

WORKING COPY DRAFT

**PROGRAMMATIC ENVIRONMENTAL ASSESSMENT
FOR RECOVERY ACTIVITIES
WORLD TRADE CENTER DISASTER
NEW YORK CITY, NEW YORK**

**FEDERAL EMERGENCY MANAGEMENT AGENCY
DR-1391**

January 24, 2002

PROGRAMMATIC ENVIRONMENTAL ASSESSMENT FOR RECOVERY ACTIVITIES WORLD TRADE CENTER DISASTER

NEW YORK CITY, NEW YORK

DRAFT TABLE OF CONTENTS

February 24, 2002

Section 1	Purpose and Need	1-1
1.1	Background	1-1
1.2	Overview	1-2
1.3	Purpose and Need	1-2
1.4	Scope of the Environmental Assessment	1-3
1.5	Decisions That Must Be Made	1-5
 Section 2	 Description of Proposed Actions and Alternatives	 2-1
2.1	Introduction and Background	2-1
2.2	Description of Alternatives	2-3
2.3	Description of Replacement Projects (Public Assistance)	2-4
2.3.1	Utilities	2-4
2.3.2	Roadways and Bridges	2-5
2.3.3	Eligible Buildings and Walkways	2-5
2.3.4	Parks, Green Space, and Landscape	2-6
2.3.5	Subways and Rail Systems	2-6
2.4	Hazard Mitigation Projects	2-6
2.4.1	Infrastructure and Critical Property Protection	2-7
2.4.2	Awareness Initiatives and Strategies to Protect the Public	2-8
2.4.3	Floodplain Management/Flood Hazard Reduction	2-10
 Section 3	 Affected Environment and Impacts	 3-1
3.1	Physical Resources	3-1
3.1.1	Topography, Geology and Soils	3-3
3.1.2	Climate and Air Quality	3-6
3.1.3	Water Resources	3-10
3.1.3.1	Floodplains and Floodplain Management EO 11988	3-12
3.1.3.2	Wetlands and Wetland Protection EO 11990	3-14
3.1.3.3	Groundwater	3-15
3.2	Biological Resources	3-16
3.2.1	Flora	3-16
3.2.2	Fauna	3-16

	3.2.3	Threatened and Endangered Species	3-18
	3.2.4	Critical Habitat.....	3-19
3.3		Transportation and Traffic	3-20
3.4		Noise	3-23
3.5		Cultural Resources	3-25
	3.5.1	Archaeological Resources.....	3-29
3.6		Socioeconomic Resources	3-30
	3.6.1	Land Use/Zoning	3-30
	3.6.2	Employment/Economic Base.....	3-33
	3.6.3	Utilities, Facilities and Services.....	3-37
	3.6.3.1	Health Care Services.....	3-38
	3.6.3.2	Water Supply	3-39
	3.6.3.3	Sanitary Sewer	3-40
	3.6.3.4	Energy	3-41
	3.6.3.5	Steam.....	3-41
	3.6.3.6	Natural Gas	3-41
	3.6.3.7	Solid Waste	3-42
	3.6.3.8	Telephone.....	3-42
	3.6.3.9	Police and Fire Protection.....	3-42
	3.6.3.10	Schools.....	3-43
	3.6.3.11	Parks and Recreation.....	3-44
	3.6.4	Aesthetics and Visual Resources	3-46
	3.6.5	Population	3-46
	3.6.6	Environmental Justice.....	3-50
	3.6.7	Executive Order 13045 Protection of Children	3-52
3.7		Safety	3-53
	3.7.1	Executive Order 12699 Seismic Safety.....	3-53
	3.7.2	Public Safety and Welfare	3-54
	3.7.3	Environmental Health	3-54
3.8		Hazardous Materials and Waste.....	3-56
	3.8.1	Demolition of Asbestos-Containing Material.....	3-59
	3.8.2	Demolition of Lead-Containing Materials.....	3-59
	3.8.3	Closure of Underground Storage Tank Sites	3-59
3.9		Cumulative Impacts	3-60
Section 4		Summary Mitigation and Permits.....	4-1
4.1		Compliance with Various Land-Use Policies and Controls	4-1
4.1.1		National Environmental Policy Act (42 USC 4321, et seq.)	4-1
4.1.2		Clean Air Act (42 USC 7401 et seq.)	4-1
4.1.3		Clean Water Act (33 USC 1251, et seq.) and Executive Order 11990-Protection of Wetlands	4-1
4.1.4		Rivers and Harbors Act of 1989 (33 USC 401 et seq.).....	4-2
4.1.5		Executive Order 11988 - Floodplain Management.....	4-2
4.1.6		Coastal Zone Management	4-2
4.1.7		Coastal Barrier Resources.....	4-2

