DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

15 May 09

Planning, Programs, and
Project Management Division
Environmental Planning
and Compliance Branch

DRAFT FINDING OF NO SIGNIFICANT IMPACT (DFONSI)

Orleans Parish Pump Station Stormproofing Activities

EA #474

Description of Proposed Action. The U.S. Army Corps of Engineers, New Orleans District, proposes stormproofing activities for 22 Orleans Parish pump stations, the Carrollton Frequency Changer Building, the Old River Intake Station, the New River Intake Station, and the Carrollton Water Plant and Power Complex. The purpose of the proposed project is to provide flood, hurricane, and storm damage risk reduction by helping to ensure pump station operation for the east and west banks of urbanized areas of Orleans Parish during, and immediately following large tropical storm events, and to provide safe refuge for Orleans Parish employees responsible for the operation and maintenance of the forced drainage system (i.e., pump operators).

The stormproofing activities of the proposed action vary for each facility but include: building hardening, elevated control rooms, modified roof structures, enhanced water intrusion and protection, protecting and enhancing electrical power production equipment, backup generators, underground ductbank for electrical lines, perimeter wall barriers, elevated generator buildings, pump replacement, installation of water wells to supply backup water for equipment cooling and lubrication, and other mechanical, electrical, and miscellaneous protection features (all as fully described in the EA).

This amended EA includes additional information and analysis of the construction sequencing plan not included in the EA originally released on April 17, 2009. The amended portions are highlighted in yellow.

Factors Considered in Determination. This office has assessed the impacts of the proposed action on significant resources, including non-wetland/upland resources, wildlife, endangered or threatened species, cultural resources, recreational resources, aesthetics, noise, air quality, social and economic resources and transportation. No significant adverse impacts were identified for any of the significant resources. The risk of encountering HTRW is low. No impacts were

identified that would require compensatory mitigation. By a faxsimile dated July 24, 2008, the U.S. Fish and Wildlife Service confirmed that the proposed action is not likely to adversely affect any endangered or threatened species. In a letter dated January 5, 2009 the Louisiana Department of Natural Resources concurred with the determination that the proposed action is consistent, to the maximum extent practicable, with the Louisiana Coastal Resources Program. A Water Quality Certificate was not required. A Section 404(b)(1) Public Notice and a Section 404(b)(1) Evaluation were not required because no work would impact wetlands or waters of the United States. In a letter dated January 5, 2009 the Louisiana State Historic Preservation Officer concurred with a recommendation of no effect on historic properties. This office has concurred with, or resolved, all Fish and Wildlife Coordination Act recommendations contained in a Coordination Act Report from the U.S. Fish and Wildlife Service, dated December 8, 2008.

Environmental Design Commitments. The following commitments are an integral part of the proposed action:

1) By a fax letter dated December 8, 2008, the U.S. Fish and Wildlife Service confirmed that the proposed action is not likely to adversely affect any endangered or threatened species. The Corps and its contractors shall instruct all personnel associated with the project of the potential presence of manatees in the area, and the need to avoid collision with these animals. All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. The Contractors shall be held responsible for any manatee harmed, harassed, or killed as a result of construction activities not conducted in accordance with these specifications.

2) The USFWS Coordination Act Report dated December 08, 2008 recommends that any proposed change in the proposed project features, locations or plans that would impact fish and wildlife habitat and/or wetlands shall be coordinated in advance with U.S. Fish and Wildlife Service, National Marine Fisheries Service and the Louisiana Department of Wildlife and Fisheries.

3) The USFWS Coordinated Act Report dated December 8, 2008 also recommends that if the proposed project has not been constructed within 1 year or if changes are made to the proposed project, the Corps should reinitiate Endangered Species Act consultation with the Service to ensure that the proposed project would not adversely affect any federally threatened or endangered species or their habitat.

4) If any unrecorded cultural resources are determined to exist within the proposed project boundaries, then no work will proceed in the area containing these cultural resources until a CEMVN-PM-RN archeologist has been notified and final coordination with the SHPO and THPO has been completed.

5) To minimize potential impacts to air quality, contractors would be instructed to conduct proper and routine maintenance of all vehicles and other equipment. These actions ensure that emissions would be within the design standards of all construction equipment. Contractors would be instructed to conduct proper and routine maintenance of all vehicles and other equipment.

These actions ensure that emissions would be within the design standards of all construction equipment. Dust suppression methods would be implemented to minimize fugitive dust emissions. Additionally, all construction equipment and vehicles would be required to be kept in good operating condition to minimize exhaust emissions.

Public Involvement. The proposed action has been coordinated with appropriate Federal, state, and local agencies and businesses, organizations, and individuals through distribution of Environmental Assessment #474 (EA #474) for their review and comment. EA #474 is attached hereto and made a part of this FONSI.

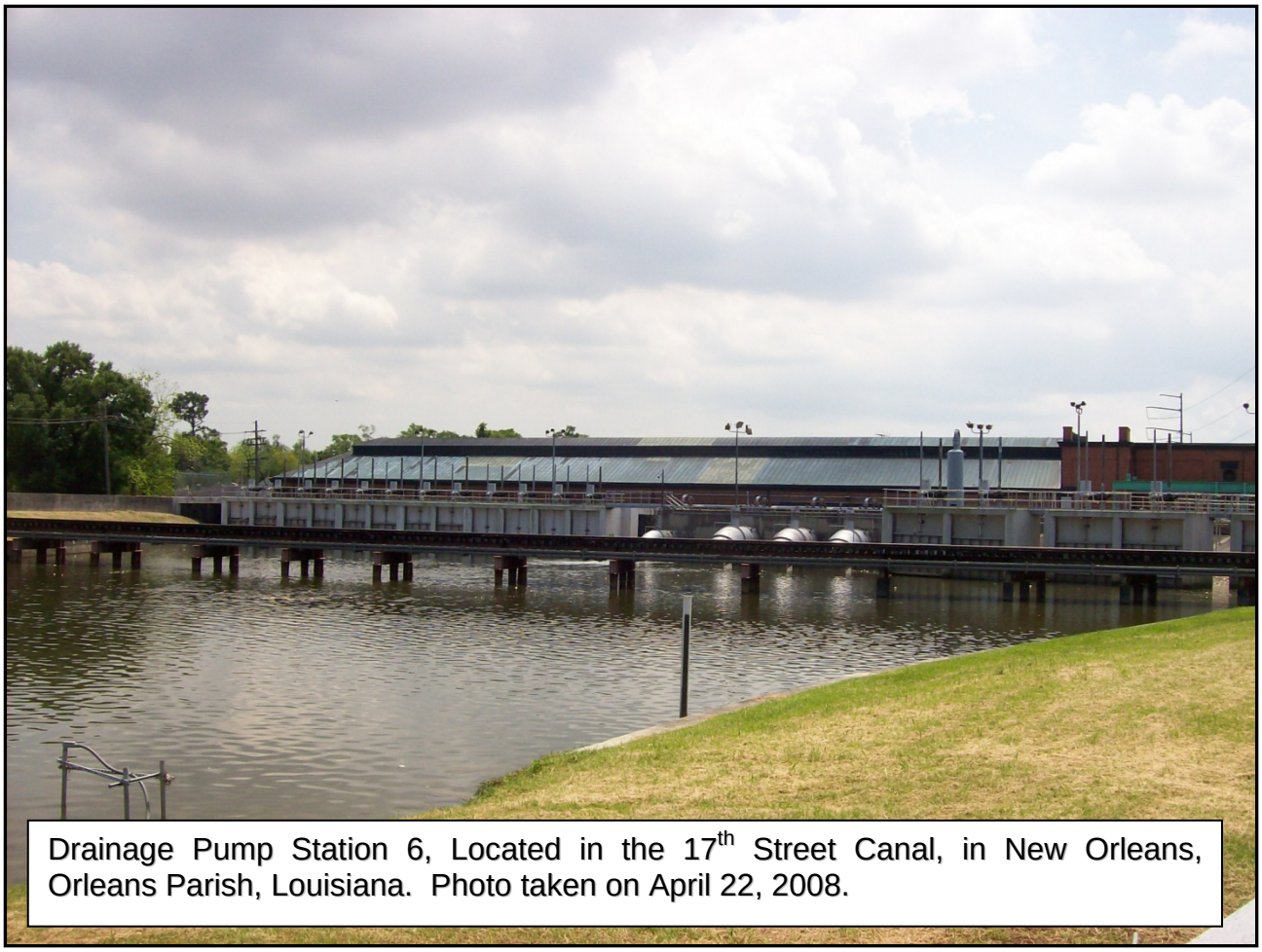
Conclusion. This office has assessed the potential environmental impacts of the proposed action. Based on this assessment, a review of the comments made on EA #474, and the implementation of the environmental design commitments listed above, a determination has been made that the proposed action would have no significant impact on the human environment. Therefore, an Environmental Impact Statement will not be prepared.

_____ **Draft** _____

Date

Alvin B. Lee
Colonel, U.S. Army
District Commander

U.S. ARMY CORPS OF ENGINEERS
ORLEANS PARISH PUMP STATION
STORMPROOFING ACTIVITIES
ENVIRONMENTAL ASSESSMENT
EA# 474
(Amended May 15, 2009)



Drainage Pump Station 6, Located in the 17th Street Canal, in New Orleans, Orleans Parish, Louisiana. Photo taken on April 22, 2008.

Prepared by:
U.S. Army Corps of Engineers
New Orleans District
Hurricane Protection Office

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LIST OF ACRONYMS AND ABBREVIATIONS

BMPs	Best Management Practices
CAA	Clean Air Act
CEMVN	New Orleans District
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	carbon monoxide
dB	decibels
dBA	a-weighted decibel
DFL	Design Flood Level
DNL	Day-night Sound Level
DPS	Drainage Pump Station
EA	Environmental Assessment
ER	Engineering Regulation
ESA	Environmental Site Assessment
FONSI	Finding of No Significant Impact
HTRW	Hazardous, Toxic, and Radioactive Waste
HZ	hertz
IHNC	Inner Harbor Navigation Canal
kW	kilowatt

Leq	Equivalent Sound Level
mph	miles per hour
MVN	New Orleans District
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	Noise Sensitive Areas
O_3	ozone
Pb	lead
PCAs	Project Cooperation Agreements
PL	Public Law
PM	particulate matter
REC	recognized environmental condition
S&WB	Sewerage and Water Board
SELA	Southeast Urban Flood Control
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOCs	volatile organic compounds
WRDA	Water Resources Development Act

INTRODUCTION

The U.S. Army Corps of Engineers (USACE), New Orleans District (CEMVN) has prepared this Environmental Assessment (EA #474) to evaluate the potential impacts associated with the proposed stormproofing modifications at 26 facilities currently lacking adequate stormproofing measures to ensure their operability during hurricanes, storms, and high water events. The Proposed Action is located throughout the City of New Orleans and Orleans Parish. EA #474 has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's Regulations (40 Code of Federal Regulations [CFR] 1500-1508), as reflected in the USACE Engineering Regulation (ER) 200-2-2.

Key issues to be analyzed in this EA are the potential impacts that operator room improvements, structural improvements, leakage removal, wind proofing, electrical improvements, mechanical improvements, and utility improvements would have on both the natural and human environments. This EA will assist the USACE and Sewerage and Water Board of New Orleans (S&WB) in deciding among alternatives, how best to implement the preferred alternative, and determining the potential need for any appropriate mitigation measures.

Orleans Parish is located in southeast Louisiana in the metropolitan New Orleans area. It is bounded by the parishes of St. Tammany (north), St. Bernard (east), Plaquemines (south), and Jefferson (south and west). Lake Pontchartrain, part of which is included in the Parish limits, lies to the north, and Lake Borgne lies to the east. Since 1851, 51 hurricanes have made landfall on the Louisiana coast, 20 of which were considered major storms (Category 3 or greater). Of the 51, eleven have made landfall in Orleans Parish (National Hurricane Center 2008). Even relatively small tropical storm events typically include large amounts of rainfall accompanying the high winds and potential storm surge. For example, Tropical Storm Frances deposited up to 21 inches of rainfall during a 3-day period in Orleans Parish and in much of south Louisiana in September 1998, causing extensive flooding (National Hurricane Center 2006). High rainfall amounts during short periods of time are typical of tropical storms, and have the potential to flood much of the low-lying areas of Orleans Parish (with an average elevation of approximately 5 feet below sea level, and ranging from as high as +12 feet near the Mississippi River to -9 feet) in the absence of the full operation of the forced drainage system.

Because much of Orleans Parish is below sea level it relies upon forced drainage (a total of 22 pump stations) to remove excess water during storm events. The system's pumping capacity is over 29 billion gallons a day. The flow rate is over 45,000 cubic feet per second. The drainage network includes approximately 90 miles of open canals and 90 miles of subsurface canals.

A series of Drainage Pump Station (DPS), the Carrollton Frequency Changer Building, the Old River Intake Pump Station, the New River Intake Pump Station, and the Carrollton Water Plant and Power Complex (26 locations in total) are located throughout the Greater New Orleans Area, New Orleans East, and portions of Algiers and Belle Chase communities (see Figure 2). The DPS collect storm water runoff that gathers in the drainage canal network and discharges the storm water into adjacent waterbodies including Lake Pontchartrain, the Mississippi River, the Intracoastal Waterway, and the Mississippi River Gulf Outlet (see Figure 1). Diesel-powered and electric-powered pumps move storm water at each pump station. In order to operate the pumps during storm events, personnel are needed to remove trash and debris that can clog pump intakes, monitor the operating pumps, and engage or disengage pumps depending on the amount of rainfall to remove storm water efficiently.

PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to provide flood, hurricane, and storm damage reduction by helping to ensure operation of the 22 Drainage Pump Stations (DPS), the Carrollton Frequency Changer Building, the Old River Intake Station, the New River Intake Station, and the Carrollton Water Plant and Power Complex for the City of New Orleans (Figures 1 and 2) during, and immediately following tropical storm events, and to provide safe refuge for S&WB employees that are responsible for the operation and maintenance of the forced drainage system. Forced drainage is necessary in the City of New Orleans because the majority of the City is below sea level and therefore dependent on pumping stations for the evacuation of water. The overall need of the project is to provide a comprehensive, integrated storm water drainage system that would provide for production of power and the pumping capacity to discharge storm water into adjacent water bodies and to reduce the imminent and continuing threat to life, health, and property posed by flooding from hurricanes and other tropical storm events. The proposed action includes features that would significantly increase the ability of each DPS to maintain operator presence during and after storm events, resist storm winds, resist wind driven water intrusion into the DPS, and maintain pumping capability after storms.

The proposed action results from the need to protect residences and businesses in Orleans Parish from flood waters caused by high rainfall during tropical storms, to protect infrastructure from flooding as a result of tropical storms, and to retain the ability to utilize transportation routes located in the floodplain for evacuation and protection of residents during and immediately following future tropical storms.

AUTHORITY FOR THE PROPOSED ACTION

The Proposed Action was authorized by the Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Public Law [PL] 109-234; 4th Supplemental) Additional funding was provided in the Fiscal Year 2008 Emergency Supplemental Funding, P.L. 110-252 (6th Supplemental).

PRIOR REPORTS

Information on pump stations and pump station repairs completed immediately following Hurricane Katrina come from the “Project Information Report for Rehabilitation of Damaged Flood Control Works, Federal and Non-federal Pump Stations, Flood Control, Orleans Parish, Louisiana” (2006). The following reports are associated with the Proposed Action and are incorporated herein by reference.

West Bank of the Mississippi River in the Vicinity of New Orleans Project Feasibility Report (1986).

Jefferson and Orleans Parishes, Louisiana Urban Flood Control and Water Quality Management Reconnaissance Study. (1992).

West Bank of the Mississippi River in the Vicinity of New Orleans, Louisiana (East of Harvey Canal) Feasibility Report (1994).

EA #165 – Westwego to Harvey Canal Disposal Site (1992).

