at RIA. A *Bald Eagle Management Plan* has been developed for RIA and is included in the RIA INRMP. Suitable habitat for the Indiana bat exists at RIA; however, no individuals were sighted during a survey conducted in 1996. The Higgin's eye pearly mussel is listed for the Mississippi River north of Lock and Dam 20 which includes RIA. A mussel sanctuary is adjacent to Arsenal Island in Sylvan Sough above the hydroelectric dam. A mussel survey conducted in 1994 confirmed the presence of the Higgin's eye pearly mussel in Sylvan Slough. No portion of RIA is designated as Critical Habitat for these federally listed species.

Arsenal Island is also located within the known range of the following six state-listed species: western hognose snake (*Heterodon nasicus*), alligator snapping turtle (*Macroclmys temmincki*), Illinois mud turtle (*Kinosternon flavescens spooneri*), eastern massasauga rattlesnake (*Sistrurus catenatus*), double-crested cormorant (*Phalacrocorax auritus*), and brown creeper (*Certhia Americana*).

The immediate areas around Buildings 68 and 299 are not expected to be utilized by any of these state or federally listed species.

4.7.1.3 Migratory Birds

U.S. Department of Defense (DoD) installations are required to comply with the Migratory Bird Treaty Act (MBTA). The 2003 Defense Authorization Act required USFWS to reduce restrictions to military readiness training caused by migratory birds. DoD has agreed to work to conserve bird species of conservation concern (BCC species) on installations. Several BCC species have been documented to occur on Arsenal Island.

4.7.2 Consequences

4.7.2.1 Proposed Action

Most of the construction activity for the remodeling of Buildings 68 and 299 would occur within the interiors of the buildings. Construction activity that occurs on the building exteriors may have a minor, temporary impact on vegetation, which consists entirely of mowed grass and sparse landscaping vegetation. After construction is completed, any affected areas would be restored to original vegetative conditions. The establishment and operation of staging areas for the remodeling, as well as general construction noise, may temporarily disturb the common wildlife species that utilize the areas around the buildings. The immediate areas around Buildings 68 and 299 provide poor quality wildlife habitat because of they are mostly developed. These areas are not expected to be utilized by any state or federally listed species. Any disturbance experienced by common wildlife species would be limited to the construction period and is expected to be minimal. None of the work is expected to affect sensitive species, migratory birds, or their habitats. The proposed action has been coordinated with USFWS (Appendix A). USFWS issued a “no objection” reply for the proposed action on 23 January 2007 (see Appendix A).

For these reasons, the proposed action would have a temporary and negligible impact on vegetation and wildlife and no effect on sensitive species or migratory birds.

4.7.2.2 No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. Therefore, the no action alternative would have no effect on biological resources.

4.8 Cultural Resources

4.8.1 Affected Environment

Cultural Resources are defined in Army Regulation 200-4, Cultural Resources Management, Headquarters, Department of the Army, as:

- Historic Properties, protected through the National Historic Preservation Act (NHPA)
- Archaeological Resources, protected through the Archaeological Resources Protection Act (ARPA)
- Cultural Items, as specified in the Native American Graves Protection and Repatriation Act (NAGPRA)

- Sacred Sites, as referenced in the American Indian Religious Freedom Act (AIRFA) and EO 13007
- Collections of artifacts and records pertaining to them as defined in 36 CFR 79

The RIA *Integrated Cultural Resources Management Plan* (ICRMP) provides guidance on the proper management of cultural resources at the installation. The RIA ICRMP is reviewed annually and updated as needed in conjunction with changes to the installation mission and management practices.

Because all work and disturbance would be confined to existing building footprints or previously disturbed areas, the proposed action would not affect archeological sites or Native American resources at RIA. Therefore, archeological and Native American resources are not discussed further.

RIA was designated as a National Register of Historic Places (NRHP) Historic District in 1969. A portion of the Historic District was designated as a National Historic Landmark (NHL) in 1988. The primary components of the RIA Historic District are the Stone Shop Industrial Core and the Commanding Officer's Quarters Residential Zone.

Both Buildings 68 and 299 are contributing buildings to the NRHP Historic District and NHL designations. According to the NRHP ranking system, Building 68 is a Category 1 structure, which is defined as being of Major Historic Importance. Building 299 is a Category 3 structure, which is defined as being of Minor Historic Importance. Table 4-3 provides information on Buildings 68 and 299 pertinent to their historical significance.

TABLE 4-3
Historical Information for Buildings 68 and 299 at RIA
EA for Implementation of BRAC Actions at Rock Island Arsenal

Building	Name/Function	Date	Design/ Construction	Style	Material
68	Stone Shop K (Armory)	1881-1893	Rodman/Flagler	Greek Revival	Limestone
299	Warehouse	1942	Unknown	Utilitarian	Concrete

4.8.2 Consequences

4.8.2.1 Proposed Action

As discussed in Section 4.8.1, Buildings 68 and 299 are contributing buildings to the NRHP Historic District and NHL designations of RIA. The proposed remodeling of Buildings 68 would not involve significant structural modifications to the building. The remodeling would primarily involve modifications to the interior layout of the building and would not affect the historic value of the structure. The remodeling of Building 299 would involve modifications to a portion of the building interior to provide space for the incoming munitions storage and production functions. The most significant structural modification that would be made would be raising one of the high bays approximately 20 feet to accommodate the equipment from Riverbank AAP. Raising one of the high bays of the building would not have a significant impact on the structural integrity of the facility and would not diminish the historic value of the structure. According to the NRHP ranking

system, Building 299 is a Category 3 structure, which is defined as being of Minor Historic Importance. The proposed action has been coordinated with the Illinois SHPO (see Appendix A).

For these reasons, the proposed action would have a negligible impact on cultural resources.

No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. Therefore, the no action alternative would have no effect on cultural resources.

4.9 Socioeconomics

Socioeconomics comprises a number of resource areas including the following: population, economic activity (employment, unemployment, and income), housing, public schools, and public safety services. Additionally, the topics of environmental justice and protection of children are included. Effects attributable to implementation of the proposed action on socioeconomic resources are assessed primarily through the use of the Economic Impact Forecast System (EIFS) model. Developed by the U.S. Army Construction Engineering Research Laboratory (CERL), the model provides a consistent method to evaluate specific socioeconomic effects associated with BRAC actions regardless of the location within the nation (U.S. Army Corps of Engineers [USACE], 1994).

4.9.1 Region of Influence

The region of influence (ROI) is the geographic area within which the majority of impacts to socioeconomic resources are concentrated. The ROI for RIA is a five-county area comprised of three counties in Illinois (Henry, Mercer, and Rock Island) and two counties in neighboring Iowa (Muscatine and Scott). As such, the ROI coincides with the counties comprising the Bi-State Regional Commission and includes two counties (Mercer County in Illinois and Muscatine County in Iowa) not contained in the Davenport, Iowa-Illinois Metropolitan Statistical Area (MSA), as defined by the Bureau of the Census. This general area is also commonly referred to as the "Quad City" area, which is variously defined as the Cities of Davenport (Iowa), East Moline (Illinois), Moline (Illinois), Rock Island (Illinois) or Davenport (Iowa), Bettendorf (Iowa), Moline (Illinois), and Rock Island (Illinois).

4.9.1.1 Economic Development

RIA Employment.

RIA is one of the largest employers in the area. As the largest government-owned weapons manufacturing arsenal in the western world, the Arsenal provides manufacturing, logistics, and base support services for the Armed Forces. RIA is the largest employer in the Quad Cities area, with an estimated workforce of more than 6,600 jobs. The business conducted on the island supports more than 12,000 additional jobs in surrounding communities. The total annual economic impact is more than \$1 billion to the local economy.

Regional Employment.

Total full- and part-time employment in the five-county ROI increased by almost 35,000 jobs between 1980 and 2004 (Bureau of Economic Analysis [BEA], 2006). The large majority of that growth (93 percent) took place in the decade of the 1990s when the annual rate of change in employment averaged 1.4 percent annually. This compared to a growth rate during the same time period of 1.5 percent for the State of Illinois and 1.9 percent for the State of Iowa. The ROI annual growth rate over this period (1990 to 2000) was dramatically greater than that over the period from 1980 to 1990 (0.3 percent) and 2000 to 2004 (when there was an absolute decline in employment). About 80 percent of regional employment is contributed by the combination of Rock Island County (Illinois) and Scott County (Iowa). Over the period from 1980 to 2004, that share of regional employment contributed by Rock Island County declined from 42.5 percent to 37.2 percent, while the contribution of Scott County increased from 37.4 percent to 41.9 percent.

The greatest share of non-farm employment in the ROI in 2004 was concentrated in four sectors of the economy: services (38.7 percent); manufacturing (13.0 percent); federal, state, and local government (12.5 percent); and retail trade (12.4 percent). Over the two-decade time period between 1980 and 2000, the share of total employment contributed by the services sector increased from 19.5 percent to 29.9 percent. The share of total employment in the manufacturing sector of the economy fell from 27.5 percent to 17.7 percent. The share contributed by federal, state, and local government employment declined slightly from 14.1 percent to 12.0 percent, while employment in retail trade increased slightly from 17.1 percent to 18.0 percent. Virtually all losses in manufacturing employment were transferred to employment in service industries.

Major employers (more than 1,000 employees) in the region, in addition to the RIA, include the following business types: manufacturing (Deere and Company with 6,400 workers and Alcoa with 2,200 workers); health care (Genesis Health System with 4,730 workers and Trinity Regional Health System with 2,650 workers); food processing and meat products (Tyson with 2,400 workers and Kraft Foods with 1,500 workers); and utility and energy delivery (MidAmerica Energy with 1,230 workers).

Over the period 1990 through 2005, unemployment rates for each of the counties comprising the ROI have mirrored those of the states of Illinois and Iowa and the nation (Bureau of Labor Statistics [BLS], 2006). Rates peaked in 1992 with values of 7 percent and above for the counties in Illinois, the State of Illinois, and the nation. Rates for the State of Iowa and the counties in Iowa remained lower, between 4.5 percent and 5.5 percent. Rates declined consistently through 1998, with rates as low as about 3 percent in the counties in Iowa and between 4 percent and 5 percent for the counties in Illinois. Rates then rose, peaking in 2003 (but lower than the peak rates experienced in 1992), and have since declined. Unemployment rates in the State of Iowa and the counties of the ROI located in Iowa have consistently been lower than the rates for the State of Illinois, counties located in Illinois, and the nation.

4.9.1.2 Demographics

During the 1980s, each of the counties of the ROI, the Davenport MSA, and the State of Iowa experienced population losses (U.S. Census Bureau, 2006). These losses exceeded 10 percent for the counties in the State of Illinois. The ROI lost more than 8 percent of its population. The decrease was linked to high unemployment rates associated with major farm and

construction equipment plant closings throughout the region. The decade of the 1990s saw modest or no population increase for the counties in the State of Illinois, but increases of about 5 percent for the Iowa counties. The population of the ROI increased by 2.4 percent during this time period. By 2005, the population of Scott County had returned to its 1980 level, Muscatine County had exceeded the 1980 level slightly, and none of the Illinois counties had attained their 1980 population levels. Forecasts show modest population growth for the period through 2030.

The urban area of the ROI includes the cities of Bettendorf and Davenport in Scott County, Iowa, and East Moline, Moline, and Rock Island in Rock Island County, Illinois. The City of Davenport is the largest of the cities in the ROI, with an estimated population of 98,845 as of 2005. Davenport has experienced modest growth over the period 1990 to 2005. However, the fastest growing community is the City of Bettendorf, which increased by 11.2 percent between 1990 and 2000. The City of Rock Island saw its resident population decrease 2.1 percent between 1990 and 2000, with a further 2.5-percent decrease between 2000 and 2005.

The on-post population of RIA includes military personnel assigned to the installation, military dependents residing in family housing, civilian Army employees, and civilian tenants. The post also supports military dependents residing off-post and retired military personnel and their families who use the facilities located on the post. The *Army Stationing and Installation Plan* (ASIP) for RIA projects a 3.6 percent decrease in Arsenal employment by 2011 (RIA, 2006).

The region surrounding RIA contains a number of military retirees, many of whom receive pay from the DoD. The area encompassed by zip codes that begin with 527, 528, and 612 approximates the five-county ROI and contains 1,810 retired military personnel (DoD, 2005). Of these, about 870 are Army retirees. The DoD retirees received about \$28.5 million in payments in 2005, of which Army retirees received about \$11.6 million.

Per-capita income for residents of the Davenport MSA was \$31,205 in 2004, which was about 5 percent above that for the State of Iowa, about 10 percent below that for the State of Illinois, and about 6 percent below the national level (BEA, 2006). The per-capita income for Scott County residents was the highest of the ROI counties (\$33,054) and equal to that of the nation. Per-capita incomes for the Illinois counties were lower than those of the Iowa counties.

4.9.1.3 Housing and Community Services

On-post Housing.

Housing on RIA includes Military Family Housing (MFH) and Unaccompanied Personnel Housing (UPH) units, which are scattered throughout the northern half of the island occupied by RIA (RIA, 2006). There are a total of 54 government-owned housing units, of which 20 are designated as officer family housing and 34 as enlisted family housing. Five of the 34 family housing units are diverted to UPH. The majority of units (33) are three-bedroom units, 11 units contain four bedrooms, three have six bedrooms, one unit has seven bedrooms, and one unit has two bedrooms.

Off-post Housing.

The total number of housing units in the five-county ROI was 175,303, as reported in the 2000 Census (U.S. Census Bureau, 2006). Of this total, 5.6 percent were vacant and of the occupied units, 72 percent were owner-occupied, with the remaining 28 percent renter-occupied. As reported in the 2006 Housing Requirements Analysis (Headquarters, Department of the Army [HQDA], 2006), the housing vacancy rate in the region is estimated at 6.8 percent in 2006 and the rental vacancy rate is estimated at 5.6 percent.