4.1.8	Fish and Wildlife Coordination Act (16 USC 661 et seq.) and Endangered Species Act (16 USC 1531 et seq.)	4-2
4.1.9	Migratory Bird Treaty Act (16 USC Section 703 et seq.)	4-3
4.1.10	Federal Noxious Weed Act (7 USC 2801 et seq.) and the National Invasive Species Act of 1996 (16 USC 4701)	4-3
4.1.11	Local Land Use Plans	4-3
4.1.12	Administration of Environmental Policy	4-3
4.1.13	National Historic Preservation Act (16 USC 470 (f))	4-4
4.1.14	Prime and Unique Farmland Soils (7 USC 4201 et seq.)	4-4
4.1.15	Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq.)	4-4
4.1.16	Occupational Safety and Health Act of 1970 (PL 91-596)	4-4
4.1.17	Executive Order 13186 Migratory Bird Protection	4-4
4.2	Energy Requirements and Conservation Potential	4-5
4.3	Irreversible and Irretrievable Commitment of Resources	4-5
4.4	Relationship Between Local Short-Term Use of the Human Environment and Maintenance of Long-Term Productivity	4-5
4.5	Unavoidable Adverse Impacts	4-5
4.6	Means to Mitigate Adverse Environmental Impacts	4-6
4.7	Environmental Permits	4-6
Section 5	List of Preparers	5-1
Section 6	Bibliography	6-1
Section 7	Appendices	7-1

1.0 PURPOSE AND NEED

1.1 BACKGROUND

On Tuesday morning, September 11, 2001, terrorist attacks occurred in both New York City and the District of Columbia. In New York City, two hijacked planes crashed into the World Trade Center (WTC) complex located in lower Manhattan. The WTC complex was a seven building, 16-acre complex that included two 110-story office towers (North and South Towers), three smaller buildings, a United States Customs House, and a 22-story hotel. The WTC complex housed 430 companies from 28 countries, was the site of more than 40,000 jobs and was a stopping point for more than 150,000 daily visitors. The attack resulted in numerous fatalities and injuries. In the aftermath of the attack, three towers of the WTC (Buildings 1, 2 and 7) collapsed and Buildings 4, 5, and 6 partially collapsed. Many buildings and facilities in the vicinity of the WTC also sustained major damage including the following:

- No. 1 Liberty Plaza
- American Express Building,
- U.S. Custom House
- East River Savings Bank
- NJ Kallikow Financial Center
- South Bridge
- St. Nicholas Greek Orthodox Church
- 90 West Street
- Bankers Trust
- PATH tunnel and station
- Subways 1/9 and Cortlandt Street Station

Figure 1-1 provides a map of New York City and vicinity, *Figure 1-2* identifies Manhattan's land use patterns and *Figure 1-3* identifies the area of potential effect in lower Manhattan. In addition to the loss of life, the attack resulted in fires and explosions that extensively damaged infrastructure, buildings, bridges, roadways, streets, utility lines, subway stations and tunnels, walkways, parks, and city-owned equipment and vehicles. The collapse of the World Trade Center buildings and skyscrapers generated approximately 1.6 million cubic yards of debris (USACE 2001 and 2002).

To ensure a rapid recovery, the President declared by Proclamation a national emergency by reason of certain terrorist attacks pursuant to the National Emergencies Act (50 U.S.C. 1601 *et seq.*). On September 18, 2001, the national emergency Proclamation was published in the Federal Register (Federal Register Document [FR Doc.] 01-23358). The Federal Emergency Management Agency (FEMA) proposes to administer Federal disaster assistance pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law (P.L.) 93-288, as amended (the Act), and its implementing regulations found in Title 44, Code of Federal Regulations (CFR), Part 206 (Federal Disaster Assistance). There are amendments to this Proclamation that include the

stipulation that the entire states of New York and New Jersey are deemed national disaster areas and are designated FEMA Disaster Response (DR)-1391.

1.2 OVERVIEW

This draft Programmatic Environmental Assessment (PEA) has been prepared to comply with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Parts 1500 through 1508), and FEMA regulations for NEPA compliance (44 CFR Part 10). The Robert T. Stafford Disaster Relief and Emergency Assistance Act typically does not require full-blown NEPA analyses prior to funding approval in cases where restoration to pre-disaster conditions is contemplated. The circumstances surrounding the WTC disaster DR-1391 are deemed extraordinary and NEPA analyses are deemed necessary even though eligible projects may meet statutory or categorical exclusions defined by law. In accordance with NEPA and CEQ regulations, the goals and policies defined in NEPA have been integrated into up-front project planning so that environmental issues can be identified and considered during early project decision-making. FEMA and CEQ regulations encourage use of "tiering" whenever appropriate to eliminate repetitive discussions of issues and to focus on the actual issues pertinent for discussion at each level of environmental review. Tiering is accomplished through the preparation of a broadly focused PEA that discusses the impact of a projects or actions that are similar in action or location followed by more narrowly defined environmental studies concentrating on specific issues and specific projects, as necessary.

Although pertinent federal, state, and local laws, regulations, and ordinances were followed during the initial emergency response actions, this PEA does not address emergency response and recovery actions, such as debris recovery and disposal, interim utility line repair, traffic management, and overtime for government employees working to restore public services.