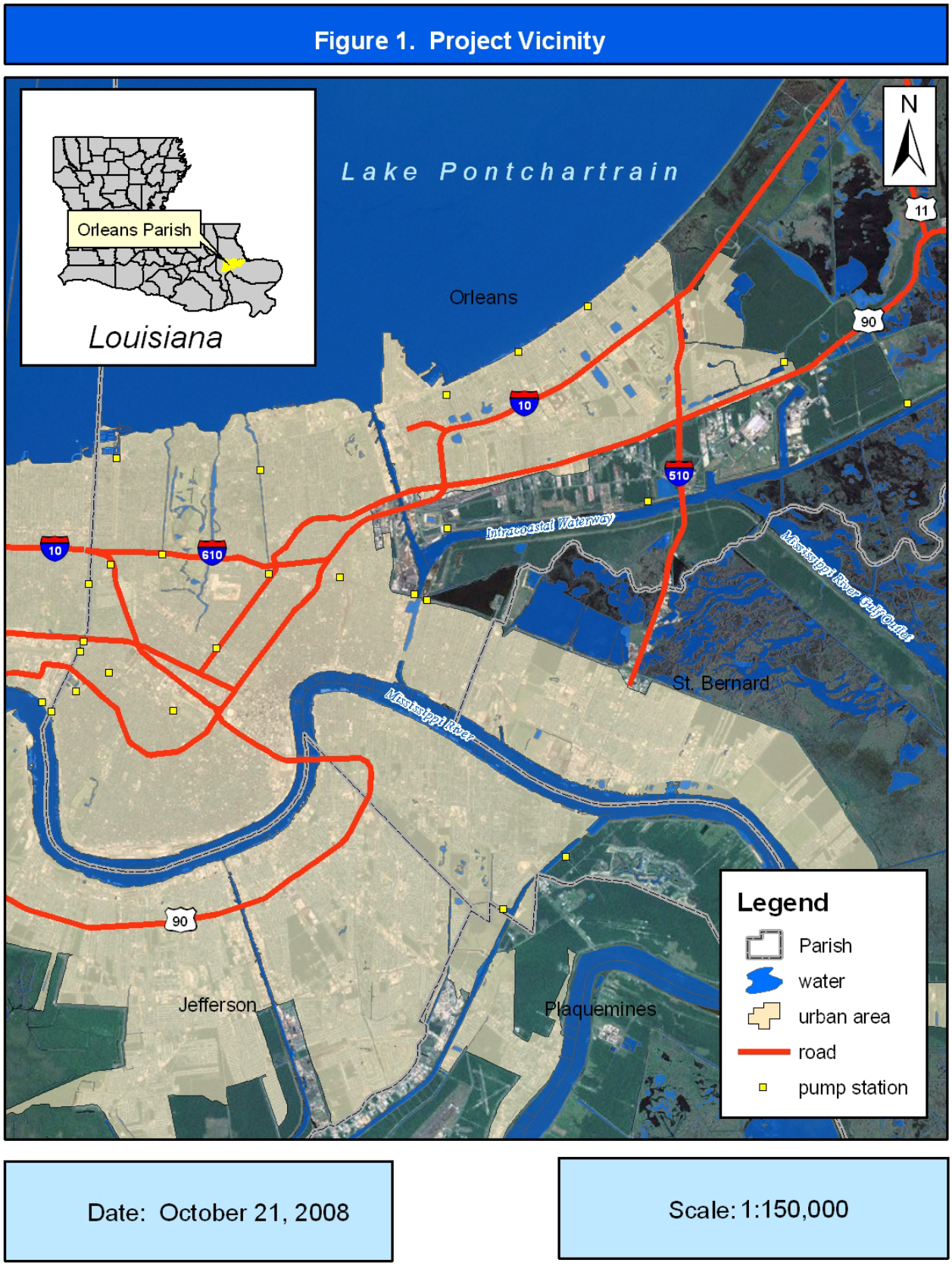


Figure 1. Vicinity Map

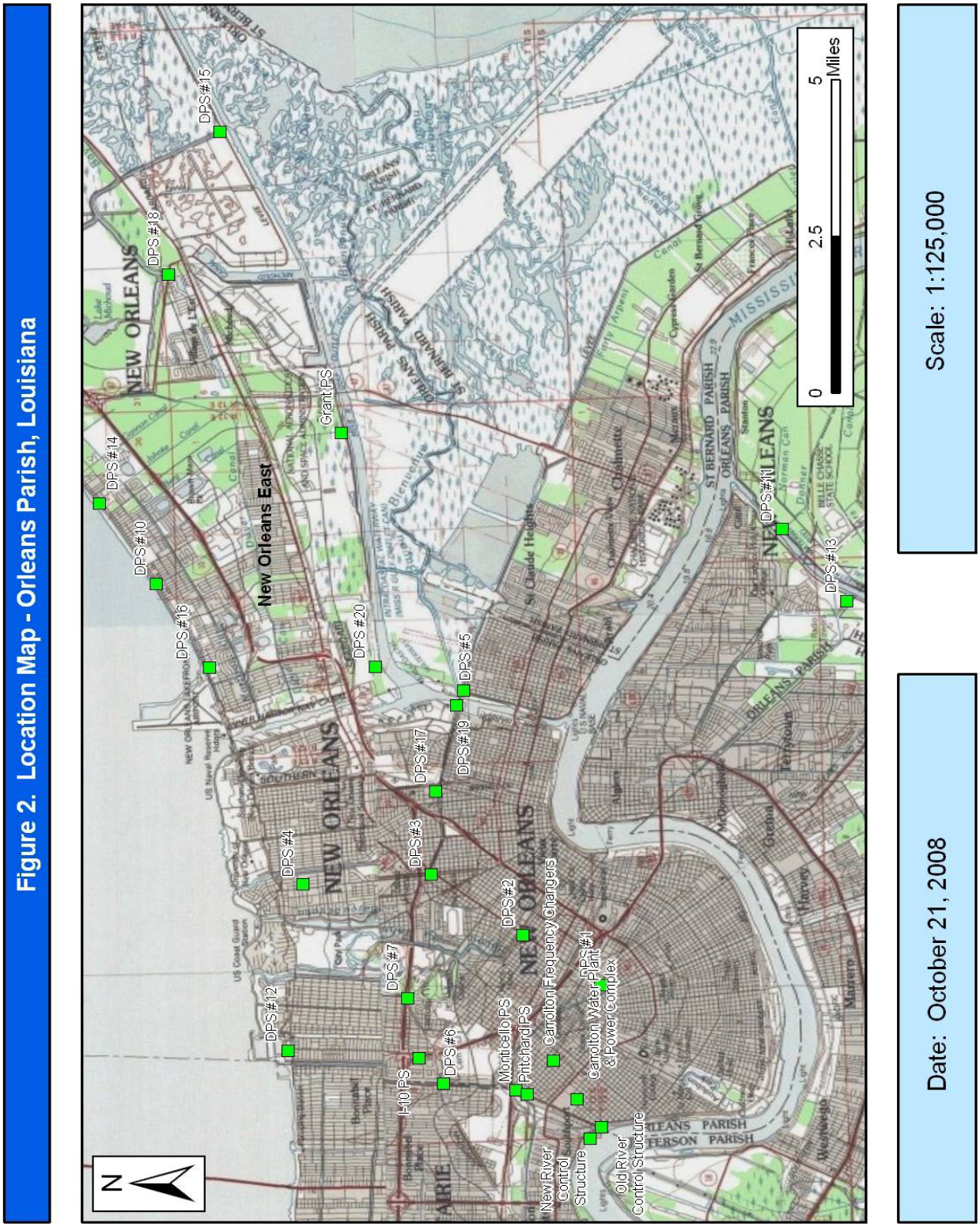


Figure 2. Location Map.

EA #208 – Lake Pontchartrain Stormwater Discharge, Louisiana, Orleans Parish Demonstration Project (1995).

Supplemental EA #208A – Lake Pontchartrain Stormwater Damage Discharge, Orleans Parish, Louisiana Demonstration Project (1996).

EA #236 – Southeast Louisiana Urban Flood Control Orleans Parish Technical Report (1996).

EA #238 – Southeast Louisiana Urban Flood Control Orleans Parish Technical Report #2 (1996).

Westwego to Harvey Canal, Louisiana Hurricane Protection Project Lake Cataouatche Area, Environmental Impact Statement (1996).

EA #306 - West Bank and Vicinity, New Orleans, Louisiana, Hurricane Protection Project, Harvey Canal Sector Gate Site Relocation and Construction Method Change (2002).

Supplemental EA #306A – West Bank of the Mississippi River in the Vicinity of New Orleans, East of the Harvey Canal, Floodwall Realignment and Change in Method of Sector Gate (2005).

EA #315 – Southeast Louisiana Urban Flood Control Project East of Harvey Canal, 533(d) Report, West Bank Basin Canal and Pumping Station Modifications, Orleans Parish, Louisiana (2001).

EA #320 – Harvey Canal Hurricane Protection Features Orleans Parish Louisiana (2000).

EA #337 – West Bank and Vicinity New Orleans Louisiana Hurricane Protection Project Algiers Canal Levee Alternate Borrow Site (2003).

EA #433 - U.S. Army Corps of Engineers Response to Hurricanes Katrina and Rita in Louisiana (2006).

EA #454 – U.S. Army Corps of Engineers Jefferson Parish Pump Station Stormproofing Activities (2007).

PUBLIC CONCERNS

The greatest area of public concern is related to the importance of providing hurricane, storm, and flood damage reduction for businesses, residences, and infrastructure providing for public safety during major storm events. In August 2005, Hurricane Katrina forced a majority of parish residents from their homes, and, due to extensive flooding, made returning in a timely manner unsafe. Additionally, S&WB is responsible for the safety of pump operators during major tropical storm events. Without the appropriate stormproofing measures at manned pump stations, pump station operators must be evacuated to a location that would help ensure their safety during and immediately following the storm event.

DESCRIPTION OF PROPOSED ACTION

The proposed action consists of stormproofing up to 22 DPS, the Carrollton Frequency Changer Building, the Old River Intake Station, the New River Intake Station, and the Carrollton Water Plant and Power Complex. These facilities are depicted on maps included in Appendix A. The Sewerage and Water Board of New Orleans (S&WB) is responsible for the water and drainage systems in Orleans Parish. The Orleans Parish Stormproofing Description of Work Elements Document assessed each DPS, including operator room improvements, structural improvements, leakage removal, wind proofing, electrical improvements, mechanical improvements, and utility improvements. The document identified numerous stormproofing measures, which include, but are not limited to, building hardening, elevated control rooms, modified roof structures, enhanced water intrusion and protection, protecting and enhancing electrical power production equipment, backup generators, underground ductbank for electrical lines, perimeter wall barriers, elevated generator buildings, pump replacement, installation of water wells to supply backup water for equipment cooling and lubrication, and other mechanical, electrical, and miscellaneous protection features. Unless specifically noted, the proposed water wells would be constructed within existing pump station property and the exact locations would be determined during the design phases of the project. It is anticipated that during the design stage other miscellaneous electrical and mechanical improvements may be required.

Stormproofing design criteria were based on the threshold wind speed from that required by the International Building Code up to the wind speed for an upper Category 3 hurricane on the Safir-Simpson scale. The design flood level (DFL) was chosen based as the static flood level experienced at each pump station during Hurricane Katrina plus 2 feet of freeboard.

DPS 1, 2, 3, 5, 6, 7, and 17 are listed as historically significant and are eligible for nomination to the National Register of Historic Places (NRHP). Special methods and materials that are sensitive to the historical nature and materials of these pump stations are discussed. The remaining facilities (DPS 4, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, I-10, Pritchard, Monticello, Grant, Carrollton Frequency Changer building, Old River Intake Pump Station, New River Intake Pump Station, and Carrollton Water Plant and Power Complex) are not listed or eligible as historically significant.

For all pump stations including the historical pump stations, roof systems may need to be replaced depending on the final results of a detailed design analysis. In addition trusses within the historical pump stations may need to be structurally enhanced or new trusses placed between the existing trusses in order to withstand the design load conditions.

Maps of each DPS are provided in Appendix A and detailed descriptions of the actions proposed at each DPS are summarized in Table 1 and described on the following pages.

Table 1: Summary of Proposed Actions at 22 Drainage Pump Stations in Orleans Parish

Orleans Parish Pump Stations	Pump Station	NRHP	Water Intrusion Protection	Roof	Wall Reinforcement	Louvers, Doors	Hurricane Shutters	Ventilation	Pump Generator	Pump House Generators	Water Well	Fuel Tanks/ Containment	Pumps	Electrical/ Mechanical Equipment	HTRW	Ductbank	Control Room	Station Designed for Auto Control
	DPS #1[1]	X	X	X	X	X	X	X		X	X	X	X	X		X		
	DPS #2[1]	X	X	X	X	X	X	X		X	X	X	X	X				
	DPS #3[1]	X	X	X	X	X	X	X		X	X	X	X	X				
	DPS #4		X	X	X	X	X	X		X	X	X	X	X				
	DPS #5[1]	X	X	X	X	X	X	X	X	X	X	X	X	X			X	
	DPS #6[1]	X	X	X	X	X	X	X	X	X	X	X	X	X				
	DPS #7[1]	X	X	X	X	X	X	X	X	X	X	X	X	X				
	DPS #10			X	X	X	X	X	X	X	X	X		X				X
	DPS #11		X	X	X	X	X	X		X	X	X	X	X				
	DPS #12		X	X	X	X	X	X		X	X	X	X	X		X		
	DPS #13		X	X	X	X	X	X	X	X	X	X	X	X				
	DPS #14[3]			X	X	X	X	X		X	X	X		X	X			X
	DPS #15		X	X	X	X	X	X			X	X	X	X				X
	DPS #16			X	X	X	X	X		X	X	X		X				X
	DPS #17[1]	X	X	X	X	X	X	X	X		X	X	X	X				
	DPS #18												X	X				X
	DPS #19		X	X	X	X	X	X		X	X	X	X	X				
	DPS #20		X	X	X	X	X	X	X	X	X	X	X	X				X
	DPS #I-10		X	X	X	X	X	X		X	X	X		X				X
	DPS Pritchard[2]		X	X	X	X		X		X	X	X	X	X				X
	DPS Monticello[2]		X	X	X	X		X		X	X	X	X	X				X
	DPS Grant		X	X	X	X		X		X	X	X	X	X				X
	Carrollton Frequency Changer		X	X	X	X	X	X					X					
	Old River Intake		X	X	X	X	X	X		X		X	X	X				
	New River Intake		X	X	X	X	X	X		X		X		X				
	Carrollton Water Plant and Power Complex[3]		X	X	X	X	X	X	X			X	X		X	X		

[1]Those stations designated under NRHP will have special methods and material used in waterproofing of the building in order to maintain the historic look of the building. [2] Due to the close proximity of DPS Pritchard and DPS Monticello, the stations will share a water well. [3]HTRW issues consist of minor stains on concrete that might be due to transfer operations. These sections can be avoided and designated as No Work areas during construction

DPS #1

DPS 1 is located in the median of South Broad Avenue, at the terminus of Martin Luther King Jr. Boulevard (see page A-1). This station pumps water from the Melpomene and Broad Avenue Canals to the Metairie Relief and Palmetto Canals. DPS 1 is listed as historically significant and is eligible for nomination to the NRHP; therefore under the proposed action, special methods and materials that are sensitive to the historical nature and materials of this DPS would be utilized to enhance water protection of the entire perimeter of the exterior wall at least to the DFL on the exterior surface. This includes the use of waterproofing materials that will seal the brick and mortar (e.g., Sta-Dri and Siloxane PD) without discoloring the brick. These waterproofing materials would allow the brick to breathe which prevents moisture retention which could damage these materials. These special methods would help retard water intrusion into the DPS while maintaining the historical character of the building. Other materials or methods are likely to be discovered during the design phase of the project that could be successfully used on these historical structures without impacting their integrity or appearance.