Of the occupied housing units in the ROI, just over 75 percent are single family structures (detached or attached), just over 4 percent are mobile homes, and the remainder are contained in multiple family structures (U.S. Census Bureau, 2006). For the Davenport MSA, the median year structures were built in 1960 for owner-occupied units and 1961 for renter-occupied units. Sub-standard housing units (described as lacking complete plumbing and kitchen facilities) comprise only 1.3 percent of the housing stock. As of 2000, the median contract rent was \$386 and the median sale price asked was \$70,000. As reported in the 2006 Housing Requirements Analysis, median monthly rents in the region were as follows: \$500 for one-bedroom units; \$620 for two-bedroom units; \$695 for three-bedroom units; and \$1,150 for units with four or more bedrooms. Rent levels vary considerably by location within the ROI, with average monthly rents of about \$770 in Bettendorf, \$690 in Rock Island, \$660 in Moline, \$600 in Davenport, and \$450 in East Moline.

A complete building cycle occurred between 1980 and 1997, with consistently declining activity from 1980 to 1987 and almost consistent increases in activity between 1987 and 1997 (with the exception of 1994 and 1995, when a slight drawback in activity took place). This was followed by a second cycle between 1997 and 2005.

Over the 25-year period between 1980 and 2005, the number of housing units authorized for construction in the ROI ranged from highs of 1,767 units in 1980, 1,627 units in 1997, and 1,693 units in 2005 to lows of 383 units in 1987 and 1,204 units in 2000.

Medical Facilities.

Medical facilities within the ROI serve the needs of both the community and RIA. Facilities include nine hospitals with 1,378 beds, and approximately 800 practicing physicians. Proximity (50 miles) to the University of Iowa Medical Center provides additional medical care through the world's largest university-owned research hospital located in Iowa City, Iowa (RIA, 2006).

Educational Facilities.

The five-county ROI contains 28 school districts, the largest of which (in terms of enrollment) include the following: Geneseo (2,812 students) in Henry County; Sherrard (1,733 students) in Mercer County; East Moline (2,432 students), Moline (7,664 students), and Rock Island (6,551 students) in Rock Island County; Muscatine (5,356 students) in Muscatine County; and Davenport (15,987 students) and Bettendorf (4,332 students) in Scott County (National Center for Education Statistics [NCES], 2006).

There is considerable variation in the racial and ethnic composition of the student body of the school districts, with high concentrations (more than 20 percent of total enrollment) of Hispanic students, especially in West Liberty and Muscatine school districts in Muscatine County and East Moline school district in Rock Island County. Just over 10 percent of the students of West Liberty school district are migrant students. High concentrations of black

students exist in the Rock Island and Davenport school districts. In three of the school districts in Rock Island County (Carbon Cliff-Barstow, East Moline, and Rock Island), more than 50 percent of the students receive free or reduced-cost lunches.

The region contains three private colleges, two community colleges, a graduate center, and technical and trade colleges. These facilities meet the needs of the community, as well as the needs of RIA employees and their families. In particular, Western Illinois University and St. Ambrose University maintain facilities on RIA to benefit military and civilian residents and employees (RIA, 2006).

There are many services for military personnel, civilian and contractor employees, and retirees on the installation: Army Community Service, Fitness Center, Child Development Center, School Age Center, Outreach Programs, Employee Assistance Programs, a Food Court, Auto Craft Shop, Commissary, Post Exchange, Golf Driving Range, Outdoor Recreation Center, and storage facilities (RIA, 2006).

The Child Development Services program at RIA provides full-time, part-time, and hourly services to military and civilian employees of the Arsenal. Program staff includes 39 personnel who provide care for 104 children (RIA, 2006).

4.9.1.4 Installation Security and Fire Protection Services

Installation Security.

The Directorate of Law Enforcement and Security provides security for RIA and consists of the Police Department and the Security and Intelligence Division. The Security and Intelligence Division is responsible for issuing identification badges and vehicle permits. The police force is comprised of 50 civilian police officers. The Directorate has cooperative agreements with all local fire departments, hazardous materials (HAZMAT) teams, and police departments, including county and state. The Rock Island Police Department and the Quad City Bomb Squad are active with the RIA police department. Directorate assets include six squad cars (five marked, one unmarked), three mini-vans, a command vehicle, and a Special Response Team (SRT) van (RIA, 2006).

The hours of operation for the three gates are as follows: Moline Gate - open 24 hours a day, 7 days a week, and all commercial vehicles must enter through this gate; Davenport Gate - open 16 hours a day, 7 days a week; and Rock Island Gate - open 12 hours a day, 5 days a week (RIA, 2006).

Fire Protection.

Fire protection services are provided by the RIA Fire Department, centrally located in Building 225, with an average response time of 3 minutes anywhere on the island. The fire department employs 29 civilian firefighters who work 24-hour shifts with between 8 and 12 firefighters on duty at any given time (RIA, 2006).

Fire Department assets include a front line pumper, 100' ladder truck, reserve pumper, utility truck used for HAZMAT response, HAZMAT trailer, ambulance, command vehicle, utility vehicle, and four boats for river patrols and search and rescue (RIA, 2006). Buildings 68 and 299 have fire sprinkler systems.

4.9.1.5 Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (1994), requires federal agencies to achieve environmental justice "to the greatest extent practicable" by identifying and addressing "disproportionately high adverse human health or environmental effects of...activities on minority populations and low income populations."

Utilizing information from the 2000 Census, the five-county ROI has a minority population comprising almost 14 percent of the total population and 10 percent of the residents living below the poverty level. There is considerable variation within the ROI regarding these two characteristics at both the county and community levels. Rock Island County has the highest share of minority population (18.5 percent) and persons living below the poverty level (10.7 percent), while the lowest shares are registered by Mercer County (2.4 percent and 7.8 percent, respectively).

Only one of the five major communities in the ROI (Bettendorf) has a smaller minority population share than the ROI as a whole. The largest minority population concentration is in the City of East Moline (26.3 percent), followed by the City of Rock Island (25.7 percent). The cities of East Moline, Rock Island, and Davenport exhibit a higher proportion of their respective populations living below the poverty level than the ROI.

4.9.1.6 Protection of Children

RIA follows the guidelines as specified for the protection of children as indicated in EO 13045, *Protection of Children from Environmental Health Risks and Safety Risk* (Federal Register: April 23, 1997, Volume 62, Number 78). This EO requires that federal agencies shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that policies, programs, and standards address disproportionate risks to children that result from environmental health or safety risks. Children are present at RIA in family housing, the day care center, and recreational facilities.

The percentage of school-age children in the ROI is below that for the State of Illinois and above that for the State of Iowa. The highest proportion of the population in this age category in the ROI is Bettendorf, with 20.1 percent.

4.9.1.7 Other BRAC Actions

RIA was identified for realignment under the 2005 BRAC initiative. Proposed BRAC realignments call for RIA to lose several administrative tenants and to gain one headquarters activity (the subject of this analysis). Among the outgoing tenants are TACOM Life Cycle Management Command (LCMC), IMA-NW and NETCOM-NW, and DFAS. TACOM-LCMC will relocate to TACOM Headquarters in Warren, Michigan, and Columbus, Ohio; IMA-NW and NETCOM-NW to Ft. Sam Houston, Texas; and DFAS to various DFAS operating locations. The outgoing moves are scheduled to occur between 2007 and 2011. Also forecasted for RIA is the transition of the Army Field Support Command to the Army Sustainment Command. This action would involve the relocation of an additional 250 soldiers to RIA. When combined with the military personnel in the 1st U.S. Army Headquarters, the Arsenal could experience one of the largest increases in

military personnel in its history. The net result of these realignment and other actions would be a net increase of about 400 military personnel relocating to RIA and a net loss of just over 1,400 civilian personnel.

4.9.2 Consequences

4.9.2.1 Proposed Action

In terms of personnel, the proposed action involves 281 military and 149 civilian personnel (stationed at Fort Gillem), and 60 contractors (located at Riverbank AAP). It is not anticipated, however, that all these persons will relocate to RIA. Of the 281 military personnel, 132 of the positions would be filled by personnel currently residing in the region, resulting in a net relocation of 149 military personnel (and their family members). Of the 149 civilian personnel currently at Fort Gillem, it is estimated that only about 35 would relocate to RIA. It is expected that only 15 of the 60 contractors currently at Riverbank AAP would relocate to RIA. Thus, a total of 149 military, 35 civilian, and 15 contractor personnel would physically relocate to RIA. The remaining positions would be filled by military and civilian persons currently resident in the ROI.

Economic Development.

The Economic Impact Forecast System (EIFS) model is used to estimate the economic effects of the proposed action and the results are compared to rational threshold values (RTVs) as a means of evaluating the significance of these effects in relation to the regional economy. RTVs are positive and negative percent changes in sales volume, income, employment, and population that represent an acceptable range around the maximum historic fluctuations that have occurred within the ROI over the period 1969 through 2000. Detailed EIFS model reports that contain the model inputs, outputs, and significance measures are included in Appendix C.

Construction Phase.

Construction is expected to last approximately one year and, in the short term, expenditures in the local economy for goods and services and direct employment associated with construction would increase sales volume, employment, and income in the ROI. It is estimated that total construction costs to implement the proposed action would be just over \$19 million. These economic benefits will be temporary, lasting only for the duration of construction activity. It is assumed that approximately 40 percent of the total project costs of just over \$19 million, i.e., approximately \$7.8 million, would be wage and salary payments to construction workers. Such expenditures would support approximately 185 full-time construction jobs (see Appendix C). In addition to payroll expenditures for the required labor, construction activities would require the procurement of materials and services. These procurements, many of which would occur within the region, and the personal consumption expenditures of the construction workers at local and regional retail and service establishments would create an economic multiplier effect. This effect would result in indirect and induced employment creating a total regional demand for about 426 full-time jobs. This employment level corresponds to less than 0.1 percent of regional baseline employment. Additional income associated with the direct construction jobs would be about \$9.2 million, and almost \$6.8 million for induced jobs, for a total increase in income of

almost \$16 million. Suppliers in the ROI would experience a short-term increase in the sale of construction-related materials and provision of services.

Table 4-4 presents estimates of both the direct effects of construction activities and the induced effects in related industrial sectors that would be affected by construction expenditures and employment. The percentage increase in sales volume, income, employment, and local off-post population are relatively minor and fall within the range of historical fluctuations in those economic parameters, as represented by the RTVs for the region. Short-term minor beneficial effects to the regional economy can be expected from the construction activities required to implement the proposed action.

TABLE 4-4
EIFS Model Output for the Proposed Construction Activities
EA for Implementation of BRAC Actions at Rock Island Arsenal

Indicator	Projected Change	Percentage Change	Range of RTVs
Sales Volume-Direct	\$14,793,210	--	N/A
Sales Volume-Induced	\$40,385,460	--	N/A
Sales Volume- Total	\$55,178,670	0.29%	-8.11 % to 11.04 %
Income-Direct	\$9,228,120	--	N/A
Income-Induced	\$6,754,270	--	N/A
Total Income¹	\$15,982,390	0.16%	-8.04 % to 9.54 %
Employment-Direct	250	--	N/A
Employment-Induced	176	--	N/A
Total Employment	426	0.17%	-4.17 % to 5.16 %
Local Population	0	0%	N/A
Local Off-base Population	0	0%	-0.87 % to 1.48 %

Notes:

¹Place of work income

RTV = rational threshold value

N/A = not applicable

Operations Phase.

In the long term, the personal consumption expenditures of the new military and civilian personnel and their respective dependents who are employed would generate additional economic activity in the regional economy. There would be approximately 560 annual full-time jobs during the operation phase of the project (see Appendix C). Additionally, the multiplier effect would result in induced employment of 200 jobs, creating a total regional demand for about 760 full-time jobs. Although beneficial, the long-term effects to the regional economy forecast by the EIFS model are considered minor in comparison to historical fluctuations, as represented by the RTVs. The additional employment equates to about 0.3 percent of baseline employment in the ROI. Total income associated with both direct and induced jobs would total about \$34.7 million annually (Table 4-5). Local

governments could experience additional costs for schools, roads, and other public services, but could also benefit from additional sales tax and property tax income (from those additional residents residing off-post).

TABLE 4-5
EIFS Model Output for Operations
EA for Implementation of BRAC Actions at Rock Island Arsenal

Indicator	Projected Change	Percentage Change	Range of RTVs
Sales Volume-Direct	\$16,774,930	--	N/A
Sales Volume-Induced	\$45,795,570	--	N/A
Sales Volume- Total	\$62,570,500	0.33%	-8.11 % to 11.04 %
Income-Direct	\$27,104,020	--	N/A
Income-Induced	\$7,659,084	--	N/A
Total Income¹	\$34,763,100	0.34%	-8.04 % to 9.54 %
Employment-Direct	563	--	N/A
Employment-Induced	200	--	N/A
Total Employment	763	0.30%	-4.17 % to 5.16 %
Local Population	830	--	N/A
Local Off-Base Population	816	0.2%	-0.87 % to 1.48 %

Notes:

¹Place of work income

RTV = rational threshold value

N/A = not applicable

Demographics and Public Services.

The workforce required during the construction phase of the proposed action would be available within the region and no in-migration with attendant population increase would occur. During the operations phase, regional population could increase by about 830 persons, with virtually all residing in off-post communities. Such a population increase represents a negligible proportion (0.2 percent) of baseline population within the ROI. The population increase could result in a minor increase in demand for public services such as schools.

A net population increase of 830 persons could include about 155 children of school age. The addition of this number to current region-wide enrollment would be negligible: an increase of 0.3 percent.

Increases in resident population and demand for public services associated with implementation of the proposed action would be more than offset by other BRAC actions that call for the relocation and loss of civilian jobs at the RIA.

Environmental Justice and Protection of Children.