This draft PEA analyses the potential impacts related to federal projects that would repair or replace damaged infrastructure identified primarily during responsible party and stakeholder agency coordination initiated through work groups and subcommittees of the Federal Task Force to Rebuild New York City. Funding would be provided for DR-1391 recovery and hazard mitigation projects under two FEMA programs: the Public Assistance (PA) Program and Hazard Mitigation Grant Program (HMGP).

1.3 PURPOSE AND NEED

The proposed action is the restoration of the WTC site and related infrastructure to pre-disaster conditions in the area of impact in lower Manhattan. The proposed action includes projects developed to replace infrastructure as it had previously existed and to mitigate and prevent or minimize the effects of future terrorist attacks. The activities to restore and rebuild lower Manhattan to pre-disaster conditions would occur after the emergency response and recovery operations are concluded. In general, restoration would begin as soon as debris is removed and appropriate recovery planning is completed

in sufficient detail to allow for redevelopment to proceed. Restoration of the WTC site would incorporate in-depth studies performed in conjunction with master planning efforts, project design, and permitting prior to the implementation of construction. Hazard mitigation projects would also require detailed design prior to implementation.

The purpose of the proposed action is to repair or replace destroyed and damaged infrastructure in compliance with the directives of the Robert T. Stafford Disaster Relief and Emergency Assistance Act within the area of potential effect in lower Manhattan and to provide the opportunity for funding of hazard mitigation projects to control the threat of future terrorist attacks.

The need for the proposed action is to provide supplemental federal funds sufficient to allow timely disaster response actions so that the aftermath of this horrific national disaster can be expeditiously and efficiently managed and so that planning to minimize the threat of future terrorist attacks in the designated disaster area can occur.

The purpose of the PEA is to streamline the project review and approval process and expeditiously respond to requests for project-specific funding developed by the public assistance applicants. The objective of this PEA with respect to public assistance and hazard mitigation for the World Trade Center disaster is to repair or replace damaged public facilities and to reduce the risks of future terrorist actions. The objective of this draft PEA is also to identify the potential environmental impacts of disaster recovery activities related to construction so that the project approval process can be streamlined.

Based on project scoping, other objectives of this draft PEA are itemized below:

- To determine the environmental impacts of construction, recovery and mitigation projects proposed for the lower Manhattan impact area
- To identify applicable regulatory requirements and permits needed for construction projects in particular
- To involve the public, responsible agencies, and stakeholder corporations in the evaluation and project scoping process
- Establish baseline environmental conditions such as the square footage of building space damaged or destroyed; level of service of roadways and mass transit operations; and water, sewer, electrical requirements, footage of telephone lines and number of cables, volume of natural gas supplies necessary to establish impacts related to pre- and post-disaster use
- Identify opportunities and develop Memorandums of Agreement (MOUs), Programmatic Agreements, informal agency coordination initiatives, and to identify permit requirements appropriate to a programmatic-level analyses

1.4 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

There are no previous Environmental Assessments or Environmental Impact Statements that need to be integrated with, or influence the scope, of this PEA.

Issues addressed in detail by this PEA include floodplains, archeological and historic resource preservation threatened and endangered species protection, coastal zone management, noise, air quality, infrastructure requirements, environmental justice, and wetlands resources. The projects that would be reviewed by this draft PEA are limited to those that would likely be funded by FEMA under the Public Assistance or Hazard Mitigation Programs. The environmental analyses performed are limited to the recovery period, specifically the reconstruction period, for the impact area in lower Manhattan. The immediate area of potential impact for physical and biological resources and the area with proposed projects addressed by this PEA is along lower Manhattan, bounded by Chambers Street on the north, the Hudson River on the west, Rector Street on the south and Broadway on the east (*Figure 1-3*). In the vicinity of the area of potential impact, environmental resources such as historic structures, water quality, infrastructure, are addressed in appropriate detail below. The impact analyses are limited to the construction period since anticipated project impacts would not be expected to occur during the facility maintenance or operation periods.

Through scoping, the following issues have been identified:

- How would planned reconstruction or restoration activities reuse existing resources and services?
- How would activities directed at restoring damaged infrastructure and services affect other resources and issues?
- What ecological or socioeconomic change would occur in the disaster area as a result of proposed restoration activities?
- How would restoration activities affect land uses, local economies, and communities?
- How would any threatened and endangered species be impacted by redevelopment or restoration actions?
- What changes would occur as a result of restoration or reconstruction activities?
- How would worker safety impacts associated with facility construction and operation be managed?
- What displacement or relocation impacts of businesses, residents, and travel-related resources would occur?
- What are the potential impacts to floodplains, migratory bird species, and historic, cultural and archeological resources?
- What would the potential impacts be during construction on air quality, noise, water quality, Combined Sewer Overflow (CSO) System, soils, shallow groundwater, the Hudson River slurry wall, existing water and wastewater services?
- What effects would be incurred during the construction period on neighborhood schools, hospitals, libraries, museums, and other sensitive receptors (noise and air quality)?
- How would compliance with regulatory laws, statutes, programs, regulations, building codes, local ordinances, and Executive Orders be achieved and managed?