The wooden doors of the facility would be replaced with storm doors that are rated for high wind events and which would be anchored to the masonry. The doorways would be modified to accept an approved flood barrier system. The rollup doors would be replaced with hurricane rated units, and the rollup doorways could be modified to accept a minimal leakage bolt-in-place stop log system. The entire roof system would be replaced with a roofing system designed for the USACE'S required wind loading conditions. While the existing roof trusses are sufficient, they would be secured to the foundation by a tethering system. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters.

As the initial wind analysis showed the occurrence of wall failures at DPS 1, would require buttresses that would be constructed at the pilasters and other wall sections to ensure the walls withstand the wind loading scenario. For cost estimation purposes, the buttresses were assumed to have a footprint of 18 inches (") by 24" by the height of the roof truss. These buttresses or columns could be constructed on either side of the wall, but ideally would be installed on the interior of the building of the historic structures such as DPS 1.

Due to foreseen and unforeseen leakage that could occur, sump pumps would be installed at various critical and non critical pits in the station which are below the DFL. For many of the older stations such as DPS 1, critical low points include pits which partially house synchronous motors. Permanent curbs or aluminum plate barriers would be installed around the perimeter of the motor pits for Pumps C, D, and E to further prevent intrusion of any flood waters which have found their way onto the operating floor. Small sump pumps would be installed in Pumps C, D, and E pits to remove any leakage through the barrier. A larger sump pump would be placed in the rheostat pit which would be used to collect and remove leakage from the Pump F and G portion of the station.

Various other low points, such as vertical pump/constant duty pits and reactor or rheostat pits would intentionally be allowed to collect operating floor leakage. At DPS 1, the Constant Duty #2 pit, the Pump E reactor pit, and the Pump G gear pit would be utilized as leakage collection sumps and would house larger submersible leakage removal pumps. A sump pump would also be installed in the Constant Duty #2 pit. If superstructure perimeter leakage is significantly less than the design amount, this pump would be capable of removing minimum leakage from the pit, thereby protecting Constant Duty Pump #2 from damage.

For pumps F and G, the gearbox output shaft oil seals would be replaced with more watertight units. The vacuum pump unit for Pump 5 would be elevated on a concrete foundation above the DFL. The water booster pumps and canal gate controls would be raised above the DFL.

All conduits which may potentially be exposed to flood water pressures equivalent to the DFL would be sealed with conduit sealing bushings to prevent the intrusion of water into the cabinets and the station.

The proposed action calls for the completion of the 60 hertz (HZ) underground ductbank along Earhart Boulevard between Eagle Street and Pine Street (see page A-2). This would complete the connection between the Carrollton Power Plant and DPS 1 and would allow 60 HZ power to be directly connected from the new 60 HZ 15 megawatt (MW) generator proposed at the Carrollton Power Plant to the existing Pumps F and G at DPS 1. The ductbank would be installed during the Earhart Boulevard road reconstruction project which is scheduled to start in 2009 and take approximately 18 months to complete.

A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, and to power the proposed station leakage removal pumps. This generator would be located inside the existing facility in close proximity to the control room and mounted to avoid flooded conditions.

A water well (approximately 200 – 700 foot deep) would be drilled on the northeast portion of the station to supply backup water for equipment cooling and lubrication.

DPS #2

DPS 2 is located in the median of North Broad Avenue, between Conti Street and St. Louis Street (see page A-3 and Photograph 1). This station pumps water from the St. Louis Street Canal to the Kenilworth Canal or down Broad Avenue to station DPS 3. DPS 2 is listed as historically significant and is eligible for nomination to the NRHP; therefore, special methods and materials would be utilized to enhance water protection of the entire perimeter of the exterior wall at least to the DFL on the exterior surface.

Photograph 1. Example of Orleans Parish Drainage Pump Station (DPS 2). Photo taken on April 22, 2008.

The wooden doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The doorways would be modified to accept an approved flood barrier. The entire roof system would be replaced, and the roof trusses would be tied down to the foundation by a tethering system. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

Dry run sump pumps would be installed in the Pump A and B motor pits to remove any leakage. At DPS 2, the basement would be utilized as a leakage collection sump and would house a larger submersible leakage removal pump. As no other existing pits are available for sump usage, a fabricated steel sump pit would be constructed immediately southwest of the Constant

Duty pumps also housing a submersible pump. The water booster pump would be elevated above the DFL to allow for operating of the hydraulic suction basin bypass gate in the event of the loss of all pumping capacity.

All conduits that penetrate the building below the DFL would be sealed. A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, and to power the proposed station leakage removal pumps. This generator would be located inside the existing facility. An approximate 1,000 gallon fuel tank is proposed for the building generator. Earthen berms and/or fuel containment structures would be constructed in full compliance with applicable regulations to prevent fuel spills or leaks. The design details of the fuel containment structures would be determined during the design phase of the project.

A water well would be drilled within the existing pump station property to supply backup water for equipment cooling and lubrication. The location would be determined based on the location of existing equipment and utilities.

DPS #3

DPS 3 is located at the intersection of North Broad Avenue and Florida Avenue. This station pumps water from the Broad Avenue and Florida Avenue Canals to the London Avenue Canal (see page A-4). DPS 3 is listed as historically significant and is eligible for nomination to the NRHP; therefore, special methods and materials would be utilized to enhance water protection of the entire perimeter of the exterior wall at least to the DFL on the exterior surface.

The wooden doors would be replaced with storm doors, and the rollup doors would be replaced with hurricane rated units. The doorways and window openings would be modified to accept an approved flood barrier. The entire roof system would be replaced and the roof trusses would be secured to the foundation by a tethering system. All windows would have manually operated hurricane shutters installed and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

Dry run sump pumps would be installed in the Pump A and B pits to remove any leakage. The basement would be utilized as a leakage collection sump and would house a larger submersible leakage removal pump. As no other existing pits are available for sump usage, a fabricated steel sump pit would be constructed east of the Constant Duty pumps also housing a submersible pump. Permanent curbs or walls would be installed around the perimeter of the motor pits for Pumps C and D. A small sump pump would be installed in the curbed pit to remove any leakage.

All conduits that penetrate the building below the DFL would be sealed. Although pump station building generators exist, an approximate 50 kilowatt (kW) generator would be installed to provide power for the proposed station leakage removal pumps. This generator would be located inside the existing facility.

A water well (approximately 200 – 700 foot deep) would be drilled on the northwest portion of the station within the drainage easement to supply backup water for equipment cooling and lubrication.

DPS #4

DPS 4 is located on the east side of the London Avenue Canal, at the corner of Warrington Drive and Prentiss Avenue (see page A-5). This station pumps water from the St. Anthony

Avenue and Prentiss Avenue Canals to the London Avenue Canal. The entire perimeter of the exterior wall of the original pump station structure would be coated with an approved water proofing material at least to the DFL on the exterior surface.

The wooden doors would be replaced with storm doors, and the rollup doors would be replaced with hurricane rated units. The doorways would be modified to accept an approved flood barrier. The entire roof system would be replaced. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

The basement would be utilized as a leakage collection sump and would house a larger submersible leakage removal pump. A dike wall would be constructed around pumps C, D, E, and the Constant Duty pump, and dry run sump pumps would be placed within the proposed dike areas of the three horizontal pumps. The handrail around the Constant Duty pit would be replaced with a permanent masonry/steel plate wall. Access ways would be modified to accept inflatable seal barriers.

The 60 HZ and 25 HZ switchgear would either be water protected up to the DFL or be relocated on a new elevated platform. A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, and to power the proposed station leakage removal pumps. This generator would be located inside the existing facility. An approximate 1,000 gallon fuel tank is proposed for the building generator. Earthen berms and/or fuel containment structures would be constructed in full compliance with applicable regulations to prevent fuel spills or leaks. The design details of the fuel containment structures would be determined during the design phase of the project.

A water well (approximately 200 – 700 foot deep) would be drilled to the north of the station within existing pump station property to supply backup water for equipment cooling and lubrication.

DPS #5

DPS 5 is located on the east side of the Inner Harbor Navigation Canal (IHNC) along Florida Avenue (see page A-6). This station pumps water from the Florida Avenue and Jourdan Avenue Canals to Bayou Bienvenue. Since the DFL projects nine feet of water on the existing older station pump floor, it was not deemed safe or feasible to provide enhanced water protection for the station superstructure to the full extent of the DFL. It is possible to protect against lower levels of flooding, and that level would be determined during the detailed design phase. DPS 5 is listed as historically significant and is eligible for nomination to the NRHP; therefore, specialized design measures may be required by the State Historic Preservation Office.

The doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The entire roof system of the original station and expansion would be replaced, and the roof trusses would be secured to the foundation by a tethering system. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters.

DPS No. 5 is composed of two pumping configurations on this site. The first is the older station consisting of 1,260 cfs pumping capacity. The second is a single 1000 cfs horizontal pump. This second configuration was built later along with a siphon under the Inner Harbor

Navigational Canal (IHNC) to connect the west side of the IHNC to the intake basin of 1000 cfs DPS 5. This siphon allowed drainage water to be diverted to DPS 5 from the west side of the IHNC during heavy rain events. After DPS 19 was fully constructed the need to divert water was greatly diminished. Subsequently the Florida Avenue railroad bridge was reconstructed. During this reconstruction process it was necessary to drive the bridge footing foundations at locations that required the demolition of this siphon. Consequently the need for the 1000 cfs pump at DPS 5 was minimized. Although this 1000 cfs pump was connected to the suction basin of DPS 5, the ability to deliver full flow to this pump due to suction basin geometric/hydraulic configurations is limited. After the submergence of DPS 5 by storm water from Hurricane Katrina all the pumps at DPS 5 were damaged. The pump was not repaired after Hurricane Katrina because it was anticipated that it would be replaced during the stormproofing work with vertical pumps housed on an elevated structure. The proposed action provides for the replacement of the existing 25 HZ 1,000 cfs Pump D with two new 60 HZ 300 cfs each vertical pumps

A new elevated structure would be constructed and would house a new control room. During the design phase it would be determined if the existing slab and supporting pile structure can be reused or if a new slab and pile system would need to be constructed. If a new slab and pile system is required, it would be located within the existing pump station property and a portion of the existing slab would be demolished to accomplish the installation of the new slab and piles.

Sump pumps would be placed in the lower levels to remove water seepage, and the water booster pump would be replaced with a submersible unit. All conduits that penetrate the building below the DFL would by sealed.

A 60 HZ back-up generator would be installed to power the new pumps and house power for the pump station and sump pumps. The approximate size of the generator is 3 MW. Included with the generator is a proposed radiator and fuel tanks to be installed on the west side of the pump station property.

A water well (approximately 200 – 700 foot deep) would be drilled within the existing pump station property to supply backup water for equipment cooling and lubrication.

DPS #6

DPS 6 is located in the 17th Street Canal, south of I-10, where the railroad tracks cross the canal (see page A-7). This station pumps water from the Palmetto Canal to the 17th Street Canal. DPS 6 is listed as historically significant and is eligible for nomination to the NRHP; therefore, special methods and materials would be utilized to enhance water protection of the entire perimeter of the exterior wall at least to the DFL on the exterior surface.

The wooden doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The doorways and window openings would be modified to accept an approved flood barrier. The entire roof system from the 1980 expansion would be replaced, and the roof trusses would be secured to the foundation by a tethering system. The standing seam metal panels in the remaining portion of the station would be replaced with stronger corrugated panels or would be further secured with gasketed screws. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

Dry run sump pumps would be installed in the Pump A and B pits to remove any leakage. The various existing pits or low points would be utilized as leakage collection sumps. Constant Duty pits 1 and 2, the basement, the rheostat pit for Pump D, and a new sump in the area of Pump G would house larger submersible leakage removal pumps. In additional, run dry sump pumps would be placed in or adjacent to the six horizontal synchronous motor pits. Permanent curbs or walls would be installed around the perimeter of the motor pits for Pumps C, D, E, and F. A small sump pump would be installed in the reactor pit to remove any leakage.

Previous Task Force Guardian (TFG) work includes the installation of two 60 HZ back-up generators to power the pumps. The approximate size of generators is 3,750 kW. These generators are located within the 1980 expansion portion of the building. Included with the generators are a radiator and two approximate 30,000 gallon fuel tanks installed in the northwest corner of the pump station property. Earthen berms and/or fuel containment structures were constructed in full compliance with applicable regulations to prevent fuel spills or leaks.

A pump station building generator is proposed to supply 60 HZ power to the proposed station leakage removal pumps. This generator would be located inside the existing facility.

A water well (approximately 200 – 700 foot deep) would be drilled within the existing pump station property to supply backup water for equipment cooling and lubrication.

DPS #7

DPS 7 is located in the Orleans Avenue Canal, just south of I-610, between I-610 and the railroad tracks (see page A-8). This station pumps water from the Kenilworth Canal to the Orleans Avenue Canal. DPS 7 is listed as historically significant and is eligible for nomination to the NRHP; therefore, special methods and materials would be utilized to enhance water protection of the entire perimeter of the exterior wall at least to the DFL on the exterior surface. In addition, the north face of the building adjacent to the discharge canal, including the concrete catwalk, would be coated below the DFL to the discharge canal waterline. In the north wall, adjacent to the 'pancake pump' pits, an area of the existing brick mortar masonry that is exhibiting an active leak would require sealing of all cracks and voids by application of a suitable hydrophilic polyurethane or low-modulus epoxy material.

Additional application of water proofing in the interior of the station and sealing of cracks and voids would also be performed. Three pits would require sealing of cracks and voids in the brick mortar masonry by application of a suitable hydrophilic polyurethane or low-modulus epoxy material. After all such cracks and voids have been sealed, the surfaces of the pits would be waterproofed with a suitable water proofing material. The highest limit of waterproofing material would be the lowest extent of the existing glazed brick.

The wooden doors would be replaced with storm doors, and the rollup doors would be replaced with hurricane rated units. The doorways would be modified to accept an approved flood barrier. The standing seam metal panels would be replaced with stronger corrugated panels or would be further secured with gasketed screws. The roof trusses would be secured to the foundation by a tethering system. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

A dry run sump pump would be installed in the Pump A pit to remove any leakage. The basement, the Constant Duty pit, and the Pump 5 pit would be utilized to house submersible leakage removal pumps. In additional, run dry sump pumps would be placed in or adjacent to the two horizontal synchronous motor pits and conduits entering Pumps A and C motor pits would be sealed. A permanent curb or wall would be installed around the perimeter of the motor pits for Pump C and a small sump pump would be installed in the reactor pit to remove any leakage.

All conduits that penetrate the building below the DFL would by sealed. A 60 HZ back-up generator would be installed to power Pump D. The approximate size of the generator is 3 MW. An area exists west of the station for installation of the generator (see Photograph 2). Included with the proposed generator are an elevated generator building (approximately 35 feet by 45 feet), radiator, and the installation of an approximate 30,000 gallon tank. Earthen berms and/or fuel containment structures would be constructed in full compliance with applicable regulations to prevent fuel spills or leaks. The design details of the fuel containment structures would be determined during the design phase of the project.

Photograph 2. Proposed location of back-up generator at DPS 7. Photo taken on April 23, 2008.

A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, and to power the proposed station leakage removal pumps. This generator would be located inside the existing facility.

A water well (approximately 200 – 700 foot deep) would be drilled to the west or south of the pump station within existing pump station property to supply backup water for equipment cooling and lubrication. Excavated materials would be spread around the site if deemed suitable for disposal.

DPS #8 and #9

These DPS no longer exist. They have been previously phased out of the system, so no improvements or alternatives are proposed.

DPS #10

DPS 10 is located east of Lakefront Airport along Hayne Boulevard (see page A-9). This station pumps water from the Citrus Canal into Lake Pontchartrain. This pump station is designed to be placed on automatic control without operator presence.

The doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The entire roof system would be replaced, and the roof trusses would be tied down to the foundation by a tethering system. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. The existing masonry operator room would have all windows replaced with impact resistant units. The existing concrete roof on the operator room would be thickened with the addition of concrete panels up to a maximum of 15” thick. The local controls for the screen cleaners would be raised above the DFL.