The proposed action would be confined to RIA and construction activity involves the remodeling of existing structures that are not located near on-post family housing or off-post residential areas. Safety measures to protect pedestrians, including children, would be implemented during construction. Therefore, the proposed action would not affect minority or low-income populations or children.

4.9.2.2 No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. There would be no short-term increase in construction-related jobs and wages, and no associated increase in local sales of construction-related materials. Therefore, the no action alternative would have no effect on socioeconomics.

4.10 Transportation

4.10.1 Affected Environment

4.10.1.1 Regional Roadways and Traffic

The Quad Cities area has a well-developed highway network containing 4 interstate highways, 10 state highways (8 in Illinois and 2 in Iowa), and a variety of local thoroughfares. Interstates I-80 and I-280 form an outer loop encircling the metropolitan area; I-80 on the north and east and I-280 on the west and south. North/south interstate access is provided by I-74, which bisects the interstate loop and continues south and southeast to Peoria and Indianapolis, and I-80 extends east to Chicago and west to Des Moines. I-88 also connects the area to Chicago.

The Mississippi River, which bisects the metropolitan area from east to west, is crossed by five vehicular bridges (three interstate and two local). More than 150,000 vehicles cross the Mississippi River on an average day, with a majority (77,800 per day) crossing via the I-74 bridges located east of RIA. In a recent effort to alleviate traffic on other crowded bridges, tolls on the Centennial Bridge (the U.S. 67 crossing of the Mississippi River just to the west of RIA) were discontinued. It is projected that this action will reduce traffic on the I-74 bridges by 5,000 vehicles per day.

A number of improvements to the transportation system are planned that include: (i) widening of the I-74 bridges to six lanes with improvements to the approaches and corridor; (ii) improved access to RIA; and (iii) Intelligent Transportation Systems (ITS) technology improvements. In addition, a new four-lane bridge over the Mississippi River is proposed within the next 10 to 15 years between East Moline and Bettendorf to improve traffic congestion in the I-74 corridor and to eliminate a 9-mile crossing gap.

4.10.1.2 Installation Transportation

Island Access.

Three bridges provide access to RIA:

- Rock Island Viaduct provides access from Rock Island, Illinois, over Sylvan Slough, a side channel of the Mississippi River. Entry is via the RIA entrance gate on the southwestern part of the island.
- Government Bridge crosses the main channel of the Mississippi River from Davenport, Iowa, adjacent to Lock and Dam No. 15 on the northwestern part of the island. Access to the installation is through the Davenport entrance gate.
- Moline Bridge, spanning Sylvan Slough, provides access from Moline, Illinois, to the eastern part of the Island. Access is through the Moline entrance gate.

All bridges are two-lane, two-way structures. The Rock Island Viaduct and Moline Bridge are newer structures with 12-foot lane widths. The Rock Island Viaduct provides for pedestrian traffic with a sidewalk located behind a barrier curb. An unnamed bicycle/pedestrian bridge is located immediately adjacent the Rock Island Viaduct. Pedestrians are prohibited from using the Moline Bridge. Government Bridge has two decks: the lower is for vehicular and pedestrian traffic and the upper is for rail traffic. It has a swingspan at the Arsenal end. Swingspan openings can occur 10 times per day during the 10-month navigational season of March through December and can cause substantial traffic disruption.

In 2006, two-way average daily traffic (ADT) volumes of the three bridges were: Government Bridge 10,297 vehicles per day (vpd), Rock Island Viaduct 7,228 vpd, and Moline Bridge 7,423 vpd. ADT volumes on both the Rock Island Viaduct and Government Bridge have decreased significantly from their 1995 levels (60 percent and 44 percent, respectively). The decreases are attributed to the reduction of the Arsenal workforce and the elimination of the tolls on the nearby Centennial Bridge.

Existing Circulation.

The main thoroughfare on the installation is Rodman Avenue, an east-to-west arterial that accommodates the majority of the onsite traffic. It is two lanes wide from the Moline Bridge to East Street, where a third lane continues to the Government Bridge. The third lane functions as an exclusive left turn lane between East Street and West Pershing Street. Between West Pershing Street and Rock Island Drive the third lane is reversible.

Rock Island Drive, a short primary road, branches off Rodman Avenue and connects to Rock Island, Illinois, to the southwest via the Rock Island Viaduct. Fort Armstrong Avenue, the north-to-south connection between the Rock Island Viaduct and the Government Bridge, is the route used for non-RIA interstate traffic between Iowa and Illinois.

The remaining installation roadway system generally represents an east-west/north-south grid pattern, especially on the western half of the island. Secondary roadways loop to the north and south of Rodman Avenue through the administrative and industrial portions of the installation. Because the concentration of the installation workforce is in this section of the island, the roadways function as distributors to these buildings and parking areas. The roadway system on the island is comprised predominantly of two-lane, two-way traffic paved streets having a speed limit of 25 miles per hour (mph).

There are a number of minor roads serving the installation in a general east-to-west direction, some of which are former through streets that have been gated or fenced for security reasons.

The majority of parking on the installation is off-street and for long-term usage. Only a small portion of the on-street parking that exists has time limits. Parking resources can be categorized as general, reserved, visitor, motorcycle, and handicap, with the reserved further subdivided into executive and handicap. There are 7,062 off-street parking spaces and 418 on-street parking spaces on the installation.

Rail.

The Iowa Interstate Railroad currently provides rail service to RIA. The rail route that crosses the installation, from the upper deck of the Government Bridge to the railroad bridge crossing the Sylvan Slough, is leased to the Iowa Interstate Railroad. Existing rail on the installation serves the shipping and receiving area, the steam plant, and the manufacturing area. A small classification yard is also located on the installation. The installation does not own or operate rail equipment and all on-post switching is provided by the commercial rail company.

Traffic Circulation.

There are approximately 3,300 vehicles entering RIA during the a.m. peak hour and almost 3,000 vehicles departing during the p.m. peak hour. In the morning, inbound traffic is distributed over the three bridges providing access to RIA: Moline Bridge 61 percent; Government Bridge 11 percent; and Rock Island Viaduct 28 percent. In the afternoon, outbound traffic is distributed as follows: Moline Bridge 71 percent; Government Bridge 19 percent; and Rock Island Viaduct 10 percent.

Overall, peak-hour traffic levels are accommodated reasonably well by the transportation system. Prior to the gradual decrease in population that has taken place since 1986, traffic congestion was a major issue. Since then, however, with the exception of the Government Bridge delays (attributable to swingspan openings), roadways operate at acceptable levels of service.

4.10.1.3 Other Regional Transport Modes and Public Transportation

The major railroads serving the metropolitan area are the Burlington-Northern-Santa Fe Railroad Company, Iowa Interstate Railroad, Iowa, Chicago, & Eastern Railroad Corporation (formerly I & M RailLink), and Amtrak - Northeast/Southwest Passenger in Davenport, Iowa. There are two existing railroad crossings over the Mississippi River, the Crescent Bridge and the Government Bridge.

The Quad Cities Airport, located approximately 6 miles south of RIA in Moline, Illinois, is the closest airfield to the Arsenal. There are approximately 60 arrivals and departures per day, with one-stop service through the hubs of Atlanta, Chicago (Midway and O'Hare), Cincinnati, Denver, Detroit, Minneapolis, Orlando, and St. Louis. There is a U.S. Army Aviation Detachment assigned to RIA at the Quad Cities Airport with hangar facilities and fixed wing Army aircraft.

About 6 miles north of the RIA is the Davenport Municipal Airport, a general aviation airport located near Mount Joy, Iowa. Company B-47th Aviation Battalion of the Iowa National Guard uses the facility.

Water transportation is available over the Inland Waterway System of the Mississippi River that allows transportation of goods to various locations in the Midwest and connects with the Great Lakes and various points on the Gulf of Mexico. The Mississippi River has a channel depth of 9 feet and a 10-month navigation season. From December to March, sections of the upper Mississippi River lock system are closed to barge traffic. Lock and Dams 14 and 15 (both 600 feet in length) are located near the Arsenal and are maintained by the Rock Island District of USACE.

Public Transportation.

There are several mass transit systems within the metropolitan area. The Cities of Davenport and Bettendorf, Iowa, have mass transit departments (Davenport Citibus and Bettendorf Transit) that provide bus transit service within their city limits. The Rock Island County Metropolitan Mass Transit District (MetroLINK) provides public transportation throughout the Illinois portion of the metropolitan area. In addition, MuscaBus and Riverbend Transit, Inc., provide public transportation throughout Muscatine and Scott Counties, as well as neighboring Cedar and Clinton Counties.

All transit districts are interconnected through the Davenport Ground Transportation Center (GTC), which was completed in 1985 in downtown Davenport to provide consolidated passenger services for the area. Connections to both air and inter-city bus service are available at the Quad City International Airport. In addition, many buses are equipped with bicycle racks to encourage intermodal connections. Interstate bus service is provided by Greyhound Buslines in Davenport, Iowa, and Moline, Illinois.

4.10.2 Consequences

4.10.2.1 Proposed Action

As discussed in Section 4.9.2.1, a total of 149 military, 35 civilian, and 15 contractor personnel are expected to physically relocate to RIA under the proposed action. Although RIA would gain personnel under the proposed action, the installation is expected to experience a net loss of personnel from the combined effect of other BRAC and non-BRAC actions. As such, the proposed action, when coupled with other actions, is not expected to result in a permanent increase in personnel-related traffic at RIA. If the proposed action alone is considered, the increase in personnel-related traffic would not be significant and would be easily be accommodated by the existing transportation system of the installation.

Under the proposed action, the munitions functions being relocated from Riverbank AAP would increase the truck traffic to and from Building 299 for shipping raw materials to the building and shipping finished products from the building. The expected increase in truck traffic would be accommodated by the infrastructure in place. The increase in truck traffic could cause traffic congestion on some installation roads; however, it is not expected to create a significant burden on the installation road system because it would be intermittent and traffic could be rerouted to other parts of the road system as needed.

Construction work associated with the proposed remodeling of Buildings 68 and 299 would temporarily increase traffic at RIA during the construction period. The projected increase in traffic is not expected to significantly burden the road system in or around the installation. After the remodeling is completed, traffic levels in and around RIA would return to current levels. The proposed remodeling of Buildings 68 and 299 would not involve modifications to the existing road system at RIA. The proposed action is not expected to significantly affect rail services, air traffic, or public transportation.

For these reasons, the proposed action would have a negligible impact on transportation.

4.10.2.2 No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. Therefore, the no action alternative would have no effect on transportation.

4.11 Utilities

4.11.1 Affected Environment

4.11.1.1 Potable Water

The potable water system of RIA is independent of any outside facilities. The potable water is used by workers in the installation office buildings and factory, as well as by residents of the housing units located on the installation.

The RIA Water Treatment Plant (WTP) is contractor-operated under the direction of the Directorate of Public Works. Water is drawn from the Mississippi River and pumped via underground pipeline to the WTP. There, the water enters a rapid mix tank where alum, lime, chlorine, and ammonia are added. After this process, the water enters a flocculation chamber before moving on to a settling basin for filtration and on to the 750,000-gallon clear well. Here, the water is stored awaiting use or transport to the 500,000-gallon elevated storage tank. The current water storage capacity of RIA is in excess of 1.2 million gallons.

Distribution System.

The potable water distribution system at RIA was originally sized to serve a demand of approximately 2 million gallons per day (mgd): substantially greater than current demand. The distribution system comprises more than 130,000 linear feet (LF) of water mains and lateral water lines and a portion of the system contains older unlined cast iron mains. Water quality at RIA satisfies all applicable regulatory requirements.

Current Demand.

The plant currently operates at 800 gallons per minute (gpm) with a maximum daily production of 1.1 mgd. During the coldest winter months, a lower flow-through rate is required to allow for adequate contact time, whereas in warmer months the rate can be

increased to 1,200 gpm, or 1.7 mgd. At these rates, there exists approximately 1 mgd of excess capacity in the summer months, and 0.5 mgd of excess capacity during the winter months. Average usage levels for RIA for the last 2 years are shown in Table 4-6.

TABLE 4-6
Average Water Use Levels at RIA (gallons)
EA for Implementation of BRAC Actions at Rock Island Arsenal

Season	Average Daily Use	Minimum Daily Use	Maximum Daily Use	Monthly Total
FY2004	384	212	586	11,721
FY2005	526	346	718	16,021
FY2006	485	390	641	14,896
Winter	391	245	579	11,881
Summer	520	314	725	15,961

Typical summer average daily demand is about 0.5 million mgd and typical winter demand is about 0.4 mgd. In the last 2 years, there has been a slight increase in water usage, which is most likely due to an increase in mission workload at the Joint Manufacturing and Technology Center in support of war-related missions. Additionally, a significant drought occurred during the summer months of 2005. Despite these increases, the WTP still possesses significant excess capacity. The daily demand would have to be more than double before any modifications to the plant would be required.

Water for firefighting is provided through the non-potable fire protection loop. This system can be charged with water drawn directly from the Mississippi River. The combination of the potable system and the non-potable system allows RIA to provide adequate water for fire protection without any additional storage, beyond the current elevated storage tank and the clear well.

4.11.1.2 Wastewater System

Collection.

The initial sewage system at RIA was constructed, along with the original manufacturing shop buildings, during the post Civil War period (1865 to 1880), when no differentiation was made between stormwater drainage and sanitary sewage.

During the World War II construction period (1941 to 1945), differentiation was made between stormwater drainage and sanitary sewage, with the sanitary sewage transported to the City of Rock Island Wastewater Treatment Plant (WWTP) from the new buildings. In 1977, the RIA separated all storm and sanitary sewers which reduced the flow rate to the City of Rock Island WWTP substantially. Table 4-7 provides the historical peak daily and monthly flow rates for the period 1998 to 2004.