- Hazard mitigation programs and opportunities include the following: seismic safety, terrorist attack prevention, hurricane and flood mitigation, energy efficiency, Americans with Disabilities Act (ADA) compliance.
- How would hazardous waste, solid waste and regulated materials generated or encountered during the construction period be managed?
- How would storm water, groundwater, and soil erosion be managed during construction?
- How would traffic and business travel be managed during the construction period?
- How would police and fire protection service response times be affected by traffic conditions in lower Manhattan during and after site restoration construction?

The analyses performed by this PEA are based on review of scientific literature, consultation with regulatory agencies, and expert opinion. If the level of analysis in the PEA is insufficient for a specific project submitted for funding, then additional analysis would be tiered off this PEA, in accordance with 40 CFR Part 1508.28. Cumulative impacts, defined as project effects that are greater in significance than the sum of the direct and indirect effects when combined with the total effects of other actions, are addressed qualitatively in this PEA, based on similar projects within or near the study area developed or reviewed by federal agencies. Cumulative impacts would be considered when determining the compatibility of the findings of the PEA and NEPA compliance for specific projects identified after the publication of the PEA and Programmatic Finding of No Significant Impact (FONSI).

1.5 DECISIONS THAT MUST BE MADE

The PEA process would assist FEMA in determining whether projects submitted by the applicant meet the requirements of NEPA and the FEMA funding approval process. As an example, the applicant must meet all federal, state and local environmental laws, Executive Orders, regulations, codes, standards, requirements, and consistency reviews.

FEMA has determined that many projects eligible for funding in the localized WTC impact area would likely contain similar and typical project activities or elements such as excavation, tunneling, storm water management, construction equipment use, dewatering, debris disposal, placement and installation of building and facility support structures, health and safety of construction workers, and solid and hazardous materials management. Proposed actions that share similar mechanisms, intensities, locations and resultant potential impact, can be evaluated by this PEA so that NEPA compliance prior to funding approval are demonstrated for the majority of reasonably foreseen actions. A Programmatic FONSI would be executed for the typical actions covered by this PEA that would not result in significant impacts.

After projects are submitted for funding, FEMA would review the documentation provided by the applicant and a project memorandum would be prepared. This memorandum would identify whether the PEA and PEA FONSI adequately address NEPA compliance. FEMA would decide whether the PEA adequately addresses the

proposed action of specific individual projects, both large- and small-scale, and whether additional NEPA documentation is required. In most cases, it is expected that the memorandum would state that the project, alternatives, potential impacts, and mitigation activities were reviewed and found to be fully and accurately described by the PEA and the PEA FONSI. In these cases, the project memorandum would recommend that no further documentation would be required to comply with NEPA prior to project funding authorization. *Figure 1-4* is a project flowchart that describes the FEMA review and NEPA compliance process.

If this PEA does not adequately address a specific project proposed for funding, or if cumulative impacts are deemed significant, then the applicant must prepare supplemental environmental documents. The CEQ regulations recognize and encourage the use of such tiering environmental analyses. This PEA is a forward-thinking, broadly focused document that discusses the impacts of wide-ranging or long-term programs that would be followed, if necessary, by more narrowly defined environmental studies concentrating on specific issues and specific projects. The PEA would help expedite the funding approval process and expedite NEPA compliance to the benefit of the applicant. In some cases, a Supplemental Environmental Assessment (SEA) and a corresponding FONSI would be issued to address projects not adequately addressed by this PEA. Other projects may result in significant impacts or cumulative impacts and an Environmental Impact Statement may need to be prepared. These decisions would be made by FEMA upon review of individual project proposed for funding; memoranda to the files addressing sufficiency of NEPA documentation would be developed for each project submitted for funding.

In most disaster situations, NEPA compliance for projects that focus on recovery and restoration are addressed in part through the use of Statutory Exclusions (STATEXs) and Categorical Exclusions (CATEXs) identified by the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Typical examples of CATEXs for PA and HMGP projects include:

- acquisition of properties and associated demolition or removal of structures when the action has a willing seller, a buyer who coordinated with affected authorities, and a deed restriction that the acquired property remains as open space use in perpetuity
- physical relocation of individual structures where FEMA has no involvement in relocation, site selection, or redevelopment
- repair, reconstruction, restoration, elevation, retrofitting, upgrading, or replacement of a facility in a manner that substantially conforms to the pre-disaster design, function, and location.

Extraordinary conditions have been identified for FEMA DR-1391. As a result, this draft PEA would address conditions that are typically addressed under a CATEX or STATEX for both PA and HMGP projects located in the area of potential effect. The PEA would also serve to assist with the project definition stage, allowing applicants the opportunity to engage in upfront project development and impact avoidance and minimization.