A 60 HZ back-up generator would be installed to power Pumps 1 through 4. The approximate size of the generator is 3 MW. Included with the proposed generator are an elevated generator building, radiator, and an approximate 30,000 gallon fuel tank. Earthen berms and/or fuel containment structures would be constructed in full compliance with applicable regulations to prevent fuel spills or leaks. The design details of the fuel containment structures would be determined during the design phase of the project. The generator and accessories are proposed on the east side of the existing facility.

A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, control instrumentation, etc. This generator would be located inside the existing facility.

A water well (approximately 200 – 700 foot deep) would be drilled within the existing pump station property to supply backup water for equipment cooling and lubrication.

DPS #11

DPS 11 is located near Belle Chasse on the east side of the Intracoastal Waterway (see page A-10). This station pumps water from the Intake Canal to the Intracoastal Waterway. The entire perimeter of the exterior wall would be coated with an approved waterproofing material at least to the DFL on the exterior surface.

The doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The doorways and window openings would be modified to accept an approved flood barrier. The entire roof system would be replaced, and the roof trusses would be secured to the foundation by a tethering system. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

The Constant Duty pit and the basement under Pumps C and D would be utilized as leakage collection sumps and would house a larger submersible leakage removal pump. Run dry sump pumps would be placed adjacent to the two horizontal synchronous motor pits. Dry run sump pumps capable of dewatering to below 2” would be installed in motor pits formed by the curb around the motor pit of pumps A and B. In addition all cable entries into the pits would be sealed. The 60 HZ generator electric and diesel air compressors would be raised.

All conduits that penetrate the building below the DFL would by sealed.

Two pump station building generators are proposed to supply 60 HZ power for house lighting, communications, control instrumentation, and to power the proposed station leakage removal pumps. This generator would be located inside the existing facility.

A water well (approximately 200 – 700 foot deep) would be drilled within the existing pump station property to supply backup water for equipment cooling and lubrication.

DPS #12

DPS 12 is located adjacent to the Orleans Marina between Pontchartrain Street and Lakeshore Drive (see page A-11). This station pumps water from the Robert E. Lee and Fleur-De-Lis Canals to Lake Pontchartrain. The entire perimeter of the exterior wall would be coated with an approved waterproofing material at least to the DFL on the exterior surface.

The doorways would be modified to accept an approved flood barrier. The entire roof system would be replaced. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario. In addition, a concrete dike wall would be constructed south of the Pump D motor at least to the DFL.

Two sump pits would be installed in the station floor at the north and south ends of the station that would house the station main leakage removal pumps. The pump motor slab would also be modified to allow for the installation of a sump pit south of the motor. A permanent dike wall would be constructed around the Pump D motor.

All conduits that penetrate the building below the DFL would by sealed.

A power cable will be installed in an existing conduit that runs from DPS#6 under the Southern Railroad track to Bellair Drive. This power cable will connect to an existing cable that runs from Bellair Drive to DPS#12. An alternative source of power will thus be provided to DPS#12. A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, and to power the proposed station leakage removal pumps. This generator would be located inside the existing facility.

A water well (approximately 200 – 700 foot deep) would be drilled south of the pump station within the existing pump station property to supply backup water for equipment cooling and lubrication.

DPS #13

DPS 13 is located near Algiers on the west side of the Intracoastal Waterway. This station pumps water from the Nolan and East Donner Canals to the Intracoastal Waterway (see page A-12). The entire perimeter of the exterior wall would be coated with an approved waterproofing material at least to the DFL on the exterior surface, and all hollow units from the bottom of the masonry to the DFL would be filled with concrete. Since DPS 13 is anticipated to encounter relatively high flood levels, redundant protection of equipment is warranted. Therefore, a permanent curb would be constructed around the motor control center and the Pump 6 and 7 platforms.

The doors would be replaced with storm doors, and the rollup doors would be replaced with hurricane rated units. The doorways and window openings would be modified to accept an approved flood barrier. The rollup doors at the horizontal pump shaft penetrations would require permanent structural steel enhanced water protection modifications and wall height elevation. The below floor handhold and access ways in the vertical pumps would also require sealing. The roof would be replaced. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

The basement under horizontal Pumps 4 and 7 would be utilized as a leakage collection sump pump and would house a larger submersible leakage removal pump. Grated openings in the floor above these locations would be constructed. Small sump pits would be constructed in the two elevated platforms to provide leakage control. The stairs egress would have inflatable seal flood barriers installed. The generator platform slab would be modified to allow for the installation of a sump pit. The two small generators for Pumps 1 and 2 and the two existing

emergency generator exhaust louvers would be raised above the DFL. All conduits that penetrate the building below the DFL would be sealed.

Since this facility is the only station serving Algiers, two 60 HZ back-up generators would be installed to power the pumps. The approximate size of the proposed back-up generators is 3 MW. Required equipment to support the generator are a proposed generator building and installation of an approximate 30,000 gallon fuel tank. Earthen berms and/or fuel containment structures would be constructed in full compliance with applicable regulations to prevent fuel spills or leaks. The design details of the fuel containment structures would be determined during the design phase of the project. The generator and accessories are proposed on the south side of the facility.

A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, and to power the proposed station leakage removal pumps. The pump station building generator would be located inside the existing facility.

A water well (approximately 450 – 700 foot deep) would be drilled within the existing pump station property to supply backup water for equipment cooling and lubrication.

DPS #14

DPS 14 is located east of Lakefront Airport along Hayne Boulevard (see page A-13). This station pumps water from the Morrison and Jahncke Canals to Lake Pontchartrain. This pump station is designed to be placed on automatic control without maintaining operator presence.

The roof trusses would be secured to the foundation by a tethering system. All windows would have manually operated hurricane shutters installed, and the door glass would be replaced with hurricane rated impact resistant glass. All exhaust fans and intakes would be modified or replaced with roll type shutters.

To allow refueling of the diesel fuel tanks, the perimeter fence would be modified to allow tanker access through a higher elevation area that is less likely to flood.

The pump float control system would be replaced with a bubbler type control system. These systems control when the pumps turn on and off. The Entergy transformer would be raised above the design flood elevation.

A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, control instrumentation, etc. This generator would be located inside the existing facility.

A water well (approximately 200 – 700 foot deep) would be drilled within the existing pump station property to supply backup water for equipment cooling and lubrication. Excavated materials would be spread around the site if deemed suitable for disposal.

DPS #15

DPS 15 is located in New Orleans East on the north side of the Intracoastal Waterway (see page A-14). This station pumps water from the Maxent Canal to the Intracoastal Waterway. This pump station is designed to be placed on automatic control without maintaining operator presence.

The doors would be replaced with storm doors, and the roof would be replaced. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. While the steel building frame can be reused, the walls would be replaced with a corrugated steel system rated for a minimum 155 mph wind pressures.

To allow refueling of the diesel tanks, the fuel pipeline would be elevated above the DFL, and an emergency fuel fill pipeline would be extended to the Intracoastal Waterway.

A water well (approximately 200 – 700 foot deep) would be drilled within the existing pump station property to supply backup water for equipment cooling and lubrication.

DPS #16

DPS 16 is located east of Lakefront Airport at the intersection of Wales Street and Danube Road (see page A-15). This station pumps water from the St. Charles Canal to Lake Pontchartrain. This pump station is designed to be placed on automatic control without maintaining operator presence.

The roof trusses would be secured to the foundation by a tethering system. All windows would have manually operated hurricane shutters installed, and the door glass would be replaced with hurricane rated impact resistant glass. All exhaust fans and intakes would be modified or replaced with roll type shutters.

To allow refueling of the diesel tanks, the perimeter fence would be modified to allow tanker access through a higher elevation area that is less likely to flood.

The pump float control system would be replaced with a bubbler type control system. These systems control when the pumps turn on and off. The Entergy transformer would be raised above the design flood elevation.

A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, control instrumentation, etc. This generator would be located inside the existing facility.

A water well (approximately 200 – 700 foot deep) would be drilled within the existing pump station property to supply backup water for equipment cooling and lubrication.

DPS #17

DPS 17 is located on the west side of Almonaster Avenue near the intersection of Florida Avenue and Peoples Avenue (see page A-16). This station pumps water from the Peoples and Florida Avenue Canals to the Mississippi River. DPS 17 is listed as historically significant and is eligible for nomination to the NRHP; therefore, special methods and materials would be utilized to enhance water protection of the entire perimeter of the exterior wall at least to the DFL on the exterior surface.

The doors would be replaced with storm doors, and the rollup doors would be replaced with hurricane rated units. The doorways and window openings would be modified to accept an approved flood barrier. The roof would be replaced, and the roof trusses would be secured to the foundation by a tethering system. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type

shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

As no suitable floor pits are available, troughs would be installed in the floor slab which would drain to an exterior sump and pump. The frequency changers would have a permanent dike built around them, and dry run sump pumps would be placed within the proposed dike.

All conduits that penetrate the building below the DFL would by sealed. Gate 1 and 2 controls would be elevated above the DFL.

A 60 HZ back-up generator would be installed to power the pumps and the S&WB's power grid. The approximate size of the generator is 4 MW. Included with the generator are a proposed generator building, radiator, and two approximate 30,000 gallon fuel tanks. An area exists north of the station for installation of the generator and accessories.

A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, and to power the proposed station leakage removal pumps. This generator would be located inside the existing facility.

A water well (approximately 200 – 700 foot deep) would be drilled to the north of the pump station within the existing pump station property to supply backup water for equipment cooling and lubrication.

DPS #18

DPS 18 is located in New Orleans East north of Chef Menteur Boulevard (see page A-17). This station pumps water from the Village de'l East Lagoon to the Maxent Canal and is designed to be placed on automatic control, so no operating room exists. Some minor mechanical, electrical, and/or miscellaneous protection features may be required at this location. These measures would include, but not be limited to shrouding of electrical equipment, installation of hurricane fencing, installation of drains between existing pits and the installation of a sump pump.

DPS #19

DPS 19 is located on the east side of the IHNC at Florida Avenue (see page A-18). This station pumps water from the Florida Avenue Canal to the IHNC. Since the DFL estimates 11 feet of water above the pump floor, it was not deemed safe or feasible to attempt to provide enhanced water protection for the station superstructure to the full extent of the DFL. It is possible to protect against lower levels of flooding, and the level that can provide enhanced water protection would be determined during the detailed design phase. A concrete dike wall would be constructed along the west edge of the upper equipment level. Exterior doors at this level would be modified, and upper stairway sills would be incorporated into the dike wall.

The doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The roof would be replaced. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters.

Two sump pits would be constructed in the mezzanine floor, and sump pumps would be installed in the lower levels. The potable water booster pump would be replaced with a submersible unit, and the exterior raw water pumping equipment would be enclosed in a

masonry structure. The emergency fuel fill pipeline would be modified to allow filling by barge from the IHNC.

All conduits that penetrate the building below the DFL would be sealed.

A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, control instrumentation, and to power the proposed station leakage removal pumps. This generator would be located inside the existing facility.

Since DPS 19 has backup raw water system, a duplex bag filter would be incorporated to provide suitable water for lubrication purposes.

DPS #20

DPS 20 is located in New Orleans East on the north side of the Intracoastal Waterway east of the IHNC south of Almonaster Boulevard (see page A-19). This station pumps water from Canal Number 1 to the Intracoastal Waterway. This pump station is designed to be placed on automatic control without maintaining operator presence.

All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters.

The fuel fill pipeline would be raised above the DFL. The screen cleaner motor would be elevated above the DFL by incorporating line shafting with a right angle gearbox into the drive train.

The 60 HZ low voltage service cabinet is below the DFL and would therefore require elevating.

The generator building's operating floor and equipment are 9 feet below the DFL; therefore, the existing generator building would be used or a new building constructed in its place above the DFL. The use of the existing building would be evaluated during the design phase; however, if structural implications preclude the use of the existing building, then a new building would be required. All building materials would be disposed of legally and at an approved disposal facility. Any asbestos containing materials that are discovered would have to be removed by the New Orleans SW&B before the USACE and/or its contractors would begin work. This would be completed in conformance with previous and anticipated future Project Cooperation Agreements (PCAs). The exact requirements for the removal and disposal of materials would be determined during the design phase of the project and detailed in the construction plans and specifications.

The existing fuel tank would be augmented with the addition of an approximate 5,000 gallon tank, or the existing tank would be replaced with an approximate 15,000 gallon tank which would allow the generator to run for the required minimum of five days.

A water well (approximately 200 – 700 foot deep) would be drilled within the existing pump station property to supply backup water for equipment cooling and lubrication.

DPS I-10

DPS I-10 is located on the west side of I-10 south of the I-10/I-610 split (see page A-20). This station pumps water from the I-10 underpass at the railroad to the 17th Street Canal. This pump station is designed to be placed on automatic control without maintaining operator presence.

The roof would be replaced. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters.

Emergency fuel piping would be installed along the drainage pump discharge piping to the high point on I-10 as it crosses the 17th Street Canal to allow for remote fuel filling.

The junction box for the sump pump, a pressure transducer, and the exterior lights would be raised.

A pump station building generator is proposed to supply 60 HZ power for control room instrumentation, recorder panels, lighting, communication, and station air conditioning. This would allow the larger generators to be shut down when pumping is not required and allows the station to be powered quickly during the period it takes the operator to bring the main generators on line. This generator would be located inside the existing facility.

A water well (approximately 200 – 700 foot deep) would be drilled within the existing pump station property to supply backup water for equipment cooling and lubrication.

DPS Pritchard

DPS Pritchard is located adjacent to the Monticello Canal south of Airline Highway and north of Earhart Boulevard, at the termination of Pritchard Place (see page A-21). This station pumps water from subsurface drainage to the Monticello Canal. This pump station is designed to be placed on automatic control without maintaining operator presence. The entire perimeter of the exterior wall would be coated with an approved waterproofing material at least to the DFL on the exterior surface. The wet well accesses for the constant duty pump and sluice gates would be sealed.

The doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The doorways would be modified to accept an approved flood barrier. The roof would be replaced, and all exhaust fans and intakes would be modified or replaced with roll type shutters.

A new sump pump would be installed in the vertical pump drywell. Batteries, the generator fuel fill, and fuel vent lines would be raised above the DFL.

The 4,160 volt outdoor switch/fuse enclosure would be elevated above the DFL, and all cable entrance conduit stub ups would be sealed inside the building. The low voltage service cabinet is below the DFL and would therefore require elevating.

A pump station building generator is proposed to supply 60 HZ power for the proposed station leakage removal pumps. This generator would be located inside the existing facility.

Due to the proximity to DPS Monticello, a single common water well to both stations is proposed to supply backup water for equipment cooling and lubrication.

DPS Monticello

DPS Monticello is located adjacent to the Monticello Canal between Airline Highway and Earhart Boulevard, at the termination of Oleander Street (see page A-22). This station pumps water from subsurface drainage to the Monticello Canal. This pump station is designed to be placed on automatic control without maintaining operator presence. The entire perimeter of the

exterior wall would be coated with an approved waterproofing material at least to the DFL on the exterior surface.

The doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The doorways and louvered openings would be modified to accept an approved flood barrier. The roof would be replaced, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

A new sump pump would be installed on the lower pump floor.

All cable entrance conduit stub ups would be sealed inside the building, and the service meter cabinet and wiring would be elevated above the DFL.

A pump station building generator is proposed to supply 60 HZ power for the proposed station leakage removal pumps. This generator would be located inside the existing facility.

Due to the proximity to DPS Pritchard, a single, common water well to both stations is proposed to supply backup water for equipment cooling and lubrication.

DPS Grant

DPS Grant is located in New Orleans East on the north side of the Intracoastal Waterway near Almonaster Boulevard and Interstate 510 (I-510) (see page A-23). This station pumps water from the Grant Street Canal to the Intracoastal Waterway. This pump station is designed to be placed on automatic control without maintaining operator presence. The entire perimeter of the exterior wall would be coated with an approved waterproofing material at least to the DFL on the exterior surface.