A review of the rainfall records and the Mississippi River stages reveals that peak flows in the sanitary sewer system occur during periods of heavy rainfall or when the Mississippi River is at or above flood stage. Mississippi River flood stages appear to have the greatest

impact on system flow. During these episodes, infiltration occurs primarily in the main trunk line along the southern side of the island and a few other places in the system, where the pipe is buried below flood level. The main trunk line was relined in 1998 to 2000, and infiltration was reduced substantially.

All areas of RIA are served by the system except the testing area at the eastern end of the island, the National Cemetery, Memorial Field, and two family houses on the northeastern side of the island. These areas are served by individual septic systems. All sewage collected by the main system is routed to the main pumping station (Building 204), from which it is pumped to the City of Rock Island sewage system for treatment and disposal.

Historically, industrial wastewater comprised approximately 6 percent of total wastewater. Industrial wastewater consisted of discharge from the plating shop waste treatment, boiler blowdown, water softener regeneration wastes, wash rack discharges, paint rack scrubber discharge, and once-through cooling water flows from industrial operations, all of which were discharged into the sanitary sewers.

In 1989, plating operations and the associated wastewater treatment system were relocated, resulting in improved handling of wastewater and reduced discharges. In the same time period, most once-through cooling systems were converted to closed systems and the paint booths were converted to a dry filter system and eliminated as a source of wastewater. These collective actions resulted in a decrease in the quantity of industrial wastewater generated on the installation.

TABLE 4-7
Sewage Flow Rates at RIA
EA for Implementation of BRAC Actions at Rock Island Arsenal

Year	Peak Daily Flow (gpd)	Peak Monthly Flow (gallons)
1998	2,657,000 (Apr)	336,171,000 (Apr)
1999	1,538,000 (Sept)	16,327,000 (May)
2000	1,377,000 (June)	17,480,000 (June)
2001	1,261,000 (Feb)	11,202,000 (Feb)
2002	1,554,000 (June)	13,778,000 (June)
2003	872,000 (Sept)	13,020,000 (May)
2004	1,510,000 (June)	21,336,000 (June)

Note:
gpd = gallons per day

Treatment

All wastewater from RIA is pumped to the City of Rock Island WWTP and is constantly monitored to assure compliance with license requirements.

All industrial wastewater, except from the plating shop, is discharged without treatment (except for oil/ grit separation in some cases) directly to the sanitary sewer. Plating shop

wastewater is treated in a facility in the plating shop and discharged to the sanitary sewer. The treated effluent must meet the pretreatment standards as defined in a license from the City of Rock Island. The flow volume from plating operations varies according to the workload in the shop. During 1991 to 1995, the plating shop discharged approximately 4 to 5 million gallons per year; in 2004 the shop discharged only 600,000 gallons.

4.11.1.3 Stormwater System

The developed areas of RIA have a storm drainage system that can accommodate current runoff during storm events. During normal river elevations, the entire drainage system is a gravity sewer with pipe sizes ranging from 12- to 48-inch diameter. Outlets to the system serving low-lying areas are provided with flood gates and five pump stations to prevent backflow onto RIA during high-water occurrences. Two of these pump stations are located on the western half of the island coincident with the more developed industrial, administrative, and supply/storage/warehouse areas.

Stormwater runoff from the coal pile associated with the central steam plant currently drains into the adjacent wooded area. The installation's *Stormwater Management Plan* monitors this area, as well as other sources of stormwater runoff associated with industrial activity. A proposed project for the construction of a new coal storage facility includes concrete storage bins to reduce runoff into this area.

In 1993, RIA experienced the highest flood event of the Mississippi River in the history of the installation. The river crested at 22.63 feet and threatened the island with high water for 5 weeks. The earthen levee along the northern shore of the island, as well as the installation's Flood Control Plan, prevented all but 25 acres of non-critical areas from being inundated with floodwater. Flood protection measures have been implemented, including the construction of earthen levees and floodwalls, that would provide protection to the installation under a 200-year flood event.

4.11.1.4 Energy Sources

Electrical System.

Supply

MidAmerican Energy Company is the main source of electric power for RIA. An additional source of power is provided by a contractor-operated hydroelectric plant located in Building 160 on the Sylvan Slough. A channel of the Mississippi River flows through this slough and drives 10 hydroelectric generating units located in the hydro plant building. Eight of these units were installed in 1917, with the last two being installed in 1995. A minor source of power is a single hydroelectric generator rated at 480 volts, 312 KVA located at Lock and Dam No. 15 on the northwestern corner of the island.

Distribution

The primary electric distribution system for RIA is fed from two 69 KV lines owned by MidAmerican. These two transmission lines are fed from MidAmerican Sub P (Moline) and Sub R (Rock Island) to MidAmerican Sub 30 located on RIA. From Sub 30, two 13.8 KV feeders are connected to RIA Substation A. Eleven 13.8 KV feeders leave Substation A and provide electric power to the majority of the installation. A portion of the western end of

RIA is fed directly from MidAmerican 13.8 KV distribution line and is not connected with the rest of the installation distribution system.

The 2,400-volt system (Delta) makes up the rest of the primary distribution system. The 2,400-volt feeders originate at the hydro plant and at two onsite substations. The 2,400-volt system is primarily underground to the main administrative and storage areas, and overhead to the outlying areas. A large portion of the underground circuits and duct system was installed from 1917 to 1940. A government-funded project has been initiated to replace the 2,400-volt portion of the distribution system. This project will upgrade the 2,400-volt system to 13.8 KV and will include underground distribution ducts and manholes, exterior pad mounted distribution transformers, distribution switches, and alteration of a substation for 13.8 KV service. A contractor provides operation and maintenance of the electrical generation and distribution system.

Backup/Emergency Systems

There is 2,621 KW of emergency generating capacity provided by diesel- and gasoline-powered generators on RIA. The purpose of emergency generation is to maintain operation of critical pieces of equipment during a power outage. Although the emergency power will not sustain any production, it will protect critical equipment.

The sewer lift station at Building 49 needs emergency power, because without emergency power, wastewater could back up into the housing area.

Electrical Power Consumption

In 2004, the peak installation demand was approximately 16,995 KW, of which 2,921 KW (17 percent) was generated at the hydroelectric plant. The total energy consumed by RIA in the same year was 70,344,000 KWH, of which 16,411 KWH (23 percent) was generated at the hydroelectric plant. Table 4-8 shows the peak power demand and total energy consumption for the period from 2000 to 2004.

TABLE 4-8

Historical Electrical Demand and Consumption at RIA
EA for Implementation of BRAC Actions at Rock Island Arsenal

Fiscal Year	Peak Demand (KW)	Total Consumption (KWHR)
2000	14,062	70,748,000
2001	15,920	71,486,000
2002	15,738	70,465,000
2003	14,651	68,544,000
2004	16,995	70,344,000

Electrical demand for RIA has continued to decrease over the last 20 years. The major cause for this decrease in demand was the implementation of an energy conservation program, and it is not anticipated that any additional primary feeds will be required in the foreseeable future.

Steam.

RIA generates its own steam year-round, which is used for manufacturing, heating, and air conditioning. The central steam plant (located in Building 227) is equipped with four coal-fired boilers (installed between 1941 and 1966) to produce steam for heating, cooling, and industrial purposes. A baghouse complex was installed in 1984 to control emissions of particulate matter. A private contractor operates the heating plant.

Distribution.

The steam distribution system has an average age of 50 years and is comprised of 5.5 miles of steam lines (4- to 12-inch diameter) with 4 miles of condensate return lines. The lines have more than adequate capacity to accommodate normal operations and downsizing is planned in areas that no longer support manufacturing.

Demand.

Annual coal consumption at the central steam plant has fluctuated little over the period 2000 through 2005 and averaged just over 23,000 tons. The highest coal use occurs in the winter months of November through March. Annual coal consumption has declined substantially over the last 20 years when the steam plant annually consumed more than 35,000 tons of coal. The reduction in coal consumption is the result of energy conservation efforts, a reduction in the manufacturing workload, and higher coal prices. The amount of coal on hand varies monthly, with a buildup in the fall toward a 5- to 6-month supply. It is desirable for RIA to store a full year's coal supply because all of the coal used is transported by barge. The Mississippi River usually freezes from December to March, thus eliminating coal delivery during this period. Water used for the production of steam is received from the domestic water supply and is further treated for softening prior to use in the boilers.

Steam will continue to be used for both process power and building heating and cooling in the future. It is not expected that the central steam distribution system will be extended to any additional outlying areas and steam requirements are limited to the areas now served by the central heating plant. Heating plant operations are scheduled to change from a 12-month year-round operation to an 8-month (mid-September to mid-May) operation in 2006.

Natural Gas.**Supply.**

Natural gas is supplied to RIA exclusively by MidAmerican Energy Company in a non-interruptible supply agreement. Gas is brought to the island via two pipelines beneath Sylvan Slough. Gas is supplied to RIA at 95 pounds per square inch (psi) and is stepped down to 30 psi prior to distribution.

Uses.

In 2005, total gas consumption was 31 million cubic feet (mcf) per year. Gas consumption has decreased significantly since 1980, when gas consumption totaled more than 45 mcf. The decrease is primarily due to onsite energy conservation efforts. In recent years, however, natural gas consumption has increased as a result of eliminating the use of fuel oil for heating and manufacturing processes, increases in factory workload to support wartime

missions, and higher costs of coal for steam production. Natural gas for heating declined between 2003 and 2004, when RIA converted 40 housing units to ground-source heat pumps. The natural gas consumption from 2001 to the first quarter of 2006 is shown in Table 4-9.

TABLE 4-9
Natural Gas Consumption at RIA
EA for Implementation of BRAC Actions at Rock Island Arsenal

Year	Consumption (MCF)
2001	36.9
2002	31.8
2003	38.0
2004	28.0
2005	31.0
2006 (1st Quarter)	11.5

It is anticipated that consumption of natural gas at RIA will rise substantially in the future for the following reasons: (i) the continued role of the arsenal in supporting wartime missions; and (ii) the conversion of coal fired boilers to natural gas boilers for process steam at the central steam plant. Based on the recent contractible amounts, there exists sufficient capacity in the supply system to allow for increased natural gas usage. However, the boiler conversion may require additional distribution system upgrades.

4.11.1.4 Solid Waste

Generators of solid waste at RIA include administrative offices, industrial shops, food services as well as plumbing, carpentry, grounds, roads, HVAC, and construction activities. Wastes generated are composed of the materials listed below.

Construction and Demolition (C&D) Waste: includes building materials, packaging, and rubble from construction, remodeling, repair, and demolition operations on pavements, houses, commercial buildings, and other structures. C&D waste includes masonry, wood, metals, plastics, paper, glass, brush, tree stumps, and miscellaneous fill material.

Municipal Solid Waste (MSW): includes residential and commercial solid waste that can be discarded in a sanitary landfill. MSW also includes most recyclable items.

Liquid Waste: composed of cutting and honing fluids with no more than 10 percent settled solids.

Industrial and Hazardous Waste: generated by industrial activities in the plating shop and manufacturing areas. Hazardous wastes are those that are ignitable, corrosive, reactive, and/or toxic. All other industrial wastes are non-hazardous/special wastes.

Yard Clippings: Yard clippings include leaves, grass, vegetables, shrubbery/brush/tree trimmings less than 4 feet in length and 2 inches in diameter that can be converted to

compost humus. Yard clippings do not include stumps, agricultural waste, animal waste, sewage sludge, or garbage.

Wood: includes tree branches, bark, lumber, pallets, wood chips, sawdust, or other wood or wood products, but does not include scrap wood, treated wood, painted wood, or any wood that has been contaminated during manufacture or use.

Solid waste is removed by private contractors and disposed of at landfill sites or treated and recycled. There is a recycling center onsite where recyclable materials are collected, packaged, and shipped to purchasers.

4.11.2 Consequences

4.11.2.1 Proposed Action

The proposed remodeling of Building 68 would involve minor modifications to the electrical system of the building. The remodeling of Building 299 would require new utility connections and/or upgrades to the existing utility system of the building, including electrical, steam, cooling water, compressed air, nitrogen, and natural gas. The relocation of the 1st U.S. Army into Building 68 is expected to slightly increase the energy consumption of the facility. The use of Building 299 for the production of artillery cartridge case metal parts being relocated from Riverbank AAP would moderately increase the overall energy consumption of the facility. The increase in energy demand would not overburden the utility infrastructure of RIA.

As discussed in Section 4.9.2.1, a total of 149 military, 35 civilian, and 15 contractor personnel are expected to physically relocate to RIA under the proposed action. Although RIA would gain personnel under the proposed action, the installation is expected to experience a net loss of personnel from the combined effect of other BRAC and non-BRAC actions. As such, the proposed action, when coupled with other actions, is not expected to increase potable water consumption or wastewater and solid waste generation at the installation. If the proposed action alone is considered, the increase in potable water consumption and wastewater and solid waste generation would not be significant and would be easily accommodated by the existing utility system of the installation.

For these reasons, the proposed action would have a negligible impact on utilities.

4.11.2.2 No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. Therefore, the no action alternative would have no effect on utilities.

4.12 Hazardous and Toxic Substances

4.12.1 Affected Environment

The RIA Environmental Management Office is responsible for the management of hazardous and toxic substances at RIA. RIA is designated as a large-quantity hazardous waste generator (i.e., more than 2,200 pounds), averaging nearly 13,000 pounds per month

that require disposal. Industrial and hazardous wastes are generally collected at their point of origin. If the wastes cannot be treated, they are packaged and transported to a central facility where they are stored temporarily (90 days or less) until removed by a licensed contractor and disposed of offsite.

At present, there are 7 active underground storage tanks (USTs) at RIA, which are used for gasoline (1), diesel fuel (2), used water-soluble cutting fluid (1), used oil (1), and as reserve for quench oil emergency fire suppressant (2). There are also many aboveground storage tanks (ASTs) used to store fuel for emergency power.