Usually, by the time a project is submitted for FEMA funding approval, there has been a great deal of effort involved in planning and permitting and the project has already been defined. This means that costs, as well as some potential impacts, have been determined and alternatives have been identified and discarded. Through the NEPA process, and as part of the extraordinary circumstances of DR-1391, FEMA has been involved with the Environmental Planning and Review Subcommittee to develop plans for environmental streamlining the long-term recovery efforts. The multi-purpose PEA would help facilitate alternative development for both PA and HMGP projects located within the area of potential effect, capturing redevelopment alternatives identified during interagency planning sessions, and would also provide a mechanism for project scoping, public involvement and agency coordination.

2.0 DESCRIPTION OF PROPOSED ACTIONS AND ALTERNATIVES

2.1 INTRODUCTION AND BACKGROUND

Facilities, roadways, pedestrian and street bridges, parks, subways, terminals, and utilities would be constructed, installed, replaced, or renovated or restored during implementation of the proposed action alternatives. Dredging of sediment around piers may be necessary to facilitate water-transport of necessary equipment, ferries, and construction-related materials. Construction activities would generate direct impacts generally associated with the following operations:

- Performance of planning studies, obtaining permits, establishing laydown yards, pre-excavation clearances (buried hazard identification and archeological resource investigation), vibration, noise, air emission, and tunnel management, traffic control, health and safety planning
- Clearing, grading (site preparation), removal of surface cover and existing underground utilities, excavation management (shoring, etc.)
- Stockpiling materials and excavated soils, establishing site security and access, implementation of tunneling and vibration control plans
- Shipping and trucking construction materials to the site, managing construction and demolition waste, managing special and hazardous wastes
- Mixing of concrete, providing fuel (low-sulfur diesel, gasoline) for on-site equipment
- Traffic control and mass transport management; dredging and support facility construction
- Storing construction-related materials (examples: steel girders, supports, paints; lumber; steel beams; electrical wiring; sheet rock; floor tiles; ceiling tiles; glass; and, construction-related materials such as nails, bolts, nails, staples, etc.)
- Managing sanitary and solid waste; managing stormwater and pollution prevention planning; excavation, dewatering and wastewater disposal; tunneling, vibration, building and street support, and noise controls.

Because of the nature of this disaster, there are likely to be a number of proposed projects that would be related to the urban setting and opportunity to implement strategies to counter future acts against homeland security. Consequently, there is an identified need to develop new policies for identification and implementation of such actions, as well as a process to integrate the delivery of FEMA's recovery programs. It should be noted that the level of funding available for each project is highly variable depending on the type of program, project location, and other circumstances and contingencies. Funding may be specific to individual projects and programs. Projects identified are described independent of the source of funding although a brief summary of potential funding sources is provided in the following paragraphs to serve as an overview or introduction to the complex subject of funding mechanisms.

The Department of Defense Appropriations Bill (Public Law [P.L.] 107-117) was signed by the President of the United States on January 10, 2002 and transfers funds from the emergency appropriations passed in September 2001 for response to World Trade Center disaster.

The following is a partial and initial list of federal agencies that would be administering funds that may be used for reimbursement of disaster related costs incurred by eligible applicants to the FEMA Public Assistance Program.

Department of Justice:

- \$10 million (prior year funds)
- \$71.8 million law enforcement reimbursements a.k.a., "Byrne Grants"

Department of Commerce:

- \$8.25 million for "Public Telecommunications Facilities"

Small Business Administration:

- \$75 million for business loans under Section 203
- \$75 million for disaster loans under Section 202

Department of Labor:

- \$32.5 million for training and employment services
- \$125 million to the New York Workers Compensation Review Board
- \$25 million to the New York State Uninsured Employers Fund
- \$25 million to the New York State Uninsured Employers Fund, "for reimbursement of claims related to the first response emergency services personnel who were injured, were disabled, or died due to the terrorist attacks."

Department of Health and Human Services:

- \$140 million for grants to "public entities, not-for-profit entities, and Medicare and Medicaid enrolled suppliers and institutional providers to reimburse for health care related expenses or lost revenues..."
- Department of Education:
- \$10 million to local educational agencies

Department of Transportation:

- \$94.8 million "for competitive grants to critical national seaports to finance the costs of enhancing facility and operational security:"
- \$175 million "for a portion of the costs associated with new, additional or revised security requirements imposed on airport operators..."
- \$100 million for "the operation and construction of ferries and ferry facilities" Federal Highway Administration (FHWA)
- \$75 million for Emergency Relief Fund (administered by the FHWA)

- \$100 million for “Capital Investment Grants” for “transit agencies most severely impacted by the terrorist attacks...” (administered by the Federal Transit Authority)

Department of Housing and Urban Development:

- \$2 billion for Lower Manhattan Redevelopment Corporation

This PEA does not evaluate a number of the on-going emergency actions that have been covered under FEMA statutory exclusions and which have received emergency permits from the applicable regulatory agencies, including the Army Corps of Engineers and U.S. Fish and Wildlife Service. These actions include the massive debris removal effort that is estimated to encompass over 1.6 million tons (cubic yards) of debris and approximately a 1 year of effort to completely remove the remains of the destroyed buildings and their contents. The debris disposal is taking place at the Staten Island Landfill and is being monitored by the New York State Department of Environmental Conservation (NYSDEC). In addition, several areas have been dredged to allow for debris removal operations (barge access) and for temporary ferry service necessitated by the loss of the subway and PATH train access to lower Manhattan. The dredging operations were permitted by the USACE and dredged material is being deposited at the Newark Bay Confined Disposal Facility (CDF) in Newark, New Jersey.