The doors would be replaced with storm doors, and the doorways would be modified to accept an approved flood barrier. The roof would be replaced, and all exhaust fans and intakes would be modified or replaced with roll type shutters.

A new sump pump would be installed on the lower pump floor.

A pump station building generator is proposed to supply 60 HZ power for the proposed station leakage removal pumps. This generator would be located inside the existing facility.

A water well (approximately 450 – 700 foot deep) would be drilled is proposed within the existing pump station property to supply backup water for equipment cooling and lubrication.

Carrollton Frequency Changer Building

The Carrollton Frequency Changer Building is located south of Earhart Boulevard at the intersection of Fig Street and Cambronne Street (see page A-24). The entire perimeter of the exterior wall would be coated with an approved waterproofing material at least to the DFL on the exterior surface.

The doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The doorways and louvered openings would be modified to accept an approved flood barrier. The roof would be replaced. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters.

Dry run sump pumps would be installed in the walled Frequency Changer pits and on the lower floor levels.

Old River Intake Pump Station

The Old River Intake Pump Station is located along River Road at the intersection of Oak Street and Monticello Avenue (see page A-25). This station pumps water from the Mississippi River to the Carrollton Water Plant and Power Complex. The entire perimeter of the exterior wall would be coated with an approved waterproofing material at least to the DFL on the exterior surface. In addition, existing leaks in the pump drywell would be sealed by chemical grout injection.

The doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The doorways and louvered openings would be modified to accept an approved flood barrier. The roof would be replaced, and the roof trusses would be secured to the foundation by a tethering system. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, control instrumentation, and to power the proposed station leakage removal pumps. This generator would be located inside the existing facility.

As water seepage enters the facility it would drain to the Pump A through C drywell where existing sump pumps would be augmented with the addition of a new submersible pump.

New River Intake Pump Station

The New River Intake Pump Station is located inside the Mississippi River Levee along River Road at the terminus of Industrial Avenue (see page A-26). This station pumps water from the Mississippi River to the Carrollton Water Plant and Power Complex. The doors would be replaced with storm doors, and the roof would be replaced. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

A pump station building generator is proposed to supply 60 HZ power for house lighting, communications, control instrumentation, and to power the proposed station leakage removal pumps. This generator would be located inside the existing facility.

Carrollton Water Plant and Power Complex

The Carrollton Water Plant and Power Complex is located at the corner of Claiborne Avenue and Monticello Avenue (see page A-27 and Photograph 3). Enhanced water protection would be accomplished by installation of approximately 2,500 feet of a 3 foot to 6 foot high concrete floodwall along the current perimeter fence. The floodwall would be extended around the perimeter of the facility and tied into the existing Monticello levee on the west side of the plant along Monticello Avenue. This proposed floodwall would protect all of the Power Complex and the Water Plant facilities from flood damage which produces clean cooling water for the turbine generators. Should the DFL occur, the barrier would allow continued operation of the power plant, as long as auxiliary facilities such as the Old River and New River Intake Pump Stations remain operational.

Main roadway accesses would be sealed with hinged flood barriers. Water inflated barriers would also be maintained on site for use in the event that flood gate damage prevents their proper operation.

To prevent further water intrusion from entering the Carrollton Water Plant and Power Complex through the existing stormwater drain and sewer lines, valves would be installed at all locations where these lines penetrate the protected perimeter. Select sewer lines would have small sewage stations installed with backflow prevention to allow continued use of bathroom facilities.

Photograph 3. Overall view of Carrollton Water Plant and Power Complex. Photo taken on April 23, 2008.

Leakage and rainwater removal from the site would be accomplished by the installation of self priming diesel engine or electrical driven pump units. These units would use existing drainage manholes for water collection and removal and would be located at numerous locations through the plant.

In addition to flood barrier protection of existing power generation equipment, a flood proof backup 15 MW 13.8KV 60 HZ gas/diesel turbine generator is proposed, along with completion of the 60 HZ feeder to DPS 1. The generator would be located within a new gas turbine building, which is proposed south of the existing gas compressor building along Leonidas Street.

A backup diesel driven water pump is also proposed. This unit would significantly decrease the time required to start the power plant steam generation process from a total plant cold start. This unit would be installed adjacent to boiler #1 and exhaust into the boiler forced draft duct system. A backup diesel drive potable water booster with priming capabilities is proposed in the A and B pump room to provide local water pressure during a total plant cold start.

One 250,000 gallon fuel tank would be constructed in the vicinity of the adjacent to the new gas turbine building in the corner of Spruce Street and Leonidas Street. Earthen berms and/or fuel containment structures would be constructed in full compliance with applicable regulations to prevent fuel spills or leaks. The design details of the fuel containment structures would be determined during the design phase of the project.

During further detailed site investigations and engineering analysis it was determined that the Carrollton Power Plant Complex could be provided with a Perimeter Water Protection system with a much more cost effective approach with all critical power production facilities protected. The location of this revised Perimeter Water Protection system is shown on the revised aerial drawing in Appendix A-27.

The following paragraphs outline specific details of the proposed action for specific buildings within the Carrollton Water Plant and Power Complex.

Central Control Building
The doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The roof would be replaced, and all windows would have manually operated hurricane shutters installed.

Powerhouse #2, 5KV Building, Boiler Room, Low & High Lift Structure
The doors would be replaced with storm doors, and the roof would be replaced. All exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

Gas Compressor Building
The doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The roof would be replaced. All windows would have manually operated hurricane shutters installed, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

Plant Frequency Changer Building
The doors would be replaced with storm doors, and the rollup door would be replaced with a hurricane rated unit. The roof would be replaced, and all exhaust fans and intakes would be modified or replaced with roll type shutters. Buttresses would be constructed to ensure the walls withstand the wind loading scenario.

Construction Sequencing Plan
In order to minimize the impact on the drainage pumping capacity, the projects would be built in a phased construction approach. Due to the available funding limits these proposed projects would be awarded sequentially beginning at the top of the proposed list and proceeding until all appropriated funds have been expended. During the execution of the stormproofing program, this construction sequence plan could be adjusted if operational, engineering, or funding concerns developed. Within the projects currently programmed to be within available funding amounts, adjustments to bidding schedules may occur.

The 4th and 6th Supplementals provided discrete funding amounts. The current budget includes costs for planning, engineering, project management, and construction, as well as an allowance for escalation, inflation and unforeseen construction issues. However, based on actual costs during construction, all of the stormproofing projects currently identified may not be constructed. These projects have been sized to create projects that may appeal to more contractors in order to develop more interest and competition with the goal of achieving lower construction costs. These projects have also been sequenced in order to build as much if not all of the Orleans Parish identified stormproofing needs as possible within the funding constraints of the 4th and 6th Supplementals.

The proposed Construction Plan and associated sequencing was coordinated and developed in detail with the support and concurrence of the Sewerage & Water Board of New Orleans to maximize the amount of work that could be completed and the percentage of the area's drainage system that could be stormproofed given the discrete funding amount available. The following is the proposed Construction Plan in the order that these projects will be awarded and constructed.

The first four projects below primarily stormproof and increase the reliability of the S&WB power production and distribution system for the pump stations in Orleans Parish. The S&WB power

system provides the power to more than half of the pumping capacity in Orleans Parish and is the backbone of the drainage system.

OSP-01: 15 MW 60 Hz Generator at the Carrollton Power Plant

OSP-02: 60 Hz Underground Feeder

OSP-03: Carrollton Power Plant Perimeter Water Protection

OSP-04: Stormproofing Carrollton Power Plant Buildings, Old and New River Stations

The next seven projects (OPS-05, OPS-06, OPS-12/13, OPS-07, OPS-08, OSP 09 and OPS-10) completes the stormproofing of approximately 95% of all pumping capacity within Orleans Parish (see pump station capacities below.) Detail scope related to the stormproofing needs at each of the pump station sites is provided earlier in this section associated with the Proposed Actions.

OSP-05: Stormproofing DPS 5 and 60 Hz Generator: This project provides for the stormproofing of the sole pump station to drain the Lower 9th Ward. Because this system lacks redundancy, the need to complete this project is higher.

OSP-06: Stormproofing DPS 3, 6, and 20 and 60 Hz Generator: This project provides for the stormproofing of three large pump stations. DPS 3 and 6 both take drainage from other pump stations; therefore, stormproofing these stations helps safeguard the drainage capacity for the stations' respective basins. DPS 20 serves a large area of New Orleans East.

OSP-12/13: Stormproofing DPS 13 and 60 Hz Generator: This project provides for stormproofing of a large pump station serving the Algiers area of New Orleans.

OSP-07: Stormproofing DPS 7 and 60 Hz Generator: This project provides for the stormproofing of a large station that takes drainage from other pump stations. Stormproofing this station helps safeguard the drainage capacity of the station's entire basin, including the drainage areas of the smaller pumps that feed into the station.

OSP-08: Stormproofing DPS 1, 2, 4, 12, 19, and I-10: This project provides for the stormproofing of several larger stations serving the central portions of the older sections of New Orleans, Gentilly, Lakeview, and the Upper Ninth Ward. DPS I-10 helps ensure that the hurricane evacuation route of I-10 remains open and does not flood.

OSP-09: Stormproofing DPS 11, 14, and 16: This project provides for the stormproofing of stations serving the English Turn and Lakefront area of New Orleans East.

OSP-10: DPS 17 60 Hz Generator: This project provides for back-up power at a station serving portions of Gentilly and the Upper Ninth Ward.

Based on current construction cost estimates, the generator for DPS 10 described below is within the available funding and that portion of OSP-11 could be constructed. The stormproofing portion of OSP-11 (DPS-10) and the last three projects (OSP-14, OSP-15, and OSP-16) of the program provides for stormproofing of six smaller pump stations that total

approximately five-percent (5%) of the total pumping capacity in Orleans Parish (See pump station capacities below). If construction costs do not escalate and the bidding environment is favorable these projects can be constructed within the available funding. However, if actual costs come in above the current estimates, funding may not be available for a portion if not all of these projects below. The need to stormproof these pump stations is less in comparison to the needs of the other pump stations in the New Orleans pump station system.

OSP-11: Stormproofing DPS 10 and 60 Hz Generator:
This project provides for stormproofing DPS 10 and provides for 60 Hz generator power. DPS 10 is one of three stations that serve the Lakefront area of New Orleans East. This station receives partial back-up power from DPS 14 and DPS 16. Drainage flow along the New Orleans East lakefront area is shared by DPS 10, 14, and 16. Flow to any of these stations can be diverted to the other two stations. Therefore the need to stormproof DPS 10 is less than the stations stormproofed in OSP-01 through OSP-10.

OSP-14: Stormproofing DPS 17:
This project provides for stormproofing DPS 17. DPS 17 serves portions of Gentilly and Upper 9th Ward. A generator will be added to DPS 17 as part of OSP 10 which is currently projected within the available funding. Flow from DPS 17 can be diverted to DPS 19 that was stormproofed earlier in this sequence and therefore the need to stormproof DPS 17 is less.

OSP-15: Stormproofing Carrollton Frequency Changer Building:
This project provides for stormproofing the Carrollton Frequency Changer Building. This 25 Hz frequency changer building distributes power to many pump stations requiring 25 Hz power. This is a back-up secondary distribution system for the 25 Hz power and therefore the need to stormproof this facility is less critical.

OSP-16: Stormproofing DPS 15, 18, Grant, Monticello, and Pritchard:
This project provides for stormproofing DPS 15, 18, Grant, Monticello and Prichard. These five pump stations are run automatically and house no operational personnel during a storm event. DPS 15 serves the industrial areas in the extreme eastern portion of New Orleans East and was not flooded during Hurricane Katrina. DPS 18 is a small open-air pump station that serves a portion of extreme eastern portion of New Orleans East. Flow from DPS 18 can be diverted to DPS 15 and therefore the need to stormproof this pump station is reduced. Also DPS 15 and 18 were operational after Hurricane Katrina. DPS Grant is a newer small station that serves a portion of lower New Orleans East. Grant pump station was restored to functional capacity quickly after Hurricane Katrina. Elaine pump station has not been included in the stormproofing program because the two pumps for this station are being completely replaced in the USACE pump station repair program. Flow from Grant pump station can be diverted to DPS 20 and Elaine pump station and therefore the need to stormproof Grant pump station is less than Elaine and DPS 20. Monticello and Pritchard pump stations serve the Hollygrove area of New Orleans. Pritchard pump station is a robust new station that was constructed under the SELA program. Monticello pump station is also a newer pump station that was constructed to more recent stronger design standards. Monticello and Pritchard pump stations sustained only minor damage during Hurricane Katrina. Drainage flow can be diverted from Monticello pump station to the Pritchard pump station and therefore the need to stormproof Monticello pump station less than Pritchard. Pritchard pump station has back-up generator power and because this station was recently constructed, the need to stormproof this station is less others in the system.

The table below shows the total drainage pumping capacity for Orleans Parish by area and pump station.

Capacity of Orleans Parish Pump Stations

Pump Station	Number of Pumps	Horizontal Pumps	Vertical Pumps	Constant Duty Pumps	Design Capacity (cfs)	25 Hz Capacity (cfs)	Diesel Capacity (cfs)	60 Hz Capacity (cfs)
Metro Orleans East Bank Total Pumping Capacity 36,327 cfs								
PS #1	11	7	2	2	6,825	4,625		2,200
PS #2	7	4		3	3,190	3,190		
PS #3	9	5		4	4,260	4,260		
PS #4	6	3	2	1	3,720	3,080		640
PS #6	15	9	4	2	9,480	6,280		3,200
PS #7	5	3		2	2,690	1,690		1,000
PS #12	1	1			1,000	1,000		
PS #17	2		2		300			300
PS #19	5	3	2		3,650			3,650
I-10	4		4		860			860
Monticello	3		3		99			99
Prichard	2		2		253			253
Lower Ninth Ward Total Pumping Capacity 1,860 cfs								
PS #5	8	2	2	4	1,860	1,260		600
Lower Algiers/English Turn Total Pumping Capacity 1,670 cfs								
PS #11	5	4		1	1,670	500		1,170
Algiers Total Pumping Capacity 4,650 cfs								
PS #13	7	4	2	1	4,650		2000	2,650
New Orleans East Total Pumping Capacity 4,862 cfs								
PS #10	4		4		1,000			1,000
PS #14	4		4		1,200			1,200
PS #15	3		3		750		++ 500	750
PS #16	4		4		1,000			1,000
PS #18	2		2		150			150
PS #20	2		2		500			500
Grant	6		6		172			172
Elaine	2		2		90			90
Total	117	45	52	20	49,369	25,885	2,500	21,484

ALTERNATIVES TO THE PROPOSED ACTION

Three alternatives to the proposed action were considered. These alternatives were: No-action; Non-structural and Alternative 1.

In order to meet the project purpose and need, an alternative must provide the following facilities criteria for stormproofing. Facilities must provide alternative sources of power to ensure the pump stations can continue to operate when the primary power source fails. Facilities must be strengthened to help ensure they will allow continued pumping operations under storm or hurricane conditions. Facilities must provide additional protection for pump operators, during tropical storm events. Facilities must allow quick access to pumps for immediate pump maintenance to help ensure the pumps would continue operation during storm events. Facilities must provide for adequate manpower to fully operate and maintain the pump stations and operations during all tropical storm events.

In addition to the above listed screening criteria, environmental factors were also used to evaluate alternatives to the proposed action. Environmental factors are important issues or concerns recognized by regulatory agencies, or those conditions that must be met to minimize potential impacts to the environment associated with the Proposed Action.