The RIA landfill has been inactive since 1965. The landfill is one of two active Installation Restoration Program (IRP) sites at RIA. The other active IRP site is the plume from a UST removal south of Building 250. RIA has one Military Munitions Response Program (MMRP) site, which is located in the northeastern corner of the island.

The RIA Spill Prevention, Control, and Countermeasures (SPCC) Plan and Installation Spill and RCRA Contingency Plan provides procedures for the proper handling of petroleum, oil, and lubricants (POL) and hazardous materials, as well as guidance on spill response and cleanup at the installation. The RIA Pollution Prevention Plan outlines practices to reduce the use of hazardous materials and to prevent pollutant releases. RIA also has a Pest Management Plan, Asbestos Management Plan, and Lead-based Paint Management Plan.

Hazardous and toxic substances are not used or stored in Building 68. POLs and common hazardous materials such as paints and solvents are used and stored in Building 299. The roof of Building 299 contains asbestos. It is currently being replaced with a non-asbestos containing, metal roof.

4.12.2 Consequences

4.12.2.1 Proposed Action

The 155 MM ICM artillery metal parts functions being relocated from Mississippi AAP involve storage only at RIA. The storage of these munitions at RIA would not generate any hazardous waste streams.

Some waste streams would be generated by the artillery cartridge case metal parts functions being relocated from Riverbank AAP. The expected production quantity for the incoming cartridge case metal parts functions is 5,000 parts per month. The various components of the production process would generate several types of hazardous waste, including zinc phosphates, salts, and hexchrome (hexavalent chromium). All hazardous waste generated by the production process would be handled, stored, and disposed in accordance with all applicable environmental regulations and with all hazardous materials management plans implemented at RIA. Wastewater from the production process would be discharged to the City of Rock Island WWTP. All wastewater associated with the production process, with the exception of the wastewater generated from hexchrome plating, would be discharged without treatment directly to the sanitary sewer system. As part of the proposed action, RIA would install a treatment system for hexchrome waste. The waste streams generated by the artillery cartridge case metal parts functions being relocated from Riverbank AAP would be constantly monitored for compliance with the Wastewater Discharge Permit (Permit No. 002) that governs RIA's discharges to the City of Rock Island WWTP. All pertinent

hazardous materials management plans implemented at RIA would be updated as needed to include the new wastes associated with the incoming munitions functions.

Under the proposed action, RIA would conduct a comprehensive asbestos survey of the portion of Building 299 proposed to be remodeled prior to any modifications. The roof of the facility is known to contain asbestos. Asbestos abatement would be conducted in accordance with NESHAP and all other applicable state and federal regulations. All waste manifests would be submitted to the government upon completion of the work.

For these reasons, any impacts associated with hazardous and toxic substances that the proposed action may have would be minor.

4.12.2.2 No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. Therefore, the no action alternative would have no effect on or from hazardous and toxic substances.

4.13 Cumulative Effects Summary

A “cumulative impact” is defined in 40 CFR 1508.7 as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.” Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

4.13.1 Proposed Action

The proposed remodeling of Buildings 68 and 299 would have little potential to interact with any past, present, or reasonably foreseeable future actions at or outside RIA. Operation of Building 68 by the 1st U.S. Army and of Building 299 for the incoming munitions functions would also have little potential to interact with other actions. The coupling of the proposed action with other BRAC and non-BRAC actions that are projected to involve RIA is not expected to significantly impact any resource evaluated in this EA.

Personnel relocations associated with the proposed action would increase the population in the ROI; however the population increase would represent a negligible proportion of the baseline population. Increases in resident population and demand for public services would be more than offset by other BRAC and non-BRAC actions that are projected to result in a decrease in population and public service demand in the ROI. When coupled with other BRAC and non-BRAC actions, the proposed action would not permanently increase traffic at RIA or increase potable water consumption or wastewater and solid waste generation at the installation.

The proposed action would have some minor positive cumulative effects on the local economy resulting from short-term, temporary increases in employment and expenditures during construction and from permanent relocation of personnel to the area. Because the proposed action would allow RIA to better accommodate the incoming munitions functions, it would have a positive cumulative effect on the mission of RIA and that of the U.S. Army.

4.13.2 No Action Alternative

Under the no action alternative, RIA would not remodel any of its facilities to accommodate the relocation of the 1st U.S. Army or munitions functions. Without remodeling its facilities, RIA would not be able to sufficiently comply with the Commission's recommendations. The inability of RIA to accommodate the 1st U.S. Army or incoming munitions functions has the potential to negatively affect other functions at RIA and result in adverse cumulative impacts on the overall mission of the installation and that of the U.S. Army.

5. Conclusions

Table 5-1 summarizes the consequences of the proposed action and the no action alternative.

5.1 Consequences of the Proposed Action

Any impacts that the proposed action may have on the natural environment would be temporary and negligible. During the proposed renovation of Buildings 68 and 299, there would be *de minimus* increases in air emissions from fugitive dust and construction vehicle exhaust emissions. The air emissions that would be generated by the production of artillery cartridge case metal parts being relocated from Riverbank AAP would cause *de minimus* impacts to air quality and are not expected to collectively exceed federal air quality thresholds. Construction-related noise would be temporary and the levels are expected to be negligible or not audible off post. Remodeling of the buildings would have minor impacts on topography and soils during construction. The soils around the buildings are already disturbed and no significant land contouring would be required. Sediment and erosion controls would be implemented during construction to prevent any indirect impacts to surrounding soils or surface waters. Construction activity that occurs on the building exteriors may have a minor, temporary impact on vegetation, which consists entirely of mowed grass and sparse landscaping vegetation. After construction is completed, any affected areas would be restored to original vegetative conditions. The establishment and operation of staging areas for the remodeling, as well as general construction noise, may temporarily disturb common wildlife species. The immediate areas around the buildings provide poor quality wildlife habitat because of they are mostly developed. Any disturbance experienced by wildlife would be limited to the construction period and is expected to be minimal.

The remodeling of Buildings 68 and 299 would not have a significant impact on the structural integrities of the buildings and would not diminish the historic value of the structures. The increase in personnel-related traffic from relocation of personnel would not be significant and would be easily be accommodated by the existing transportation system of the installation. The increase in truck traffic to and from Building 299 associated with the incoming munitions functions is not expected to create a significant burden on the installation road system because it would be intermittent and traffic could be rerouted to other parts of the road system as needed. The increase in construction-related traffic would be temporary and would return to current levels when remodeling is completed. All hazardous waste generated by the production process would be handled, stored, and disposed in accordance with all applicable environmental regulations and with all hazardous materials management plans implemented at RIA. As part of the proposed action, RIA would install a treatment system in Building 299 for hexchrome waste that would be generated by the production of artillery cartridge case metal parts. Generated wastewater would be monitored for compliance with the installation's Wastewater Discharge Permit. The asbestos abatement necessary for the remodeling of Building 299

TABLE 5-1
 Summary of Potential Environmental and Socioeconomic Consequences
EA for Implementation of BRAC Actions at Rock Island Arsenal

Resource	Environmental and Socioeconomic Consequences	
	No Action	Proposed Action
Land Use	No Effect	No Effect
Air Quality	No Effect	Negligible Impact <i>de minimus</i> construction-related fugitive dust and construction vehicle exhaust emissions would be controlled through appropriate BMPs. Air emissions from production of artillery cartridge case metal parts would cause <i>de minimus</i> impacts to air quality and are not expected to collectively exceed federal air quality thresholds.
Noise	No effect	Negligible Impact Construction-related noise would be temporary and the levels are expected to be negligible or not audible off post. Operation of renovated buildings would generate noise levels similar to those currently generated.
Geology and Soils		
Geology	No Effect	No Effect
Topography	No Effect	Negligible Impact Minor topographic alternation during construction. Significant land contouring would not be conducted.
Soils	No Effect	Negligible Impact Minor construction-related disturbance. Soils around the buildings are already disturbed. Sediment and erosion controls would be implemented during construction to prevent any indirect impacts to surrounding soils.
Prime Farmland	No Effect	No Effect

TABLE 5-1
 Summary of Potential Environmental and Socioeconomic Consequences
EA for Implementation of BRAC Actions at Rock Island Arsenal

Resource	Environmental and Socioeconomic Consequences	
	No Action	Proposed Action
Water Resources		
Surface Water	No Effect	Negligible Impact Sediment and erosion controls would be implemented during construction to prevent any indirect impacts to surrounding surface waters. Such controls may include silt fences, hay bales, and seeding of cleared areas that are to remain exposed for long periods of time.
Groundwater	No Effect	Negligible Impact Little or no groundwater dewatering is expected to be required during construction activities.
Floodplains	No Effect	No Effect
Wetlands	No Effect	No Effect
Biological Resources		
Vegetation	No Effect	Negligible Impact Minor, temporary impact from construction activity on building exteriors. Vegetation consists entirely of mowed grass and sparse landscaping vegetation. After construction is completed, any affected areas would be restored to original vegetative conditions.
Wildlife	No Effect	Negligible Impact Minor, temporary disturbance from staging areas and construction noise. The immediate areas around the buildings provide poor quality wildlife habitat because of they are mostly developed. Any disturbance would be limited to the construction period and is expected to be minimal.

TABLE 5-1
 Summary of Potential Environmental and Socioeconomic Consequences
EA for Implementation of BRAC Actions at Rock Island Arsenal

Resource	Environmental and Socioeconomic Consequences	
	No Action	Proposed Action
Sensitive Species	No Effect	No Effect
Migratory Birds	No Effect	No Effect
Cultural Resources	No Effect	Negligible Impact Remodeling would not have a significant impact on the structural integrities of the buildings and would not diminish the historic value of the structures. All work would be confined to existing building footprints or previously disturbed areas so archaeological or Native American resources would not be impacted.
Socioeconomics		
Economic Development	No Effect	Negligible Impact Short-term, positive impact on local economy from temporary increases in employment and expenditures during construction.
Demographics and Public Services	No Effect	Negligible Impact Small population increase resulting from personnel relocations. Population increase would represent a negligible proportion of baseline population within the ROI. . Increases in resident population and demand for public services would be more than offset by other BRAC and non-BRAC actions that are projected to result in a decrease in population and public service demand in the ROI.
Environmental Justice and Protection of Children	No Effect	No Effect

TABLE 5-1
 Summary of Potential Environmental and Socioeconomic Consequences
EA for Implementation of BRAC Actions at Rock Island Arsenal

Resource	Environmental and Socioeconomic Consequences	
	No Action	Proposed Action
Transportation	No Effect	<p>Negligible Impact</p> <p>Increase in personnel-related traffic from relocation of personnel would not be significant and would be easily be accommodated by the existing transportation system of the installation. Increase in truck traffic to and from Building 299 associated with the incoming munitions functions is not expected to create a significant burden on the installation road system because it would be intermittent and traffic could be rerouted to other parts of the road system as needed. Increase in construction-related traffic would be temporary and would return to current levels when remodeling is completed.</p>
Utilities	No Effect	<p>Negligible Impact</p> <p>Minor modifications to the utility infrastructure of the installation. Small increase in energy demand would not overburden the utility system. When coupled with other BRAC and non-BRAC actions, proposed action would not increase potable water consumption or wastewater and solid waste generation at the installation.</p>
Hazardous and Toxic Substances	No Effect	<p>Negligible Impact</p> <p>All hazardous waste generated by the production process would be handled, stored, and disposed in accordance with all applicable environmental regulations and with all hazardous materials management plans implemented at RIA. As part of the proposed action, RIA would install a treatment system in Building 299 for hexchrome waste that would be generated by the production of artillery cartridge case metal parts. Generated wastewater would be monitored for compliance with the installation's Wastewater Discharge Permit. Asbestos abatement necessary for the remodeling of Building 299 would be conducted in accordance with NESHAP and all other applicable state and federal regulations.</p>

TABLE 5-1
 Summary of Potential Environmental and Socioeconomic Consequences
EA for Implementation of BRAC Actions at Rock Island Arsenal

Resource	Environmental and Socioeconomic Consequences	
	No Action	Proposed Action
Cumulative Effects	<p>Negative Impact</p> <p>Without remodeling its facilities, RIA would not be able to sufficiently comply with the 2005 BRAC Commission's recommendations. The inability of RIA to accommodate the 1st U.S. Army or incoming munitions functions has the potential to negatively affect other functions at RIA and result in adverse cumulative impacts on the overall mission of the installation and that of the U.S. Army.</p>	<p>Positive Impact</p> <p>Proposed Action would have very little potential to interact with any past, present, or reasonably foreseeable future actions at or outside RIA. Short-term, positive cumulative impact on local economy from temporary increases in employment and expenditures during construction. Because the proposed action would allow RIA to better accommodate the incoming munitions functions, it would have a positive cumulative effect on the mission of RIA and that of the U.S. Army.</p>

Notes:

BMP = best management practice

ROI = region of influence

RIA = Rock Island Arsenal

BRAC = Base Realignment and Closure

NESHAP = National Emission Standards for Hazardous Air Pollutants

would be conducted in accordance with NESHAP and all other applicable state and federal regulations.

The remodeling and operation of the buildings would have little potential to interact with any past, present, or reasonably foreseeable future actions at or outside RIA. Personnel relocations associated with the proposed action would increase the population in the ROI; however, the population increase would represent a negligible proportion of the baseline population. Increases in resident population and demand for public services would be more than offset by other BRAC and non-BRAC actions that are projected to result in a decrease in population and public service demand in the ROI. When coupled with other BRAC and non-BRAC actions, the proposed action would not permanently increase traffic at RIA or increase potable water consumption or wastewater and solid waste generation at the installation. The proposed action would have some minor positive effects on the local economy resulting from short-term, temporary increases in employment and expenditures during construction.

5.2 Consequences of the No Action Alternative

The no action alternative would not result in any significant impacts to the resources evaluated in this EA. However, without remodeling its facilities, RIA would not be able to sufficiently comply with the 2005 BRAC Commission's recommendations. The inability of RIA to accommodate the 1st U.S. Army or incoming munitions functions has the potential to negatively affect other functions at RIA and result in adverse cumulative impacts on the overall mission of the installation and that of the U.S. Army.