2.2 DESCRIPTION OF ALTERNATIVES

The actions evaluated in this PEA reflect the complete destruction of several of the World Trade Center buildings, substantial damage to adjacent buildings, and massive damage to the roads, utilities, subway, and the underground PATH train infrastructure in the vicinity of the collapsed buildings. Consequently, emergency activities have served to protect lives, remove debris, and to restore utility services lost on September 11, 2001. It is anticipated that while the majority of actions would entail the repair or replacement in kind of damaged facilities and infrastructure, there may be opportunities to incorporate upgrades and hazard mitigation components into projects. The area of study with community board boundaries is represented by *Figure 1-3*. In addition, emergency transportation measures have and would need to be taken to provide critical access for people who live work and visit the WTC vicinity.

The proposed action is typically the alternative that has been proposed by the applicant/grantee as their preferred alternative. The purpose of this section is to list and describe the proposed actions in detail adequate to develop accurate assessments of potential impacts described in *Section 3.0*, and to provide a boundary of application of this PEA (future projects outside of these listed projects or assumed scope would require additional study). These alternatives do not provide site-specific project details, but rather describe a typical application of each alternative. A detailed, site-specific discussion of the proposed action and alternatives would be provided in each project specific Supplemental Environmental Assessment (SEA).

The alternatives rely on the knowledge and experience of the local agency to determine which projects are best suited to New York City's requirements and preferences. Proposed actions and alternatives have been designed by applicants/grantees to meet specific needs at the project areas. FEMA encourages applicants/grantees to solicit assistance from local specialized engineers, counter-terrorism planning experts, and other scientists when designing alternatives. Once alternatives are developed, Federal and State agency coordination to assist in identifying resources at specific sites and determine impacts to those resources is required as a part of each SEA.

There are several important clarifications regarding the scope of alternatives evaluated in this documents:

- The proposed actions evaluated in this document focus on interim repairs and recovery projects. The PEA accommodates long-term and large-scale projects such as reconstruction of major buildings/facilities, realignment of subways tunnels, and mitigation actions not in the vicinity of the impacted area; however, these actions may require additional NEPA review.
- The projects evaluated by this PEA focus on the World Trade Center site and surrounding areas of lower Manhattan. Although projects may be identified in the other New York City boroughs, these would require additional NEPA review beyond the scope of this document based on substantially different resource issues in those areas not covered in this document.

The following describes the alternatives are covered by this PEA.

2.3 DESCRIPTION OF REPLACEMENT PROJECTS

2.3.1 Utilities

No Action Alternative

Under the No Action Alternative, no FEMA funds would be made available to restoration of utilities. If local governments were unable to implement the proposed actions without Federal assistance, continued lack of services would continue, and economic impacts would become increasingly severe for the businesses and residents of the impacted area.

Proposed Action Alternative

The Proposed Action consists of several methods to restore utility services to the area. The primary utilities impacted include water mains, sewer lines, natural gas, steam, fuel oil, electric, and telephone lines. Based on the ownership issues in New York City, coordination is required to take place to allow for road cuts and to allow for work on multiple utilities to occur simultaneously in one area. The primary alternatives for any work related to utilities would include:

- Repair or reconstruction in place to pre-existing conditions (may include different materials but substantially the same size and alignment as before).
- Repair or replacement in place, with upgrades or improvements made (i.e. increased size of sewer piping).
- Replacement of utility along an alignment different from pre-disaster alignment.

2.3.2 Roadways and Bridges

No Action Alternative

Under the No Action Alternative, no FEMA funds would be made available to rebuild damaged roadways or bridges. Area roadways would remain in poor condition, including damage incurred in the disaster and those that have been impacted due to the heavy equipment use in the debris disposal operations. Traffic and transit congestion would continue to be a major issue in the lower half of Manhattan, with ripple effects to New Jersey where a substantial number of commuters originate.

Proposed Action Alternative

Projects related to roads would include repair of existing roads, incorporating existing standards. Projects would be funded under FEMA's PA program and other programs, such as those administered under the Federal Highway Administration (FHWA) Program Funding. It is anticipated that road alignments would not be changed based upon the already well-defined road grid system of lower Manhattan.

Roadway design changes and construction for the redevelopment of the WTC site may require additional review if the roadway alignments were substantively changed.

2.3.3 Eligible Buildings and Walkways

No Action Alternative

Under the No Action Alternative, no FEMA funds would be made available to rebuild damaged buildings and walkways. The State and City would be required to use their own resources to rebuild the impacted area and buildings.