NO ACTION ALTERNATIVE

The President's Council on Environmental Quality's (CEQ) regulations and USACE's ER for implementing NEPA require that a No Action alternative be evaluated. Under the No Action alternative, the CEMVN would not conduct any stormproofing activities at the 22 DPS, the Carrollton Frequency Changer Building, the Old River Intake Station, the New River Intake Station, or the Carrollton Water Plant and Power Complex. Under the no-action alternative, the proposed action would not be constructed by the MVN. With implementation of the No Action Alterative, no changes to the existing facilities and/or structures would occur. All of the facilities would continue to operate in their current manner; therefore, there would be no impacts to any resources.

Therefore, immediately prior to a large tropical storm making landfall and affecting Orleans Parish, the pump operators would be evacuated to a safer location, such as a hospital or Parish facility. Storm water removal during a major tropical storm relies upon equipment that can continue to operate during a flood event with an adequate number of pump operators to maintain the equipment. Without stormproofing activities, the majority of the facilities would remain inoperable during the passage of the tropical storm as they did with Hurricane Katrina and would only come online when conditions are safe for the pump operators to return to the pump stations and initiate station operation.

NON-STRUCTURAL ALTERNATIVE

Section 73 of the Water Resources Development Act of 1974 requires that non-structural alternatives be evaluated in flood damage reduction studies. ER 1105-2-100 provides planning guidance on applicable non-structural measures. Non-structural flood damage reduction measures typically include permanent relocation, evacuation, or demolition of structures in the floodplain; flood proofing of structures; flood warning systems; and regulation of floodplain uses. The average annual cost of implementing nonstructural measures such as flood proofing by raising individual homes and businesses within Orleans Parish exceeded the projected average annual benefits and the amount allocated to this project. Other non-structural measures such

as permanent relocation, demolition of inhabited structures, or regulation of floodplain use are not within the authority of the MVN. Additionally, flood warning systems and evacuation plans are already in place in Orleans Parish.

The relocation of the safe houses to the exterior of the pump stations was considered as an alternative but was eliminated from further consideration. The relocation of the safe houses to the exterior of the pump station does not meet the purpose and need of the project because it would require the absence of the operators from the pump stations during a storm event. Although any equipment can be made to be fully automated, the existing state of the equipment operated by the S&WB is not economically feasible to automate. In addition the S&WB prefers that their operators remain in the pump station building during hurricane and storm events to operate the pumps and be immediately available to monitor the system and respond to electrical and mechanical equipment needs as these arise. In order to operate the pump stations and immediately resolve operational problems, SW&B personnel must be located within these facilities. If SW&B personnel are not present to operate the pump stations in order to remove flood waters and immediately resolve operational problems, then flood waters could threaten the lives, health, and property of the city's residents.

The benefit of these non-structural alternatives does not satisfy the purpose and need of the project or provide viable alternatives to the proposed action, but such non-structural measures could compliment the proposed action. Therefore, the Non-Structural Alternative was eliminated from further consideration.

ALTERNATIVE 1: PROVIDE ADDITIONAL REDUNDANT PROTECTION FOR PUMP STATIONS

Alternative 1 provides the same features as the Proposed Action has and includes additional features which provide redundant protection for two aspects of the stormproofing. Alternative 1 provides the redundant protection feature of hardened interior operator control rooms within the DPS buildings to help maintain operator presence during and after the storm. The Proposed Action relies on the structural improvements to the DPS themselves to provide for safe haven of the operators and thereby reliable operator presence. Alternative 1 would rely on the increased protection provided by the DPS strengthening and the redundant feature of hardened interior operator control rooms to provide safe haven for the operators.

Photograph 4. Operator control room at DPS 1. Photo taken on April 22, 2008.

The second additional stormproofing measure is in the method that individual pumps and other equipment within the DPS are provided protection from water exposure. The Proposed Action relies on either the structural features applied to and on the DPS to enhance the water protection provided by these water intrusion protection features or the existing elevation of some equipment to provide protection from the water. Alternative 1 utilizes the redundancy of additional water protection features for select pumps and equipment by surrounding these pumps and equipment with dikes or curbs or raising these pumps and equipment.

Detailed descriptions of the additional actions proposed at each DPS are detailed on the following pages.

DPS #1

Alternative 1 would replace the existing control room (Photograph 4) at its current location with a new elevated hardened masonry structure. Electrical improvements include raising most of F and G pump accessories above the DFL; relocating the switchgear for these pumps to a new elevated structure; raising the reactors and rheostats for pumps C, D, and E; raising the MCC1, T1, and resistors for constant duty pump 2; and raising the batteries, chargers and switches for pumps A, B, C, D, and E. Mechanical improvements include modifying inboard bearings' housing for all the horizontal pump units to allow for compressed air pressurization and elevating vacuum pump unit for Pump 5 on a concrete foundation above the DFL.

DPS #2

Alternative 1 would replace the existing control room at its current location with a new elevated hardened masonry structure. Electrical improvements include elevating the reactors for pumps C and D. Mechanical improvements include modifying inboard bearings' housing for all the horizontal pump units to allow for compressed air pressurization and enclosing pump D in a shroud similar to the existing unit at DPS 3 to provide redundant protection.

DPS #3

Alternative 1 would replace the existing control room at its current location with a new floodwall type hardened reinforced concrete/masonry structure. Electrical improvements include elevating the 6,600 volt switchgear onto a four inch housekeeping pad; elevating and relocating reactors for pumps A, B, C, D and E; elevating and relocating rheostats for pumps C, D and E; elevating and relocating power cabinets T1, T2, and T3, transfer switches, transformers T1, T2, and T3 to the new building; and elevating 125DC switchgear onto a four inch housekeeping pad. Other improvements include relocating basement equipment to a new 20 foot by 60 foot station addition located along Florida Avenue north of the west side of the station (Photograph 5). Mechanical improvements include installing a curb around the Pump D motor pit, installing a dry run sump pump in the pit, and sealing all cable entries. A small sump pump could be installed in the curbed rheostat/reactor pit to remove any leakage through the barrier, the inboard bearings' housing for all the horizontal pump units would be modified to allow for compressed air pressurization, and split wiper type seals would be installed on the outboard bearing of Pump D.

Photograph 5. Possible location of 20'x60' structure at DPS 3. Photo taken on April 23, 2008.

DPS #4

Alternative 1 would replace the existing control room at its current location with a new elevated hardened masonry structure. Electrical improvements include elevating the resistor banks for pumps C, D, and E; the constant duty pump control cabinet; and the rectifier for pumps 1, 2, C, D, and E. Mechanical improvements include removing gearboxes and modifying and installing mechanical seals or wiper type seals; protecting outboard bearings' housing with new wiper seals; modifying inboard bearings' housing

for all the horizontal pump units to allow for compressed air pressurization; replacing screen cleaner motor and gear for Pumps A and B with vertical input/horizontal output gear and motor; and elevating the gear motor drive for Pumps C, D, and E.

DPS #5

Since the DFL projects nine feet of water on the existing older station pump floor, it was not deemed safe or feasible to provide enhanced water protection for the station superstructure to the full extent of the DFL. Under Alternative 1, the existing control room could be converted into a floodwall type room with the floor being elevated 3 feet above the existing DFL, leaving it still below the projected DFL. Structural modifications include constructing a new 3,100 square foot structural steel mezzanine above the DFL in the original station, supporting the new horizontal pump vertical motors with concrete walls/columns with the rest of the structure being supported by steel members, and replacing the flooring with steel grating. Electrical improvements include elevating all of the electrical equipment to the new mezzanine level. Mechanical improvements include replacing Pumps A and B motors with a right angle gearbox and vertical 25 HZ motor. The new gearbox would be designed for submersion. The new motors would be located above the DFL. One of the two vacuum pumps, the two motor-generator sets, and the diesel driven air suppression blower and electric air compressor could be elevated to the mezzanine.

DPS #6

Alternative 1 would replace the existing control room at its current location with a new hardened masonry structure. Electrical improvements would include mounting the base of some of the equipment on a pad or channel footing that would elevate it between 3 inches and 4 inches above the floor. Mechanical improvements include replacing the gearbox output shaft oil seals on Pumps H and I with more watertight units, modifying the outboard bearings for Pumps H and I to accept split wiper type seals, and modifying inboard bearings' housing for all the horizontal pump units to allow for compressed air pressurization

DPS #7

Alternative 1 would replace the existing control room at its current location with a new flood wall type hardened reinforced concrete/masonry structure. Electrical improvements include raising the basement electrical equipment above the DFL. Some of the equipment would be relocated to the proposed generator building. Mechanical improvements include replacing the Pump D gearbox output shaft oil seals with more watertight units and modifying inboard bearings' housing for all the horizontal pump units to allow for compressed air pressurization.

DPS #8 and #9

These DPS no longer exist. They have been previously phased out of the system, so no improvements or alternatives are proposed.

DPS #10

Alternative 1 would replace the existing control room windows with impact resistant units. The existing concrete roof could be thickened with the addition of concrete panels up to a maximum of 15" thick.

DPS #11

Alternative 1 would modify the existing control room to raise equipment and personnel above the DFL with the installation of a raised access panel floor. Walls could have enhanced water protection provided and the door sill could be raised above the DFL. All windows could be replaced with impact resistant units, and the existing concrete roof would be thickened with the addition of concrete panels up to a maximum of 15 inches thick. The separate, adjacent

bathroom and walkway between it and the control room could also be elevated. Electrical improvements include raising breaker T1 and T2, the 480 volt switchgear, and the switchgear for Pumps A and B. Mechanical improvements include equipping the output shaft of the Pump D and E gearboxes with a mechanical seal, installing new split wiper seals on Pumps D and E outboard bearings, and modifying inboard bearings' housing for all the horizontal pump units to allow for compressed air pressurization.

DPS #12
Alternative 1 would replace the existing control room at its current location with a new elevated hardened masonry structure. Mechanical improvements include removing gearboxes and modifying and installing mechanical seals or wiper type seals, raising the hydraulic pump above the DFL, protecting the outboard bearing with new wiper seals, and modifying the inboard bearings' housing for all the horizontal pump units to allow for compressed air pressurization.

DPS #13
Alternative 1 would replace all windows in the operator room with impact resistant units. The existing concrete roof could be thickened with the addition of concrete panels up to a maximum of 15 inches thick. Mechanical improvements include modifying inboard bearings' housing for all the horizontal pump units to allow for compressed air pressurization, raising the motor for Pumps 1 and 2 above the DFL, and replacing bearings for Pumps 1 and 2 with split bearings.

DPS #14
Alternative 1 would retrofit the existing tank slab to provide for elevated tanks.

DPS #15
Alternative 1 would replace the intermediate bearing on Pump 2 with a split cooper type unit and require heavily greasing all intermediate bearings prior to a storm event.

DPS #16
Alternative 1 would retrofit the existing tank slab to provide elevated tanks.

DPS #17
The existing control room could be replaced at its current location with a new hardened masonry structure. Electrical improvements include raising the rheostat for frequency changer number 1 onto a four-inch housekeeping slab and relocating the external 4,160 volt switchgear to an elevated platform. Two alternative locations for the switchgear would be evaluated during the design phase of the project. The first alternative would locate the switchgear inside the existing pump station building. If it is determined that locating the switchgear inside the existing building is not technically feasible, then a separate building adjacent to the pump station, but within pump station property, would be constructed based on underground utilities. There are significant underground utilities at this location and until the architect/engineer designing the facility can conduct site surveys, gather historical drawings from the SW&B, and contact the utility companies, the exact location of this building cannot be determined. The exact location of the proposed building would be determined during the design phase of the project.

Mechanical improvements include raising the water booster pump to the mezzanine level.

DPS #18
Since this is an open air, outdoor station on a platform directly over the intake canal, there is no building to waterproof. The only alternative is to raise the platform in place above the DFL. Mechanical improvements include elevating the bubbler air compressor above the DFL.

DPS #19

All windows in the existing operator room could be replaced with impact resistant units. The existing concrete roof could be thickened with the addition of concrete panels up to a maximum of 15 inches thick. Structural improvements include constructing a concrete dike wall along the west edge of the upper equipment level within the existing building, modifying exterior doors at this level, and incorporating upper stairway sills into the dike wall. Electrical improvements include relocating the rectifier to a higher elevation. Mechanical improvements include fitting gearboxes for horizontal pumps 1, 2, and 3 with new mechanical seals; elevating horizontal pumps 1, 2, and 3, electric oil pump, related pressure switches, and flow indicators above the DFL; fitting horizontal pumps 1, 2, and 3 outboard bearings with wiper type seals; modifying inboard bearings' housing for all the horizontal pump units to allow for compressed air pressurization; and replacing intermediate bearings for the vertical pumps with split Cooper type.

DPS #20

All windows in the existing operator room could be replaced with impact resistant units. The through the wall air conditioning unit could be stabilized with structural steel.

DPS I-10

All interior windows in the existing masonry operator room could be replaced with impact resistant units. The existing concrete roof could be thickened with the addition of concrete panels up to a maximum of 15 inches thick, or as much as existing walls allow. An approximate 15,000 gallon fuel tank could be installed on-site to provide capacity for the minimum five days of operation. The location of the proposed fuel tanks would be determined based on underground utilities. There are significant underground utilities at this location and until the architect/engineer designing the facility can conduct site surveys, gather historical drawings from the SW&B, and contact the utility companies, the exact location of this building cannot be determined. The exact location of the fuel tanks would be determined during the design phase of the project.

DPS Pritchard

Alternative 1 would include the installation of a new sump pump in the vertical pump drywell, replacing the intermediate bearings for Pumps 1 and 2 with easy-repair split radial bearings, and raising the generator air compressors and valves.

DPS Monticello

Alternative 1 would include the installation of a new sump pump on the lower pump floor and sealing the steady and pump bearings with split wiper seals.

DPS Grant

There is a combination open air outdoor station with a building around two pumps on a platform directly over the intake canal to waterproof. The only alternative is to raise the station platform in place above the DFL. Structural improvements include installing a new sump pump on the lower pump floor. Mechanical improvements include raising the motors on the exterior units which could require motor ring base and intermediate shaft modification, raising vacuum Pumps 1 and 2 on a concrete foundation above the DFL, and replacing the sub floor bearings for Pump 5 and 6 with split cooper type bearings.

Carrollton Frequency Changer Building
Alternative 1 would provide floodproofing for the electrical equipment by elevating the following equipment above the DFL: resistor bank, outdoor transformers, outdoor switchgear, the air conditioning and heating, and rheostats.

Old River Intake Pump Station
Alternative 1 would provide floodproofing for the electrical equipment by elevating the following equipment above the DFL: outdoor switchgear, the 6,600 and 3,300 volt transformers, and booster pumps.

New River Intake Pump Station
There are no redundancy improvements being considered for the New River Intake Pump Station under Alternative 1**.**

Carrollton Water Plant and Power Complex
Water proofing the perimeter of the Carrollton Water Plant would eliminate the need for any further flood proofing within the plant flood barrier. Therefore, there are no redundancy improvements being considered for the Carrollton Water Plant and Power Complex.

ENVIRONMENTAL SETTING

GENERAL

The 22 DPS, the Carrollton Frequency Changer Building, the Old River Intake Pump Station, the New River Intake Pump Station, and the Carrollton Water Plant and Power Complex are located within and around the City of New Orleans in Orleans Parish, Louisiana. The land use at each of these stations, where modifications are proposed, is developed and/or ubanized. Even those DPS that occur in relatively isolated areas (*i.e.* DPS 11, 13, 15, 18, 20 and Grant), are located on canal banks and levees, which are developed or regularly maintained.

CLIMATE

Extreme rainfall events are common along the Gulf Coast. The most damaging non-tropical rainfall event in Metropolitan New Orleans occurred on May 8 and 9, 1995. On the night of May 8, 1995, 12.4 inches of rain was recorded at New Orleans International Airport, and a maximum of 24.5 inches of rain was reported for the two day period at Abita Springs, Louisiana. The rainfall event lasted 40 hours and damaged 44,500 homes and businesses (National Oceanic and Atmospheric Administration [NOAA] 2007).