5.3 Conclusions

Based on the findings of this EA, the proposed action would not result in significant adverse direct, indirect, or cumulative impacts to any environmental, cultural, physical, or socioeconomic resource. No mitigation measures have been determined to be necessary. Therefore, an EIS will not be prepared and a FNSI is warranted for the proposed action.

6. List of Preparers

Christopher Clayton/Senior Project Manager/25 years of experience/Ph.D.

Chuck Donaldson/Environmental Planner/11 years of experience/Bachelor of Science

Regi Getis/Word Processor/15 years of experience/Literary Arts

Tunch Orsoy/Project Manager/16 years of experience/Master of Science

Rich Reaves/Environmental Scientist/13 years of experience/Ph.D.

Russell Short/Senior Project Manager/28 years of experience/Master of Arts

Marian Stuart/Graphics Specialist/16 years of experience/Associate of Science

Charles Uhlarik/Project Manager/14 years of experience/Master of Science

Vicky Potter/Technical Editor/21 years of experience/Master of Arts

7. Distribution List

Cynthia Savoy/U.S. Army Corps of Engineers - Mobile District

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9. Persons Consulted

Steven Clark/RIA

Randy Covington/RIA

Chuck Gerdes/RIA

Norm Hatcher/RIA

Reita Kuster/RIA

Sharon Mathias/RIA

Anthony Mendes/Riverbank AAP

Alan Parris/RIA

Chuck Swynenberg/RIA

Rich Todd/RIA

10. Acronyms

AAP	Army Ammunition Plant
ADT	average daily traffic
AIRFA	American Indian Religious Freedom Act
ARPA	Archaeological Resources Protection Act
ASIP	Army Stationing and Installation Plan
AST	aboveground storage tank
BCC	Bird Species of Conservation Concern
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BMP	Best Management Practice
BRAC	Base Realignment and Closure
CAAPP	Clean Air Act Permit Program
C&D	construction and demolition
CEQ	Council on Environmental Quality
CERL	Construction Engineering Research Laboratory (U.S. Army)
CFR	Code of Federal Regulations
Commission	2005 BRAC Commission
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel level
DoD	U.S. Department of Defense
EA	Environmental Assessment
EIFS	Economic Impact Forecast System
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EO	Executive Order
EOC/JOC	Emergency Operations/Joint Operations Center
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FNSI	Finding of No Significant Impact
gpm	gallons per minute
GTC	ground transportation center
HAZMAT	hazardous materials
HQDA	Headquarters, Department of the Army
HVAC	heating, ventilation, and air conditioning
ICUZ	Installation Compatible Use Zone
ICM	Improved Conventional Munition
ICRMP	Integrated Cultural Resources Management Plan
IGPBS	Integrated Global Presence and Basing Strategy
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
ITS	Intelligent Transportation Systems
LCMC	Life Cycle Management Command

LF	linear feet
MBTA	Migratory Bird Treaty Act
mcf	million cubic feet
MetroLINK	Rock Island County Metropolitan Mass Transit District
mgd	million gallons per day
MFH	Military Family Housing
mgd	million gallons per day
µg/m ³	micrograms per cubic meter
MMRP	Military Munitions Response Program
mph	miles per hour
MSA	Metropolitan Statistical Area
msl	mean sea level
MSW	municipal solid waste
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OSHA	Occupational Safety and Health Agency
POL	petroleum, oil, and lubricants
psi	pounds per square inch
RCRA	Resource Conservation and Recovery Act
RIA	Rock Island Arsenal
ROI	Region of Influence
RTV	rational threshold value
SHPO	State Historic Preservation Office
SPCC	Spill Prevention, Control, and Countermeasures
SRT	Special Response Team
UPH	Unaccompanied Personnel Housing
UPS	uninterruptible power supply
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USDA	United States Department of Agriculture
UST	underground storage tank
vpd	vehicles per day
WTP	water treatment plant
WWTP	wastewater treatment plant

APPENDIX A

Agency Scoping



CH2MHILL

CH2M HILL
115 Perimeter Center Pl, NE
Suite 700
Atlanta, GA 30346

January 18, 2007

Mr. Richard Nelson
U.S. Fish & Wildlife Service
4469 48th Ave Court
Rock Island, Illinois 61201

NO OBJECTION
U.S. Fish & Wildlife Service
Rock Island, Illinois

J. Miller 1/23/07
SUPERVISOR

Subject: BRAC Environmental Assessment (EA) for Rock Island Arsenal, Illinois

Dear Mr. Nelson:

CH2M HILL is assisting Rock Island Arsenal (RIA) prepare an Environmental Assessment (EA) for the implementation of actions recommended under the 2002 Base Closure and Realignment law (commonly referred to as BRAC). Under the BRAC recommendations, Fort Gillem, Georgia, will be closed and the Headquarters of the 1st U.S. Army will be relocated to RIA. The Riverbank Army Ammunition Plant (AAP) in California will be closed and the artillery cartridge case metal parts functions will be relocated to RIA. Lastly, the Mississippi AAP in Mississippi will be closed and the 155MM Improved Conventional Munition (ICM) artillery metal parts functions will be relocated to RIA.

RIA proposes to remodel Building 68 to accommodate the relocation of the Headquarters of the 1st U.S. Army from Fort Gillem, Georgia, and to remodel Building 299 to accommodate the relocation of munitions functions from Riverbank AAP and Mississippi AAP.

Most of the construction activity for the remodeling of Buildings 68 and 299 would occur within the interiors of the buildings. The remaining activity would occur in the immediate developed areas just outside the buildings. These areas consist entirely of mowed grass and sparse landscaping vegetation and provide poor quality wildlife habitat. These areas are not expected to be utilized by any state or federally listed species. Any noise disturbance experienced by common wildlife species would be limited to the construction period and is expected to be minimal. For these reasons, the EA has concluded that the proposed action would have no effect on any state or federally listed species, migratory birds, or their habitats.

This letter is being sent as part of the agency scoping for the EA. Please submit any comments you have on the proposed action via letter correspondence or agency stamp to this letter to my attention within 30 days of receipt of this letter. Please contact me at (727) 698-8945 if you require further information.

Sincerely,

CH2M HILL

Tunch Orsoy

JAN 23 2007



CH2M HILL
115 Perimeter Center Pl, NE
Suite 700
Atlanta, GA 30346

January 18, 2007

Mr. Richard Nelson
U.S. Fish & Wildlife Service
4469 48th Ave Court
Rock Island, Illinois 61201

Subject: BRAC Environmental Assessment (EA) for Rock Island Arsenal, Illinois

Dear Mr. Nelson:

CH2M HILL is assisting Rock Island Arsenal (RIA) prepare an Environmental Assessment (EA) for the implementation of actions recommended under the 2002 Base Closure and Realignment law (commonly referred to as BRAC). Under the BRAC recommendations, Fort Gillem, Georgia, will be closed and the Headquarters of the 1st U.S. Army will be relocated to RIA. The Riverbank Army Ammunition Plant (AAP) in California will be closed and the artillery cartridge case metal parts functions will be relocated to RIA. Lastly, the Mississippi AAP in Mississippi will be closed and the 155MM Improved Conventional Munition (ICM) artillery metal parts functions will be relocated to RIA.

RIA proposes to remodel Building 68 to accommodate the relocation of the Headquarters of the 1st U.S. Army from Fort Gillem, Georgia, and to remodel Building 299 to accommodate the relocation of munitions functions from Riverbank AAP and Mississippi AAP.

Most of the construction activity for the remodeling of Buildings 68 and 299 would occur within the interiors of the buildings. The remaining activity would occur in the immediate developed areas just outside the buildings. These areas consist entirely of mowed grass and sparse landscaping vegetation and provide poor quality wildlife habitat. These areas are not expected to be utilized by any state or federally listed species. Any noise disturbance experienced by common wildlife species would be limited to the construction period and is expected to be minimal. For these reasons, the EA has concluded that the proposed action would have no effect on any state or federally listed species, migratory birds, or their habitats.

This letter is being sent as part of the agency scoping for the EA. Please submit any comments you have on the proposed action via letter correspondence or agency stamp to this letter to my attention within 30 days of receipt of this letter. Please contact me at (727) 698-8945 if you require further information.

Sincerely,

CH2M HILL

A handwritten signature in blue ink, appearing to read "T Orsoy".

Tunch Orsoy



DEPARTMENT OF THE ARMY
INSTALLATION MANAGEMENT AGENCY
HEADQUARTERS, UNITED STATES ARMY GARRISON - ROCK ISLAND ARSENAL
1 ROCK ISLAND ARSENAL
ROCK ISLAND, ILLINOIS 61299-5000

REPLY TO
ATTENTION OF:

05 JAN 2007

Office of the Garrison Manager

Mr. Pat Gleason
Illinois Historic Preservation Agency
Old State Capitol
Springfield, Illinois 62701

Dear Mr. Gleason:

As a result of actions recommended under the 2005 Base Closure and Realignment law (commonly referred to as BRAC), Fort Gillem, Georgia, will be closed and the Headquarters of the 1st US Army will be relocated to Rock Island Arsenal (RIA), Illinois. The Riverbank Army Ammunition Plant (AAP) in California will be closed and the artillery cartridge case metal parts functions will be relocated to RIA. Lastly, the Mississippi AAP in Mississippi will be closed and the 155 MM Improved Conventional Munitions (ICM) artillery metal parts functions will be relocated to RIA.

In support of these mandated BRAC actions RIA proposes to remodel Building 68 to accommodate the relocation of the Headquarters of the 1st U.S. Army, and to remodel Building 299 to accommodate the relocation of munitions functions from Riverbank AAP and Mississippi AAP.

It is proposed that the 1st US Army will occupy 2 ½ floors of Building 68. Structural modifications to the building are not anticipated. Remodeling of Building 68 will include modifications to the interior layout to provide Emergency Operations/Joint Operations Center (EOC/JOC), a command suite for General Officers, and five video teleconference rooms. The EOC/JOC will be equipped with an emergency generator and an uninterruptible power supply (UPS). Modifications will include upgrades to meet current force protection and anti-terrorism standards such as replacing windows and doors, as well as installing perimeter barriers and landscaping to meet required set-back distances from roadways and parking.

The remodeling of Building 299 will involve modifications to a portion of the building interior to provide space for the incoming munitions storage and production functions. The most significant structural modification that will be made will be raising one of the high bays approximately 20 feet to accommodate the equipment from Riverbank AAP. Other modifications will include constructing shop offices, restrooms, locker rooms, and shower facilities; modifying loading dock facilities; providing utilities such as electrical, steam, cooling water, compressed air, nitrogen, and natural gas to process equipment; and upgrading lighting and heating, ventilating, and air conditioning (HVAC) systems.

The BRAC process requires that an Environmental Assessment be developed for each action, at both the gaining and losing installations. Accordingly, a Draft Environmental Assessment for "Implementation of BRAC Actions at Rock Island Arsenal, Rock Island, Illinois" has been created,

outlining the potential affects of the proposed action on the environment of Rock Island Arsenal. As Cultural Resources fall within the framework of environmental concern, it is addressed in this draft. Completion of the EA is contingent on coordination with the State Historic Preservation Agency. With no design work having been accomplished, this office is limited at this time to providing a copy of the draft EA for your review. Recognizing that this does not follow the submittal documentation guidance for Section 106, it is being provided for informational purposes only. Although this will not provide the required level of coordination for Section 106 review, it will meet the National Environmental Policy Act (NEPA) requirement for notification of potential affects on the environment. It is the intention of this office to provide engineering drawings and specifications for your review and comment at such a time as they become available.

Building 68 is a Category 1 historic structure built in 1881. It is a contributing structure, and it is a part of the National Historic Landmark (NHL). Building 299 is a Category 3 historic structure built in 1942. It is a contributing structure, but it is not a part of the National Historic Landmark.

If you have any questions regarding this project, please contact Mr. Rich Todd, Civil Engineer, Engineering Services Division of Public Works, (309) 782-2193, E-mail: richard.e.todd@us.army.mil.

Sincerely,

A handwritten signature in black ink, appearing to read 'A. G. Wilson', with a stylized flourish at the end.

Alan G. Wilson
Garrison Manager

Enclosures

Draft Environmental Assessment

**Implementation of BRAC
Actions at Rock Island Arsenal,
Rock Island, Illinois**

Prepared for
U.S. Army Corps of Engineers

December 2006

CH2MHILL
Tampa, Florida

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APPENDIX B

Public Involvement

CERTIFICATE OF PUBLICATION

The undersigned, the MOLINE DISPATCH PUBLISHING COMPANY L.L.C., hereby certifies that it is a Limited Liability Company, existing and doing business under the laws of the State of Delaware, licensed to do business in the State of Illinois, and states that it is publisher of THE DISPATCH and THE ROCK ISLAND ARGUS daily, public, secular newspapers of general circulation printed and published daily in the City of Moline, County of Rock Island, State of Illinois, and further certifies that a notice whereof the annexed printed notice, a true copy, was printed and published in said newspapers, 1 time(s); that said notice was so printed and published in said newspaper 1 time(s) in each week for 1 successive week(s), the date of the first said newspaper containing said notice being the 12th day of APR A.D. 2007 and the last said newspaper containing said notice being the 12th day of APR A.D. 2007

Publication Fees \$42.16

STATE OF ILLINOIS } SS.
ROCK ISLAND COUNTY }

J. Scott Aswege being first duly sworn on his oath, says that he is the Business Manager of the MOLINE DISPATCH PUBLISHING COMPANY L.L.C. and the facts set forth in the foregoing certificate of publication are true and that the annexed notice was published as therein specified, and that said THE DISPATCH and THE ROCK ISLAND ARGUS have been regularly published in the City of Moline, County of Rock Island, and State of Illinois, for more than one year prior to the date of the first publication of said notice.