Proposed Action Alternative

Under the Proposed Action Alternative, funding would be provided for those buildings and walkways eligible for repair or reconstruction. For those buildings that are eligible, there are several potential actions:

- Repair or replace the building in place to substantially pre-disaster conditions.
- Repair or replace the building in place but with substantial improvements (i.e. an additional wing, increased parking).
- Replace the building in a different location.

2.3.4 Parks, Green Space, and Landscape

No Action Alternative

Under the No Action Alternative, no federal funding would be made available for repair or replacement of damage to parks, green space, or landscaping.

Proposed Action Alternative

Under the Proposed Action Alternative, damage to parks, landscaping, and open spaces that are eligible for funding would be repaired or replaced.

2.3.5 Subways and Rail Systems

No Action Alternative

Under the No Action Alternative, no federal funding would be made available for repair or replacement of damaged subway or rail tunnels, tracks, stations, and related infrastructure and equipment. This would likely delay the resumption of normal commuter service to the area.

Proposed Action Alternative

Under the Proposed Action Alternative, federal funding would be made available to repair or replace damage to the subway and train systems. There are several alternatives for projects related to subway and rail, including:

- Repair or replacement of rail and subway facilities to substantially pre-disaster conditions.
- Repair or replacement of rail and subway facilities in pre-disaster alignments, but with substantial changes (i.e. increased size of tunnels or stations).
- Replacement of rail and subway facilities in a different alignment.

2.4 HAZARD MITIGATION PROJECTS

Hazard mitigation is any sustained action taken to reduce or eliminate long-term risk to people and property from natural or manmade hazards and their effects. FEMA provides the opportunity for communities to mitigate against hazards by providing mitigation grant funding through both the 406 Public Assistance (PA) program and the 404 Hazard Mitigation Grant Program (HMGP). A key purpose of the HMGP and the PA 406 mitigation program is to ensure that the opportunity to take critical mitigation measures is not lost during the recovery and reconstruction process following a disaster.

Accordingly, projects that would protect infrastructure and systems essential to the continued viability of a community are given consideration. To the maximum extent practicable, mitigation measures should address multiple hazards and attempt to be multi-objective in scope.

The key difference between the two mitigation grant programs (HMGP & PA 406) is that PA 406 mitigation funds may only be applied to the element of a facility or system that received damage during the event, while HMGP funds may be applied State wide. For FEMA 1391-DR, HMGP funding would be targeted towards projects that directly benefit the five boroughs of New York City. HMGP becomes available as a result of a Presidential declared disaster event and the total available funding to the state may equal up to 15 percent of the total Federal grant assistance provided during the disaster. In the DR-1391 disaster declaration, President Bush capped the funds available for HMGP at 5 percent of the total Federal grant assistance provided during the disaster, minus the administrative costs.

The first step in applying for HMGP funds, is to develop and submit a Letter of Intent (LOI) to the New York State Emergency Management Office (SEMO) (Attn: Mr. Radworth Anderson) by potential applicants before February 19, 2002. New York City agencies must first submit their LOIs through the Office of Management and Budget (OMB) Task Force and/or the NYC Office of Emergency Management (OEM) by January 15, 2002 prior to the LOIs being forwarded on to SEMO. FEMA and the State would review all LOIs for eligibility consideration.

This section describes potential hazard mitigation projects that could receive funding under the HMGP or PA mitigation funding, or a combination of both. Other projects not associated with PA are also eligible for HMGP funding. They include: Continuity of Government and Business Operations; Awareness Initiatives; High-rise Building Safety; and Protection of Public Landmarks.

2.4.1 Infrastructure and Critical Property Protection

The protection of public infrastructure and utilities includes the following systems:

- Transportation systems—roads, mass transit (rail and bus), bridges, tunnels, and marine systems
- Water Supply Systems
- Wastewater Systems
- Electricity Transmission and Supply
- Gas Transmission and Supply
- Steam Transmission and Supply

Critical key governmental and healthcare facilities considered include the following:

- City Hall
- Borough President's Offices
- Police and Fire Department Buildings
- Healthcare Facilities, including Hospitals

These key governmental and healthcare facilities would also require protection of information systems and planning to develop loss prevention strategies.

No Action Alternative

FEMA funds would not be used to fund infrastructure, property protection, or continuity of government or business operations improvements. If local governments were unable to implement the proposed measures without Federal assistance, fire and explosion hazards would remain.

Proposed Action Alternative

Proposed projects included in the Infrastructure and Critical Property Protection category are structural and non-structural actions intended to mitigate future fire and explosion hazards. These projects consist of critical facilities and lifeline utilities protection, water supply, and residential, commercial, and industrial property protection.

Critical Facility and Utility Protection - Protection of critical facilities, such as hospitals and healthcare facilities is crucial for providing care and shelter should another disaster occur. Actions to protect these facilities could include retrofitting existing structures to consist of fire-retardant materials. Hardening or relocation of existing lifeline utility systems in high-risk areas for future fires or explosion impacts could be identified and implemented.

Water Supply Protection - Protection of drinking water and water supply for fighting fires is an integral part of disaster response resulting from acts against homeland security. A water supply project may relocate and retrofit water lines to provide water capacity for fire-fighting capabilities.