Tropical storms typically produce the highest wind speeds and greatest rainfall events along the Gulf Coast. Category 5 hurricanes, such as Hurricane Camille which made landfall just east of New Orleans on August 17, 1969, generate the highest sustained wind speeds in the region (greater than 155 miles per hour). The high winds are typically accompanied by massive storm surge, and in the case of Category 5 storms, storm surge exceeds 18 feet in height (National Hurricane Center 2008). Between 1926 and 2005, a total of 14 hurricanes (Category 1-5) have struck Orleans Parish (National Hurricane Center 2008). The frequency of hurricanes is greatest between August and October; however, hurricane season is from June 1 through November 30 (National Climate Data Center 2007). Prior to Hurricane Katrina in 2005, Hurricane Betsy, on September 9, 1965, was the most damaging tropical storm in Metropolitan New Orleans. Hurricane Betsy caused a storm surge of 10 feet, flooding large parts of the city,

claiming 81 lives and causing $1 billion in damage (NOAA 2007). No impacts to regional climate would occur due to the Proposed Action.

SOILS

Available soil data for the areas comprising the 22 DPS, the Carrollton Frequency Changer Building, the Old River Intake Pump Station, the New River Intake Pump Station, and the Carrollton Water Plant and Power Complex are found in the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey of Orleans Parish (USDA 1986). Soil types found at the 26 facilities include: Allemands muck, drained (Ae); Aquents, dredged (An); Aquents, dredged, frequently flooded (AT); Commerce silty clay loam (Co); Commerce and Sharkey soils, frequently flooded (Cs); Harahan clay (Ha); Sharkey clay (Sk); Urban land (Ub); and Westwego clay (Ww).

Only temporary disturbance to soils could occur as a result of the Proposed Action. Following stormproofing activities, all disturbed areas would be re-vegetated with turf grass to prevent soil erosion.

Important farmlands, including lands identified with soils that are prime and unique or soils of statewide and local importance are subject to the provisions of the Farmland Protection Policy Act of 1981. Commerce, Harahan and Sharkey are classified as prime farmland soils. Because the Proposed Action is located in an urbanized area, the facilities are previously developed, and the lands are not utilized for agricultural production, the project is not subject to the requirements of the Farmland Protection Policy Act. No impacts to prime and unique soils would occur due to the Proposed Action.

IMPORTANT RESOURCES

This section contains a description of important resources that could potentially be impacted, and a discussion of the impacts of the Proposed Action and alternatives to the Proposed Action on these resources. The following important resources are those recognized by laws, executive orders, regulations, and other standards of Federal, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public.

The important resources described in this section are land non-wetland/upland, fisheries, wildlife, endangered or threatened species, cultural resources, recreational resources, aesthetics, noise, air quality, social and economic, and transportation. Although water quality, essential fish habitat, fisheries, wetlands and water bodies are institutionally and technically important resources, the Proposed Action is located in upland areas and along canal banks. The water quality of canals and adjacent water bodies (*i.e.* Mississippi River, Lake Pontchartrain, Intracoastal Waterway, Mississippi River Gulf Outlet) would not be affected because operations of the pumps would not change. Standard construction and operation requirements, measures to improve water quality, and permits by the state of Louisiana are in place to regulate and monitor water quality of the drainage basins; therefore, these resources will not be subject to further analysis. The land based nature of the Proposed Action would not cause any impacts to essential fish habitat, wetlands, or water bodies; therefore, these resources will not be subject to further analysis.

NON-WET LAND RESOURCES / UPLAND RESOURCES

These resources are institutionally important because of the Food Security Act of 1985, as amended; the Farmland Protection Policy Act of 1981; and the Fish and Wildlife Coordination Act of 1958, as amended. These resources are technically important because of the habitat provided for both open and forest-dwelling wildlife and the provision or potential for provision of forest products and human and livestock food products. These resources are publicly important because of their present economic value or potential for future economic value.

Existing Conditions

All of the DPS, the Carrollton Frequency Changer Building, the Old River Intake Pump Station, the New River Intake Pump Station, and the Carrollton Water Plant and Power Complex are located within levees, canals, and/or the urbanized area of the City of New Orleans. The vegetation at these locations consists of maintained and unmaintained lawn and turf grasses, such as Bermudagrass (*Cynodon dactylon*), Johnsongrass (*Sorghum halepense*), and Japanese brome (*Bromus japonicus*). Little to no woody vegetation (*i.e.* trees and shrubs) exists at the majority of the facilities. The Carrollton Water Plant and Power Complex does contain scattered trees such as sugarberry (*Celtis laevigata*), live oak (*Quercus virginiana*), and bald cypress (*Taxodium distichum*).

Future Conditions with No Action

No change in upland resources would occur under the No Action alternative because no construction activities would take place. All of the locations would continue to be maintained as canal banks, including regular mowing of turf grasses.

Future Conditions with the Proposed Action

Due to the construction of pump station generator buildings and the drilling of new water wells at several DPS and the construction of a perimeter wall at the Carrollton Water Plant and Power Complex, uplands could be disturbed as a result of the Proposed Action. However, all of these areas are located at existing facilities and are comprised of maintained lawn and turf grasses. A few trees at the Carrollton Water Plant and Power Complex could be removed due to the installation of the 6,300 foot perimeter wall and the construction of a new gas turbine building. The trees consist of planted bald cypress, hackberry (*Celtis laevigata*), and live oak (*Quercus virginiana*). Depending on the specific design details of the perimeter wall and location of the new gas turbine building, up to 9 planted bald cypress trees (average diameter-at-breast-height [dbh] 11.8 inches), 5 live oak trees (average dbh 40 inches), and a few small hackberry trees (3 to 6 inch dbh) could be impacted. Additionally, the neutral ground on Earhart Blvd between Eagle and Pine Streets will also be disturbed due to the installation of a ductbank. Trees specimens in the Earhart area include a variety of palms, oaks and crape myrtles that reside in the right-of-ways along the streets and corridors. The majority of these street plantings are in poor condition due to negligible maintenance and/ or storm damage and would not be a considerable loss if they were in any way disturbed. The majority of these trees will not be affected by the proposed action. The loss of the live oaks would be avoided to the maximum extent practicable through tree protection measures. If it becomes necessary to remove any live oaks, these trees would be replaced on an inch to inch basis. As a final note, no upland habitats that are rare or unique would be disturbed as a result of the Proposed Action.

Future Conditions with Alternative 1

The actions proposed under Alternative 1 that could potentially impact upland resources includes the construction of 20 foot by 60 foot station addition at DPS 3 and the construction of a 32 foot by 32 foot elevated electrical building at DPS 6. As a result, uplands could be disturbed. The impacts of Alterative 1 would be greater than the Proposed Action because additional structures would be constructed; however, all of the proposed construction would occur at existing facilities in highly disturbed areas.

WILDLIFE

This resource is institutionally important because of the Fish and Wildlife Coordination Act of 1958, as amended and the Migratory Bird Treaty Act of 1918. Wildlife resources are technically important because they are a critical element of many valuable aquatic and terrestrial species; they are an indicator of the health of various aquatic and terrestrial habitats; and many species are important commercial resources. Wildlife resources are important to the general public because of the high priority that the public places on their esthetic, recreational, and commercial use.

Existing Conditions

The facilities proposed for stormproofing are all disturbed, the majority are paved and devoid of native vegetation, and all are located within urban or semi-urban areas behind hurricane, storm, and flood damage reduction levees within the Orleans Parish drainage area. The majority of wildlife species that could be present are those commonly found in urban and developed areas including a variety of transient and resident urban wildlife species such as rodents (rats, mice, squirrels, nutria [*Myocaster coypus*]), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), nine-banded armadillo (*Dasypus novemcinctus*), house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), cattle egret (*Bulbulcus ibis*) common grackle (*Quiscalus quiscula*), and American crow (*Corvus brachyrhynchos*).

Future Conditions with No Action

No direct or indirect impacts to wildlife would be anticipated under the No Action Alternative. The facilities receive very little wildlife use because they are highly developed and primarily located in urban or semi-urban areas, and normal pump station operations do not impact wildlife in adjacent estuaries.

Future Conditions with the Proposed Action

With implementation of the Proposed Action, no direct or indirect impacts to wildlife would be anticipated because all construction activities would be temporary, conducted during daylight hours, and are proposed within previously developed areas. No unique or rare habitats would be disturbed. Furthermore, no changes in normal pump station operations would occur; therefore there would be no impacts from regular operations to adjacent estuaries.

Future Conditions with Alternative 1

The impacts from implementation of Alternative 1 would be the same as those described for the Proposed Action.

ENDANGERED OR THREATENED SPECIES

This resource is institutionally important because of the Endangered Species Act of 1973, as amended; the Marine Mammal Protection Act of 1972; and the Bald Eagle Protection Act of 1940. Endangered or threatened species are technically important because the status of such species provides an indication of the overall health of an ecosystem. These species are publicly important because of the desire of the public to protect them and their habitats.

Existing Conditions
Threatened and endangered species potentially occurring within the project areas include the bald eagle, brown pelican, West Indian manatee, Gulf sturgeon, and pallid sturgeon. The Proposed Action would occur on previously disturbed areas and no habitat for the listed species occurs in the project area. None of the proposed activities would occur within the aquatic environments of the project area. Implementation of the Proposed Action would result in minimal to no effect to the natural environment; therefore, it is the conclusion of the project team that the alternatives under consideration would have no adverse effect on these protected species.

Future Conditions with No Action
Under the No Action Alternative, no adverse effects to threatened or endangered species or critical habitat would be anticipated because there would be no construction or change in condition within the project area.

Future Conditions with the Proposed Action
Since the Proposed Action would occur on previously disturbed areas, the majority of which are paved or consist of maintained lawn and turf grasses, no unique or rare habitats would be disturbed. Implementation of the Proposed Action would result in minimal to no effect to the natural environment; therefore, there would be no adverse effect on protected species.

All proposed activities are land based and therefore would have no effect on marine species.

The Proposed Action was reviewed by the U.S. Fish and Wildlife Service (USFWS) via a letter dated May 9, 2008. As a result of this review, MVN and USFWS jointly concluded that the Proposed Action is not likely to adversely affect any threatened or endangered species or their critical habitat (USFWS fax dated May 13, 2008). A copy of this letter is included in Appendix B.

Future Conditions with Alternative 1
Based on the fact that the Alternative 1 would occur on previously disturbed areas and implementation of Alternative 1 would result in minimal to no effect to the natural environment, there would be no adverse effect on protected species.

CULTURAL RESOURCES

This resource is institutionally significant because of: the National Historic Preservation Act of 1966, as amended; the Native American Graves Protection and Repatriation Act of 1990; and the Archeological Resources Protection Act of 1979; as well as other statutes. Cultural resources are technically significant because of: their association or linkage to past events, to historically important persons, and to design and/or construction values; and for their ability to yield important information about prehistory and history. Cultural resources are publicly

significant because preservation groups and private individuals support their protection, restoration, enhancement, or recovery.

Existing Conditions
There are seven Drainage Pump Stations that are considered eligible for the National Register of Historic Places. These are DPS 1, 2, 3, 5, 6, 7, and 17. Site visits along with literature and records review including consultation of the Louisiana Division of Archaeology's site file database, site maps, and survey maps lead to this knowledge and conclusion. DPS 5 and 17 are not considered eligible as individual buildings, but rather are considered eligible for their parts in a Historic Drainage District that protects the entire city and for their engineering component contribution to drainage of New Orleans. All other DPS have been determined to not be historic resources and therefore there is no concern with maintaining their historic integrity via storm proofing modifications being considered.

Future Conditions with No Action
Under the No Action alternative, a serious flood event could overwhelm or destroy the drainage pumping stations. Loss of these pumping stations would result in further flooding and destruction of adjacent properties, including historic areas and historic buildings.

Future Conditions with the Proposed Action
With implementation of the Proposed Action, drainage pump stations would be able to withstand a flood event, and would be better able to drain waters and protect areas of the city. Those DPS that are considered historic and eligible for the National Register of Historic Places, will be storm proofed with careful measures that respect the historic integrity of the building and minimize any aesthetic alteration to the exteriors. The Louisiana State Historic Preservation Officer has reviewed plans for storm proofing of the historic DPS and has issued a statement of no adverse impacts, in a letter dated January 5, 2009.

Future Conditions with Alternative 1
The impacts from implementation of Alternative 1 would be the same as those described for the Proposed Action.

RECREATIONAL RESOURCES

This resource is institutionally important because of the Federal Water Project Recreation Act of 1965, as amended, and the Land and Water Conservation Fund Act of 1965, as amended. Recreational resources are technically important because of the high economic value of recreational activities and their contribution to local, state, and national economies. Recreational resources are publicly important because of the high value that the public places on fishing, hunting, and boating, as measured by the large number of fishing and hunting licenses sold in Louisiana and the large per-capita number of recreational boat registrations in Louisiana.

Existing Conditions
Recreational opportunities in the vicinity of the facilities include City Park near DPS 7, Pratt Park near DPS 4, and the Mississippi River Trail near the Old River and New River Intake Stations.

Future Conditions with No Action
Under the No Action alternative, flooding of recreational areas in the project area during severe tropical storm events could occur. Flooding could limit recreational use during the duration of

the flooding episode, as well as potentially reducing recreational capacity after flood waters recede due to possible damage to park infrastructure.

Future Conditions with the Proposed Action
With implementation of the Proposed Action, there would be no impacts to adjacent and nearby recreational resources. No construction activities would take place outside of the existing facility boundaries, except the proposed underground ductbank (Associated with DPS #1) along Earhart Boulevard. Flooding during major tropical storm events would be minimized as Orleans Parish pumps would be able to operate during and immediately following the storm event. Recreational resources would still remain unusable during extreme weather events; however, the Proposed Action would minimize the damage to Orleans Parish parks' infrastructure from large-scale flooding.

Future Conditions with Alternative 1
The impacts from implementation of Alternative 1 would be the same as those described for the Proposed Action.

AESTHETICS (VISUAL RESOURCES)

This resource's institutional significance is derived from laws and policies that affect visual resources, most notably the National Environmental Policy Act of 1969, the Coastal Barrier Resources Act of 1990, Louisiana's Natural and Scenic Rivers Act of 1988, and National and Local Scenic Byway Programs. This resource is technically significant because of visual accessibility to unique combinations of geological, botanical, and cultural features that may be an asset in a study area. Public significance is based on expressed public perceptions and professional evaluation.

Existing Conditions
The aesthetic resources in the vicinity of the Proposed Action include the architectural character and landscaping of surrounding residential areas. The architectural character and landscaping associated with areas in the vicinity of the facilities varies, with many of the western facilities located near residential areas and many of the eastern facilities near industrial or commercial areas or are located out-of-sight from any development. There are no scenic rivers as defined by the Louisiana Scenic Rivers Act §1847, natural areas, parks, or other areas typically susceptible to aesthetic degradation or which provide high aesthetic value that are visibly accessible to the pump stations. Except for the historically significant DPS, the pump stations themselves lack any aesthetic value and consist of industrial-style buildings and structures, paved or graveled areas, canals, canal banks, and maintained grass areas.

Future Conditions with No Action
With implementation of the No Action Alternative, no changes to the aesthetic setting of the project area would occur. However, the aesthetic resources associated with residential areas would continue to be susceptible to degradation by flooding during extreme tropical storm events.
Future Conditions with the Proposed Action
With implementation of the Proposed Action, aesthetic resources could be temporarily impacted in residential areas within the visual limits of construction activities. The presence of construction equipment and materials could temporarily increase the industrial character within the immediate view of the affected facilities. Additional outdoor buildings and/or generators constructed at some DPS could be in the view shed. However, similar industrial or commercial areas or the levee itself are found within the same view shed. Due to the minimal amount of

time and equipment required for construction, lack of significant aesthetic resources nearby, and existing industrial elements of the existing facilities, impacts to aesthetic resources would be minimal.

Future Conditions with Alternative 1
The impacts from implementation of Alternative 1 would be greater than those described for the Proposed Action because additional structures would be constructed and some facilities would be elevated.