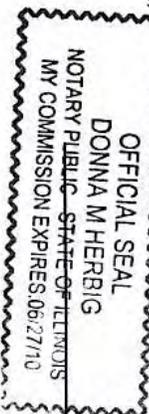
Subscribed and sworn to before me this 18 day of APR 2007
Account/Ad# 229177 461994
Account Name CH2M HILL

MOLINE DISPATCH PUBLISHING COMPANY L.L.C.

By

Moline, Illinois

04/18/2007



Notary Public

PUBLIC NOTICE

Rock Island Arsenal (RIA) has prepared an Environmental Assessment (EA) that evaluates potential environmental and socioeconomic impacts associated with implementation of Base Realignment and Closure (BRAC) requirements. Specific requirements involve the 1) relocation of the Headquarters of the 81st U.S. Army from Fort Gillem, Georgia to RIA, 2) relocation of artillery cartridge case metal parts functions from Riverbank Army Ammunition Plant (AAP) in California to RIA and 3) relocation of the 155 millimeter Improved Conventional Munition artillery metal parts functions from Mississippi AAP in Mississippi to RIA. The decision to proceed with the proposed activities is documented in a Draft Finding of No Significant Impact (FNSI). All interested persons are invited to submit written comments for consideration by RIA by 13 May 2007. Copies of the EA and Draft FNSI are available on the BRACD website at http://www.hqda.army.mil/acsim/bracenv_ea_review.htm, and at the Davenport Public Library, 321 Main St., Davenport, Iowa 52801 and at the Moline Public Library, 3210 41st St., Moline, Illinois 61265. Please direct any questions or comments to Mr. Chuck Swyrenberg, Environmental Coordinator, 1 Rock Island Arsenal, Building 102, Rock Island, Illinois 61299-5000. (309) 782-2445. charles.jee.swyrenberg@us.arm

COPY OF NOTICE
EXHIBIT "A"

AFFIDAVIT OF PUBLICATION

STATE OF IOWA }
SCOTT COUNTY, } SS.

The undersigned, being first duly sworn, on oath does say that he/she is an authorized employee of THE QUAD-CITY TIMES, morning edition, a daily newspaper printed and published by Lee Enterprises, Incorporated, in the City of Davenport, Scott County, Iowa, and that a notice, a printed copy of which is hereto annexed as Exhibit "A" and made a part of this affidavit, was published in said THE QUAD-CITY TIMES, on the following dates:

4-12-07

The affiant further deposes and says that all of the facts set forth in the foregoing affidavit are true as he/she verily believes.

J. Swindle

12th

day of _____ 20 07

Stephen H. Thor

Notary Public in and for Scott County, Iowa

STEPHEN H. THOR
Commission Number 168839
My Commission Expires 3-24-08

PUBLIC NOTICE
Rock Island Arsenal (RIA) has prepared an Environmental Assessment (EA) that evaluates potential environmental and socioeconomic impacts associated with implementation of Base Realignment And Closure (BRAC) requirements. Specifically, these requirements involve the 1) relocation of the Headquarters of the 1st U.S. Army from Fort Gillem, Georgia to RIA, 2) relocation of artillery cartridge case metal parts functions from Riverbank Army Ammunition Plant (AAP) in California to RIA and 3) relocation of the 155 millimeter Improved Conventional Munition artillery metal parts functions from Mississippi AAP in Mississippi to RIA. The decision to proceed with the proposed activities is documented in a Draft Finding of No Significant Impact (FNSI). All interested persons are invited to submit written comments for consideration by RIA by 13 May 2007. Copies of the EA and Draft FNSI are available on the BRACD website at http://www/hqda.army.mil/acsim/brac/erv_ea_review.htm, and at the Davenport, Public Library, 321 Main St., Davenport, Iowa 52801 and at the Moline Public Library, 3210 41st St., Moline, Illinois 61265. Please direct any questions or comments to Mr. Chuck Swynenberg, Environmental Coordinator, 1 Rock Island Arsenal, Building 102, Rock Island, Illinois 61299-5000. (309) 782-2445. charles.lae.swynenberg@us.army.mil

APPENDIX C

Results of EIFS Model

APPENDIX B

ECONOMIC IMPACT FORECAST SYSTEM

THE NEED FOR SOCIOECONOMIC IMPACT ASSESSMENT

Assessing socioeconomic impacts that result from Army actions can be one of the more controversial issues related to the realignment or closure of an installation. The economic and social well-being of a local community can be dependent upon the activities of the installation, and disruptions to the status quo can become politically charged and emotion-laden. The objective of a socioeconomic analysis of Army actions is an open, realistic, and documented assessment of the potential effects.

The requirement to assess socioeconomic impacts in environmental assessments (EAs) or environmental impact statements (EISs) has been a source of legal discussion since the passage of the National Environmental Policy Act (NEPA). Although NEPA is predominately oriented toward the biophysical environment, court decisions have supported the need for analyzing socioeconomic impacts when they are accompanied by biophysical impacts.

THE ECONOMIC IMPACT FORECAST SYSTEM

The U.S. Army developed the Economic Impact Forecast System (EIFS) with the assistance of many academic and professional economists and regional scientists to address the economic impacts pursuant to NEPA and to measure the significance of the impacts. As a result of its designed applicability, and in the interest of uniformity, the Assistant Secretary of the Army (Installations, Logistics, and Environment) (ASA [IL&E]) mandates using EIFS in the NEPA assessment of base realignment and closure recommendations. EIFS is designed for the scrutiny of a populace affected by the actions being studied. The algorithms in EIFS are simple and easy to understand, but still have firm, defensible bases in regional economic theory.

EIFS, in its current form, exists as a World Wide Web-based application. The application resides on a Web server hosted by the US Army Corps of Engineers, Mobile District. The EIFS model is available to U.S. government employees, contractors, and other people who have an approved login and password. Military planners, analysts and their contractors are authorized to access the EIFS application for the purpose of preparing the 2005 Base Realignment and Closure Act (BRAC) National Environmental Policy Act (NEPA) documentation.

As currently configured, EIFS provides:

- Selected statistics about the socioeconomic characteristics of any county or any multi-county area in the United States, including metropolitan statistical areas, and planning commission regions.
- An analytical process for estimating the magnitude and significance of potential socioeconomic effects of proposed military activities in these areas.

THE EIFS IMPACT MODEL

The basis of the EIFS analytical capabilities is the calculation of multipliers that are used for estimating the impacts resulting from Army-related changes in local expenditures and employment. In calculating the multipliers, EIFS uses the economic base model approach that relies on the ratio of total economic activity to “basic” economic activity. Basic, in this context, is defined as the production or employment engaged to supply goods and services outside the ROI or by federal activities (such as military installations and their employees). According to economic base theory, the ratio of total income to basic income is measurable (as the multiplier) and sufficiently stable so that future changes in economic activity can be forecast. This technique is especially appropriate for estimating “aggregate” impacts and makes the economic base model ideal for the EA/EIS process.

The multiplier is interpreted as the total impact on the economy of the region resulting from a unit change in its basic sector; for example, a dollar increase in local expenditures due to an expansion of a military installation. EIFS estimates its multipliers using a “location quotient” approach, which is based on the concentration of industries within the region relative to the industrial concentrations for the nation.

The EIFS model produces output that includes:

- Change in total sales by local businesses
- Change in total income
- Change in total employment
- Change in total population
- The significance of these changes

THE SIGNIFICANCE OF SOCIOECONOMIC IMPACTS

Once model projections are obtained, the rational threshold values (RTV) enable the user to evaluate the significance of the impacts. This analytical tool shows the historical trends for the defined region and develops measures of local historical fluctuations in sales volume, employment, income, and population. The evaluation identifies a range of positive and negative changes, within which a project can affect the local economy without creating a significant impact.

The techniques have two major strengths: (1) they are specific to the region under analysis and (2) they are based on actual historical time series data for the defined region. The use of the EIFS impact model in combination with the RTV has proven very successful in addressing perceived socioeconomic impacts. The EIFS model and the significance-measuring techniques are theoretically sound and have been reviewed on numerous occasions.

RTVs are positive and negative percent changes that establish an acceptable range around the maximum historic percentage fluctuations in the ROI. The average yearly decreases or increases in the ROI are obtained by analyzing regional data for the last 16 to 19 years, depending on data availability. For each variable (sales volume, employment, income, and population), the current time-series data available from the U.S. Bureau of Economic Analysis (BEA) for the ROI is used. The average annual change is calculated as the

difference between the first and last observations in the particular data set, divided by the number of years in the time series (see RTV tables, following). The maximum percent positive and negative deviations from that average are the basis for the RTVs.

Negative RTVs are percentages of the maximum negative deviations. These percentages are weighted to reflect the severity of potential impacts on individuals. Population changes are the most heavily weighted, at 50 percent, followed by employment and personal income changes (67 percent); changes in sales volume receive the least weight (75 percent). Using population as an example, if the greatest historic negative deviation from the annual average population change in the ROI was -0.952 percent, a population decrease of more than half of that (-0.476 percent) would be considered significant.

Positive RTVs represent the maximum positive historical fluctuation in the ROI, because of the generally positive connotations of economic growth. If the maximum historic positive deviation from annual average employment growth was 2.368 percent, an increase of more than 2.368 percent would be considered significant in the ROI.

Definitions

Change in Local Expenditures: Dollar value of expenditures for all services and supplies that are related to the action. This figure is entered by the user when the local purchases are not known. The system then computes an estimated value for the local purchases. Items supplied by General Services Administration (GSA) or Defense Logistics Agency (DLA) are not normally included in expenditures. A negative value is entered for a decrease in activity and a positive value is used if there is an expansion.

Change in Civilian Employment: Number of civilian personnel affected by the action. These are separated or newly added civilian employees. Personnel shifted from one position to another within the same geographic area should not be included. Enter a positive number for an increase or a negative number for a decrease.

Average Income of Affected Civilian Personnel: Average annual gross (before tax) income of civilian personnel affected by the action. Average income figures are entered as positive numbers. Income, in EIFS, is a broader concept than just the wages and salaries of employees. Consideration should also be given, if possible, to income earned from second jobs, working dependents, unearned income (i.e. interest, dividends, and rents), etc.

Percent of Civilians Expected To Relocate: The actual value will vary depending on work force composition and local availability of labor in the required skill categories. If the employees affected generally are clerical, professional, or highly skilled technical personnel, then it is likely that some of these workers will move to or from other geographic areas. If the action involves a large number of personnel, the proportion of those relocating is also likely to increase.

Change in Military Employment: Number of military personnel affected by the military action. These are the transferred (out of the region) or newly added military personnel. Personnel shifted from one position to another on post or within the same geographic area should not be included. Enter a positive number for an expansion or a negative number for a decrease.

Average Income of Affected Military Personnel: Average annual gross (before tax) income of all military personnel affected by the military action.

Percent of Military Living On-post: Percentage of affected military personnel residing on post.

Employment Multiplier: The export-employment multiplier based on the location quotient methodology.

Income Multiplier: The export-income multiplier based on the location quotient methodology.

Sales Volume – Direct: Direct change in business activity attributable to the military action. This represents the change in sales volume at local retail and wholesale service establishments where civilian and military personnel spend their wages and salaries and where local procurements are made. Housing expenditures are also included in this variable.

Sales Volume – Induced: Induced change in local business volume due to the military action. Defined as the difference between total change and direct change of local business volume.

Sales Volume – Total: Total change in local business volume due to the military action. Business volume is defined as local business activity or sales and is the sum of total retail and wholesale trade sales, total selected service receipts, and value added by manufacturing.

Employment – Direct: Direct change in local employment due to the military action. These are establishments that are initially affected by the military action.

Employment – Total: Total change in local employment due to the military action. This not only includes the direct and secondary changes in local employment, but also includes those military and civilian personnel who are initially affected by the military action.

Income – Direct: Direct change in local wages and salaries due to the military action. This is assumed to be earnings of the employees in local retail, wholesale, and service establishments that are initially affected by the military action.

Income – Total (place of work): Total change in local wages and salaries earned in the area due to the military action. This is the sum of the direct and secondary changes in wages and salaries plus the income of the civilian and military personnel affected by the military action.

Income – Total (place of residence): Total change in local personal income of residents due to the military action. This not only includes the direct and secondary changes in local personal income, adjusted for commuting patterns, but also includes the income of the civilian and military personnel initially affected by the military action.