Construct New or Improve Existing Healthcare Facilities - It is likely that new healthcare facilities or improvement of existing healthcare facilities would occur under the HMGP or PA Mitigation Program. New structures would be built using fire and explosion-retardant materials and potentially located in an area with adequate firebreak protection. Existing structures may be retrofitted to include fire and explosion-safe materials. The development of additional or revised building codes, including seismic safety based on FEMA 368, may be created protect new structures from future damage related to fires and explosions and other natural disasters.

2.4.2 Awareness Initiatives and Strategies to Protect the Public***No Action Alternative***

FEMA funds would not be used to fund the development of systems or measures to reduce the threat of actions against homeland security through awareness initiatives and implementation of protection strategies against terrorism, technological hazards, severe weather and other natural hazards, fires and explosions. Initiatives would also be developed to protect or manage ingress or egress in high-rise buildings. The funding responsibility for these programs and strategy development initiatives would fall on the City and State governments and would not be implemented.

Proposed Action Alternative

Under the Proposed Action Alternative, federal funds would be used to support the development of awareness initiatives and strategies to protect the public, government agencies, and businesses against terrorism, technological hazards, severe weather and other natural hazards, fires and explosions.

- Physical measures such as barriers to limit vehicular access or redesigned pedestrian access to areas. Development of safeguards pertaining to open space protection, such as bridges and tunnels.
- Development of Homeland Security Plans based on security questionnaires to identify the risk and develop operational systems to reduce the threat of actions against homeland security.
- Initiatives developed to protect or manage ingress or egress in high-rise buildings.
- Protection of designated landmarks and listed historic and archeological resources.

This category is expected to cover a broad range of public education and outreach activities, as well as plan development for managing terrorism or other acts taken against homeland security.

Hazard Identification and Mapping – This alternative would create fire and explosion hazard maps used to identify areas where high risks or vulnerability exist (measured by such factors as high visibility due to use or occupancy, high volume public traffic, ease of accessibility, landmark preservation status, etc.). These maps would assist officials in identifying areas in need of mitigation measures to reduce the risk of future disasters.

Awareness and Outreach Programs – This alternative would allow for programs to educate the community on hazard reduction and prevention. Emphasis would be placed on terrorism, technological hazards, severe weather and other natural hazards, fires and explosions.

Emergency Services – This alternative would improve emergency warning and communication systems within the region and would establish alternative emergency evacuation routes.

High Rise Building Safety – This alternative would develop initiatives to improve emergency egress in high-rise buildings and also improve building resistance to severe weather such as hurricanes, northeasterly snow and rainstorms.

Landmark and Historic Resource Protection – This alternative would provide measures to protect and maintain designated landmarks and buildings listed on the State and National Register of Historic Places.

2.4.3 Floodplain Management/Flood Hazard Reduction

The World Trade Center site was a complex of seven buildings on approximately 16 acres of property. Groundbreaking for construction of the WTC North and South Towers began in 1966 and both buildings were completed by 1973, although tenants leased the lower floors beginning in 1970. In 1972, the City of New York joined the National Flood Insurance Program (NFIP). The effective Flood Insurance Rate Map (FIRM) for the WTC area is Community Panel Number 360497 0054B (54 of 131) dated November 16, 1983. According to the FIRM, a portion of the WTC site is situated in a special flood hazard area, Zone A5, having a base flood elevation of 10 feet. The WTC North and South Towers are considered pre-FIRM structures since construction was completed prior to the City's participation in the NFIP and therefore fully compliant structures within the NFIP. Future development and construction within the delineated flood hazard area would require compliance with Federal, state, and local floodplain management regulations and requirements. HMGP funding may be used to reduce hazards related to flood reduction projects, as prioritized by the State of New York.

No Action Alternative

Under the No Action Alternative, no federal funds would be made available to undertake flood reduction activities. Those areas located in the floodplain would continue to remain at risk from flood disasters.

Proposed Action Alternative

The proposed Stormwater Management actions could include measures that would reduce the potential for flood damage from future flood events. Proposed projects would be implemented to mitigate the potential for flooding by removing critical infrastructure from flood prone areas, decreasing the quantity of runoff and controlling stormflows, and managing erosion of area soils and the associated sedimentation into area waterways.

Stormwater System Resizing/Replacement/and Maintenance – Stormwater drainage systems may be re-sized, replaced, or maintained to increase or maintain the effectiveness of stormwater distribution. Re-sizing storm drainage to a larger diameter would increase the peak flow of stormwater and more effectively and quickly move stormwater downstream. However, downstream stormwater management would need to be considered.

Floodwall Construction – There is an existing floodwall constructed around the perimeter of the WTC complex. This floodwall may need to be repaired, restored, replaced or new floodwalls may need to be constructed of impervious material. New floodwalls of varying heights (depending on the base flood elevations) may be needed to protect an area from flooding during times of increased flows. Floodwalls typically parallel rivers, but can be constructed around the structures they are to protect, including around entrances to subways and tunnels (including the PATH train tunnel).