EIFS REPORT

PROJECT NAME

RIA - Construction

STUDY AREA

17073 Henry, IL
17131 Mercer, IL
17161 Rock Island, IL
19139 Muscatine, IA
19163 Scott, IA

FORECAST INPUT

Change In Local Expenditures	\$11,640,000
Change In Civilian Employment	185
Average Income of Affected Civilian	\$42,180
Percent Expected to Relocate	0
Change In Military Employment	0
Average Income of Affected Military	\$0
Percent of Militart Living On-post	0

FORECAST OUTPUT

Employment Multiplier	3.73	
Income Multiplier	3.73	
Sales Volume - Direct	\$14,793,210	
Sales Volume - Induced	\$40,385,460	
Sales Volume - Total	\$55,178,670	0.29%
Income - Direct	\$9,228,120	
Income - Induced)	\$6,754,270	
Income - Total(place of work)	\$15,982,390	0.16%
Employment - Direct	250	
Employment - Induced	176	
Employment - Total	426	0.17%
Local Population	0	
Local Off-base Population	0	0%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	11.04 %	9.54 %	5.16 %	1.48 %
Negative RTV	-8.11 %	-8.04 %	-4.17 %	-0.87 %

RTV DETAILED

SALES VOLUME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	1293019	5650493	0	0	0
1970	1357749	5607504	-42989	-101034	-1.8
1971	1429506	5660844	53340	-4705	-0.08
1972	1571216	6017757	356913	298868	4.97
1973	1798276	6491776	474019	415974	6.41
1974	2070429	6728894	237118	179073	2.66
1975	2238815	6671669	-57226	-115271	-1.73
1976	2495160	7036351	364682	306637	4.36
1977	2794446	7377338	340987	282942	3.84
1978	3067197	7545305	167967	109922	1.46
1979	3474425	7678479	133175	75130	0.98
1980	3777029	7327436	-351043	-409088	-5.58
1981	4019536	7074383	-253053	-311098	-4.4
1982	3918194	6504202	-570181	-628226	-9.66
1983	3880060	6246897	-257305	-315350	-5.05
1984	4183056	6441906	195009	136964	2.13
1985	4345767	6475193	33287	-24758	-0.38
1986	4319305	6306185	-169007	-227052	-3.6
1987	4615540	7154087	847901	789856	11.04
1988	4785789	6508673	-645414	-703459	-10.81
1989	5038765	6500007	-8666	-66711	-1.03
1990	5355586	6587371	87364	29319	0.45
1991	5526707	6521514	-65857	-123902	-1.9
1992	5844151	6662332	140818	82773	1.24
1993	5939966	6593362	-68970	-127015	-1.93
1994	6222285	6720068	126706	68661	1.02
1995	6523977	6850176	130107	72062	1.05
1996	6838663	6975436	125261	67216	0.96
1997	7236753	7236753	261317	203272	2.81
1998	7660353	7507146	270393	212348	2.83
1999	7740221	7430612	-76534	-134579	-1.81

2000 8073054 7507940 77328 19283 0.26

INCOME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	1627843	7113674	0	0	0
1970	1724815	7123486	9812	-94315	-1.32
1971	1816908	7194956	71470	-32657	-0.45
1972	2000258	7660988	466032	361905	4.72
1973	2322176	8383055	722067	617940	7.37
1974	2609408	8480576	97521	-6606	-0.08
1975	2894390	8625282	144706	40579	0.47
1976	3147849	8876934	251652	147525	1.66
1977	3479699	9186406	309472	205345	2.24
1978	3850179	9471440	285035	180908	1.91
1979	4315026	9536208	64767	-39360	-0.41
1980	4705837	9129324	-406884	-511011	-5.6
1981	5249480	9239085	109761	5634	0.06
1982	5355371	8889916	-349169	-453296	-5.1
1983	5338632	8595198	-294718	-398845	-4.64
1984	5866623	9034599	439402	335275	3.71
1985	6099149	9087732	53133	-50994	-0.56
1986	6107334	8916708	-171024	-275151	-3.09
1987	6433845	9972459	1055752	951625	9.54
1988	6615192	8996661	-975798	-1079925	-12
1989	7091634	9148208	151546	47419	0.52
1990	7459862	9175630	27423	-76704	-0.84
1991	7730468	9121952	-53679	-157806	-1.73
1992	8185358	9331308	209356	105229	1.13
1993	8283148	9194294	-137014	-241141	-2.62
1994	8629472	9319830	125536	21409	0.23
1995	9042760	9494898	175067	70940	0.75
1996	9599973	9791972	297075	192948	1.97
1997	10133392	10133392	341420	237293	2.34
1998	10704315	10490229	356837	252710	2.41
1999	10703739	10275589	-214640	-318767	-3.1
2000	11231990	10445751	170162	66035	0.63

2000	8073054	7507940	77328	19283	0.26
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INCOME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	1627843	7113674	0	0	0
1970	1724815	7123486	9812	-94315	-1.32
1971	1816908	7194956	71470	-32657	-0.45
1972	2000258	7660988	466032	361905	4.72
1973	2322176	8383055	722067	617940	7.37
1974	2609408	8480576	97521	-6606	-0.08
1975	2894390	8625282	144706	40579	0.47
1976	3147849	8876934	251652	147525	1.66
1977	3479699	9186406	309472	205345	2.24
1978	3850179	9471440	285035	180908	1.91
1979	4315026	9536208	64767	-39360	-0.41
1980	4705837	9129324	-406884	-511011	-5.6
1981	5249480	9239085	109761	5634	0.06
1982	5355371	8889916	-349169	-453296	-5.1
1983	5338632	8595198	-294718	-398845	-4.64
1984	5866623	9034599	439402	335275	3.71
1985	6099149	9087732	53133	-50994	-0.56
1986	6107334	8916708	-171024	-275151	-3.09
1987	6433845	9972459	1055752	951625	9.54
1988	6615192	8996661	-975798	-1079925	-12
1989	7091634	9148208	151546	47419	0.52
1990	7459862	9175630	27423	-76704	-0.84
1991	7730468	9121952	-53679	-157806	-1.73
1992	8185358	9331308	209356	105229	1.13
1993	8283148	9194294	-137014	-241141	-2.62
1994	8629472	9319830	125536	21409	0.23
1995	9042760	9494898	175067	70940	0.75
1996	9599973	9791972	297075	192948	1.97
1997	10133392	10133392	341420	237293	2.34
1998	10704315	10490229	356837	252710	2.41
1999	10703739	10275589	-214640	-318767	-3.1
2000	11231990	10445751	170162	66035	0.63

POPULATION

Year	Value	Change	Deviation	%Deviation
1969	412666	0	0	0
1970	417093	4427	4274	1.02
1971	419154	2061	1908	0.46
1972	420126	972	819	0.19
1973	423036	2910	2757	0.65
1974	429554	6518	6365	1.48
1975	435873	6319	6166	1.41
1976	439082	3209	3056	0.7
1977	440677	1595	1442	0.33
1978	442770	2093	1940	0.44
1979	444097	1327	1174	0.26
1980	444988	891	738	0.17
1981	446162	1174	1021	0.23
1982	443428	-2734	-2887	-0.65
1983	438054	-5374	-5527	-1.26
1984	433754	-4300	-4453	-1.03
1985	427221	-6533	-6686	-1.56
1986	420062	-7159	-7312	-1.74
1987	413893	-6169	-6322	-1.53
1988	410204	-3689	-3842	-0.94
1989	408614	-1590	-1743	-0.43
1990	408285	-329	-482	-0.12
1991	411513	3228	3075	0.75
1992	414396	2883	2730	0.66
1993	415390	994	841	0.2
1994	415671	281	128	0.03
1995	416419	748	595	0.14
1996	415982	-437	-590	-0.14
1997	416286	304	151	0.04
1998	416966	680	527	0.13
1999	418265	1299	1146	0.27
2000	417566	-699	-852	-0.2

***** End of Report *****

EIFS REPORT

PROJECT NAME

RIA - Operations

STUDY AREA

17073 Henry, IL
17131 Mercer, IL
17161 Rock Island, IL
19139 Muscatine, IA
19163 Scott, IA

FORECAST INPUT

Change In Local Expenditures	\$0
Change In Civilian Employment	209
Average Income of Affected Civilian	\$54,500
Percent Expected to Relocate	25
Change In Military Employment	281
Average Income of Affected Military	\$55,920
Percent of Militart Living On-post	2

FORECAST OUTPUT

Employment Multiplier	3.73	
Income Multiplier	3.73	
Sales Volume - Direct	\$16,774,930	
Sales Volume - Induced	\$45,795,570	
Sales Volume - Total	\$62,570,500	0.33%
Income - Direct	\$27,104,020	
Income - Induced)	\$7,659,084	
Income - Total(place of work)	\$34,763,100	0.34%
Employment - Direct	563	
Employment - Induced	200	
Employment - Total	763	0.3%
Local Population	830	
Local Off-base Population	816	0.2%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	11.04 %	9.54 %	5.16 %	1.48 %
Negative RTV	-8.11 %	-8.04 %	-4.17 %	-0.87 %

RTV DETAILED

SALES VOLUME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	1293019	5650493	0	0	0
1970	1357749	5607504	-42989	-101034	-1.8
1971	1429506	5660844	53340	-4705	-0.08
1972	1571216	6017757	356913	298868	4.97
1973	1798276	6491776	474019	415974	6.41
1974	2070429	6728894	237118	179073	2.66
1975	2238815	6671669	-57226	-115271	-1.73
1976	2495160	7036351	364682	306637	4.36
1977	2794446	7377338	340987	282942	3.84
1978	3067197	7545305	167967	109922	1.46
1979	3474425	7678479	133175	75130	0.98
1980	3777029	7327436	-351043	-409088	-5.58
1981	4019536	7074383	-253053	-311098	-4.4
1982	3918194	6504202	-570181	-628226	-9.66
1983	3880060	6246897	-257305	-315350	-5.05
1984	4183056	6441906	195009	136964	2.13
1985	4345767	6475193	33287	-24758	-0.38
1986	4319305	6306185	-169007	-227052	-3.6
1987	4615540	7154087	847901	789856	11.04
1988	4785789	6508673	-645414	-703459	-10.81
1989	5038765	6500007	-8666	-66711	-1.03
1990	5355586	6587371	87364	29319	0.45
1991	5526707	6521514	-65857	-123902	-1.9
1992	5844151	6662332	140818	82773	1.24
1993	5939966	6593362	-68970	-127015	-1.93
1994	6222285	6720068	126706	68661	1.02
1995	6523977	6850176	130107	72062	1.05
1996	6838663	6975436	125261	67216	0.96
1997	7236753	7236753	261317	203272	2.81
1998	7660353	7507146	270393	212348	2.83
1999	7740221	7430612	-76534	-134579	-1.81
2000	8073054	7507940	77328	19283	0.26

INCOME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	1627843	7113674	0	0	0
1970	1724815	7123486	9812	-94315	-1.32
1971	1816908	7194956	71470	-32657	-0.45
1972	2000258	7660988	466032	361905	4.72
1973	2322176	8383055	722067	617940	7.37
1974	2609408	8480576	97521	-6606	-0.08
1975	2894390	8625282	144706	40579	0.47
1976	3147849	8876934	251652	147525	1.66
1977	3479699	9186406	309472	205345	2.24
1978	3850179	9471440	285035	180908	1.91
1979	4315026	9536208	64767	-39360	-0.41
1980	4705837	9129324	-406884	-511011	-5.6
1981	5249480	9239085	109761	5634	0.06
1982	5355371	8889916	-349169	-453296	-5.1
1983	5338632	8595198	-294718	-398845	-4.64
1984	5866623	9034599	439402	335275	3.71
1985	6099149	9087732	53133	-50994	-0.56
1986	6107334	8916708	-171024	-275151	-3.09
1987	6433845	9972459	1055752	951625	9.54
1988	6615192	8996661	-975798	-1079925	-12
1989	7091634	9148208	151546	47419	0.52
1990	7459862	9175630	27423	-76704	-0.84
1991	7730468	9121952	-53679	-157806	-1.73
1992	8185358	9331308	209356	105229	1.13
1993	8283148	9194294	-137014	-241141	-2.62
1994	8629472	9319830	125536	21409	0.23
1995	9042760	9494898	175067	70940	0.75
1996	9599973	9791972	297075	192948	1.97
1997	10133392	10133392	341420	237293	2.34
1998	10704315	10490229	356837	252710	2.41
1999	10703739	10275589	-214640	-318767	-3.1
2000	11231990	10445751	170162	66035	0.63

EMPLOYMENT

Year	Value	Change	Deviation	%Deviation
1969	188001	0	0	0
1970	186769	-1232	-3584	-1.92
1971	184929	-1840	-4192	-2.27
1972	189047	4118	1766	0.93
1973	201821	12774	10422	5.16
1974	213081	11260	8908	4.18
1975	212870	-211	-2563	-1.2
1976	216240	3370	1018	0.47
1977	220606	4366	2014	0.91
1978	223842	3236	884	0.39
1979	229502	5660	3308	1.44
1980	225988	-3514	-5866	-2.6
1981	225528	-460	-2812	-1.25
1982	214544	-10984	-13336	-6.22
1983	209594	-4950	-7302	-3.48
1984	214987	5393	3041	1.41
1985	215338	351	-2001	-0.93
1986	213090	-2248	-4600	-2.16
1987	215522	2432	80	0.04
1988	219543	4021	1669	0.76
1989	224661	5118	2766	1.23
1990	230084	5423	3071	1.33
1991	234014	3930	1578	0.67
1992	234410	396	-1956	-0.83
1993	233119	-1291	-3643	-1.56
1994	236661	3542	1190	0.5
1995	242117	5456	3104	1.28
1996	246735	4618	2266	0.92
1997	251743	5008	2656	1.06
1998	259607	7864	5512	2.12
1999	261157	1550	-802	-0.31
2000	263256	2099	-253	-0.1

POPULATION

Year	Value	Change	Deviation	%Deviation
1969	412666	0	0	0
1970	417093	4427	4274	1.02
1971	419154	2061	1908	0.46
1972	420126	972	819	0.19
1973	423036	2910	2757	0.65
1974	429554	6518	6365	1.48
1975	435873	6319	6166	1.41
1976	439082	3209	3056	0.7
1977	440677	1595	1442	0.33
1978	442770	2093	1940	0.44
1979	444097	1327	1174	0.26
1980	444988	891	738	0.17
1981	446162	1174	1021	0.23
1982	443428	-2734	-2887	-0.65
1983	438054	-5374	-5527	-1.26
1984	433754	-4300	-4453	-1.03
1985	427221	-6533	-6686	-1.56
1986	420062	-7159	-7312	-1.74
1987	413893	-6169	-6322	-1.53
1988	410204	-3689	-3842	-0.94
1989	408614	-1590	-1743	-0.43
1990	408285	-329	-482	-0.12
1991	411513	3228	3075	0.75
1992	414396	2883	2730	0.66
1993	415390	994	841	0.2
1994	415671	281	128	0.03
1995	416419	748	595	0.14
1996	415982	-437	-590	-0.14
1997	416286	304	151	0.04
1998	416966	680	527	0.13
1999	418265	1299	1146	0.27
2000	417566	-699	-852	-0.2

******* End of Report *******