NOISE

This resource is institutionally important because of the Noise Control Act of 1972. Exposure of persons to or generation of noise levels in excess of applicable standards is publicly significant.

Existing Conditions
Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities part of everyday life, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz (HZ) are used to quantify sound frequency. The human ear responds differently to different frequencies. *A-weighing*, described in a-weighted decibels (dBA), approximates this frequency response to express accurately the perception of sound by humans. Sounds encountered in daily life and their approximate levels in dBA are provided in Table 2.

Table 2.
Common Sounds and Their Levels

Outdoor	Sound level (dBA)	Indoor
Snowmobile	100	Subway train
Tractor	90	Garbage disposal
Noisy restaurant	85	Blender
Downtown (large city)	80	Ringing telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Source: Harris 1998

The dBA noise metric describes steady noise levels. Although very few noises are, in fact, constant; therefore, a noise metric, Day-Night Sound Level (DNL) has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 P.M. to 7 A.M.). DNL is a useful descriptor for noise because (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. In addition, Equivalent Sound Level (Leq) is often used to describe the overall noise environment. Leq is the average sound level in dB.

The Noise Control Act of 1972 (PL 92-574) directs Federal agencies to comply with applicable federal, state, interstate, and local noise control regulations. In 1974 the U.S. Environmental Protection Agency (USEPA) provided information suggesting that continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals. Neither Louisiana, nor the Louisiana Department of Environmental Quality, has implemented noise regulations at the state level. However, Orleans Parish has a local noise regulation. The maximum permissible sound levels by land use category are outlined in Table 3. Sounds generated from construction and demolition activities are exempt from the Orleans ordinance between 7:00 A.M. and 6:00 P.M. (11:00 P.M. for areas other than residential) (Chapter 66 Article IV Orleans Municipal Code).

Existing sources of noise near DPS 7, 17, 19, 20, I-10, Monticello, and Pritchard are mainly road traffic, local industry, and high-altitude aircraft overflights. The areas surrounding these locations can be categorized as moderate commercial, industrial, and noisy residential areas. The noise environment consists of routes of relatively heavy or fast automobile traffic but where heavy truck traffic is not extremely dense. Natural noises such as water, leaves rustling, and bird vocalizations are limited at these locations.

Existing sources of noise near DPS 1, 2, 3, 5, 10, 12, 14,16, Grant, the Carrollton Frequency Changers, and the Old River and New River Intake Pump Stations include local road traffic, local commercial operations, boat repair shops, construction activities, and natural noises such as water, leaves rustling, and bird vocalizations. The areas surrounding these locations can be categorized as quiet commercial, industrial, and normal urban residential areas. The noise environment consists of light traffic conditions where no mass transportation vehicles and relatively few automobiles and trucks pass. Shipping and boating activity at two large marinas and a U.S. Coast Guard station is an additional source of commercial noise near the Lake Pontchartrain facilities (DPS 10, 12, 14, 16).

Table 3.
Maximum Permissible Sound Levels by Receiving Land Use Category in Orleans Parish

Receiving Land Use Category	Time	Sound Level Limit (dBA)	
		L10[1]	Lmax
Resident	7:00 A.M. - 10:00 P.M.	60	70
	10:00 P.M. - 7:00 A.M.	55	60
Commercial	7:00 A.M. - 10:00 P.M.	65	75
	10:00 P.M. - 7:00 A.M.	60	65
Industrial	At all times	75	85

Sources: Chap 66 Article IV Orleans Municipal Code
1 L_{10} = sound pressure level that is exceeded ten percent of the time

DPS 4, 6, 13, and 15 are more traditional residential areas. Existing sources of noise are local road traffic, high-altitude aircraft overflights, and natural noises such as leaves rustling and bird vocalizations. These areas are similar to those outlined above, but the background sound either is distant traffic or is difficult to identify by residents.

DPS 11 and 18 are slightly more remote. Existing sources of noise are high-altitude aircraft overflights and natural noises such as leaves rustling and bird vocalizations. The areas

surrounding these locations can be categorized as quiet. They are isolated from significant sources of sound and are situated in shielded areas.

Existing noise levels, Leq and DNL, were estimated at the facilities and surrounding areas using the techniques specified in the *American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound Part 3: Short-term measurements with an observer present*. Table 4 outlines the closest Noise Sensitive Areas (NSAs) such as residents, schools, churches, and hospitals and the estimated existing noise levels at each location.

Future Conditions with No Action

The No Action Alternative would have no impacts to noise receivers because no construction would occur, and no additional equipment would be installed. Noise levels would remain at their existing levels.

Table 4.
Noise Sensitive Areas and Estimated Existing Noise Levels at Proposed Sites

	Closest Noise Sensitive Area (NSA)				Estimated Existing Sound Levels (dBA)		
Site	Distance (feet)	Direction	Type	Land Use Category	DNL	Leq Daytime	Leq Nighttime
DPS 7	325	SW	Residential	Moderate Commercial, Industrial, and Noisy Urban Residential	65	64	57
DPS 17	425	S	Residential				
DPS 19	2250	SE	Residential				
DPS 20	3000	N	Residential				
DPS I-10	50	W	Residential				
DPS Monticello	50	SE	Residential				
DPS Pritchard	8	NE	Residential				
DPS 1	200	SE	Church	Quiet Commercial, Industrial, and Normal Urban Residential	60	58	52
DPS 2	300	SE	Residential				
DPS 3	60	W	Residential				
DPS 5	450	SE	Residential				
DPS 10	100	E	Multi-Family Residential				
DPS 12	235	W	Residential				
DPS 14	60	SW	Residential				
DPS 16	50	NW	Residential				
Carrollton Frequency Changers	30	NW	Commercial				
Grant DPS	5500	N	Residential				
Old River Intake Pump Station	180	W	Residential				
New River Intake Pump Station	280	E	Residential				
Carrollton Power Complex	130	SE	Residential				
DPS 4	10	S	Residential	Quiet Urban Residential	55	53	47
DPS 6	75	W	Multi-Family Residential				
DPS 13	185	N	Residential				
DPS 15	13000	NW	Multi-Family Residential				
DPS 11	1350	N	Residential	Quiet Suburban (Semi-Urban) Residential	50	48	42
DPS 18	700	W	Residential				

Source: American National Standards Institute 2003

Future Conditions with the Proposed Action

Short-term minor and long-term moderate adverse effects to the noise environment would be expected with the implementation of the Proposed Action. The effects would be primarily due to heavy equipment noise during construction and the temporary operation of proposed stormproofing equipment, such as back-up generators and pumps, during storm events. Emergency power generators may be located inside the pump stations or outside directly adjacent to the pump stations depending upon space and building heat load considerations. These generators will occasionally be started and may increase the noise level near the station. This evaluation considers significant sound sources that could affect NSAs. All significant sources of noise, their contribution to the overall noise environment, and maximum sound level were estimated for comparison to local noise control standards.

Construction Noise. All the sites would have some form of light construction activities associated with the application of architectural coatings, door replacement, shutter upgrades, etc. Noise associated with light construction activities would be negligible. Most light construction activities would occur during normal daytime working hours.

All the sites would have some form of moderate or heavy construction. This would take the form of heavy equipment for clearing and grading, new building construction, concrete pouring, and the drilling of water wells. The specific impact of construction activities would vary depending on the type, number, and loudness of equipment in use. Individual pieces of construction equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet. Table 5 presents typical noise levels (dBA at 50 feet) that the USEPA has estimated for the main phases of outdoor construction. With multiple items of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within several hundred feet of active construction sites.

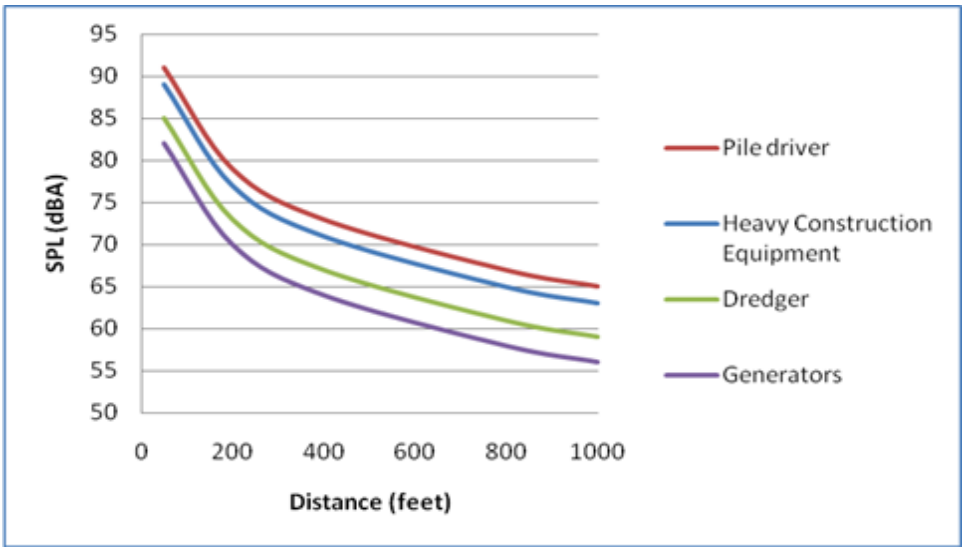
Table 5.
Noise Levels Associated with Outdoor Construction

Construction Phase	Leq (dBA) at 50 feet from Source
Ground Clearing	84
Excavation, Grading	89
Foundations	78
Structural	85
Finishing	89

Source: USEPA 1971

Figure 3 presents maximum noise levels vs. distance for construction-related activities. The zone of relatively high construction noise levels typically extends to distances of 400 to 800 feet from the site of major equipment operations. Many of the locations have residences within 1,000 feet which would experience substantial levels (greater than 62 dBA) of construction noise (Table 4). Noise associated with construction activities would be temporary in nature, and would end after the construction phase of the proposed action. Therefore, these effects would be minor and temporary. In addition, sounds generated from heavy construction activities are expected to exceed the levels in the Orleans noise ordinance for construction activities afterhours (70 dBA). Special variances to the local noise ordinance or mitigation measures may be required at some locations. Construction activities are exempt from the Orleans ordinance between 7:00 A.M. and 6:00 P.M. (11:00 P.M. for areas other than residential).

Figure 3.
Maximum Sound Pressure Level vs. Distance for Construction Related Activities



Source: Federal Highway Administration 2006

These effects would be temporary, and would be considered minor. The following best management practices (BMPs) would be used to reduce these already limited effects:

- Construction would predominately occur during normal weekday business hours in areas adjacent to noise-sensitive land uses such as residential areas; and
- Construction equipment mufflers would be properly maintained and in good working order.

Construction noise would be expected to dominate the soundscape for all on-site personnel. Construction personnel, and particularly equipment operators, would wear adequate personal hearing protection to limit exposure and ensure compliance with Federal health and safety regulations.

Operational Noise. DPS 5, 6, 7, 10, 13, 17, and the Carrollton Power Plant would have additional back-up generators ranging in size from three to 15 MW installed. These generators would generate increased noise during storm events. Noise levels that would be generated by operation of the pump stations after the upgrades were estimated for non-storm conditions, 50 percent capacity, and 100 percent capacity (Table 6). Sound level data for the proposed equipment were obtained from vendors, calculated using empirical formulas based on process and mechanical equipment data, or from similar projects, and are outlined in Appendix C. It was assumed that under non-storm conditions the stations would operate using power supplied 100 percent by the power grid in the area; under 50 percent operating conditions power would be supplied from the diesel generators running at 50 percent load; and that under 100 percent capacity, 100 percent of the power would be supplied by diesel generators. It was also assumed that the pumps at each DPS are sized to be fully operated with the new back-up generators.

Table 6.
Predicted Noise Levels at Nearest Noise Sensitive Area

Location	Estimated Sound Levels At Nearby Noise Sensitive Area (dBA)					
	DNL			Leq		
	Nonstorm	50% Capacity	100% Capacity	Nonstorm	50% Capacity	100% Capacity
DPS 5	65	73	75	64	68	70
DPS 6	65	72	74	64	67	69
DPS 7	60	86	89	58	80	83
DPS 10	55	85	88	53	79	81
DPS 13	60	70	72	58	64	66
DPS 17	55	86	89	53	80	82
Carrollton Power Complex	60	82	85	58	76	79

Note: Shaded areas indicate levels loud enough to adversely affect quality of life temporarily at the nearest receptor.

The pumping stations upgrades are in the preliminary design stages. Therefore, a complete equipment list and associated manufacturers specifications is not finalized. However, the major noise-producing equipment associated with the pump stations would include, but not be limited to pumps, electric motors, and emergency generators. Much of the noise-producing equipment would be contained inside pump superstructures that would be fabricated with noise reducing material. However, the emergency generators' intakes and exhausts would be open to the exterior of the facilities. Equipment ultimately selected may differ in specific features from the ones described in this EA, but the noise profiles would be comparable with those described herein. Moderate changes in the size or type of equipment ultimately selected would not change the level of impact under NEPA.

Under normal nonstorm conditions, there would be no outdoor sources of noise (i.e. generator exhausts) and levels would be easily controlled by the pump station walls. Noise levels from the pump stations under normal nonstorm conditions are expected to be below the levels outlined in the Orleans noise ordinances and comparable to existing conditions.

Construction Noise. All the sites would have some form of light construction activities associated with the application of architectural coatings, door replacement, shutter upgrades, etc. Noise associated with light construction activities would be negligible. Most light construction activities would occur during normal daytime working hours. Contractors would be instructed to conduct proper and routine maintenance of all vehicles and other equipment. These actions ensure that mufflers minimize noise within the design standards of all construction equipment.

Future Conditions with Alternative 1
Short-term minor and long-term moderate adverse effects to the noise environment would be expected with the implementation of Alternative 1. Effects would be greater than those outlined under the Proposed Action because additional construction would occur. Adverse effects to the noise environment would be primarily due to heavy equipment noise during construction and the operation of proposed stormproofing equipment such as back-up generators and pumps during storm events.

Construction Noise. Noise levels and their effects during the construction of the pump stations under Alternative 1 would be greater than those outlined under the Proposed Action. Some additional construction activities would be expected under Alternative 1. Noise associated with construction activities would be temporary in nature, and would end after the construction phase. Therefore, as with the Proposed Action, these effects would be minor.

Operational Noise. Noise levels and their effects during the operation of the pump stations under Alternative 1 would be greater than those outlined under the Proposed Action. The number of, sizes, and types of equipment installed would be the same as that identified under the Proposed Action because additional equipment would be installed and operated.

AIR QUALITY

This resource is considered institutionally important because of the Louisiana Environmental Quality Act of 1983, as amended, and the Clean Air Act of 1963, as amended. Air quality is technically important because of the status of regional ambient air quality in relation to the National Ambient Air Quality Standards (NAAQS). It is publicly important because of the desire for clean air expressed by virtually all citizens.

Existing Conditions
There are seven criteria air pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO2), ozone (O3), sulfur dioxide (SO_2), and two forms of particulate matter (PM10 – particulate matter with a diameter of 10 micrometers or less and PM2.5 - particulate matter with a diameter of 2.5 micrometers or less). The Federal Clean Air Act (CAA) requires that all regions reduce monitored level of these pollutants below the NAAQS.

When ambient air pollution parameters exceed NAAQS, these airsheds are designated by EPA as “non-attainment”, and the state is responsible for preparing a State Implementation Plan (SIP) that designs a plan to “attain” ambient NAAQS. If a Federal action occurs in a one of these managed areas, they are subject to the general conformity rules, and must conform to the SIP and not prevent the state from achieving the NAAQS.

Orleans Parish is currently in attainment of all NAAQS. Therefore, the general conformity rules do not apply. A number of parishes northwest of Orleans Parish are designated as “non-attainment” areas for the 8-hour ozone standard. These include East Baton Rouge, Ascension, Iberville, and West Baton Rouge parishes. Air emissions from internal combustion engines produce volatile organic compounds (VOCs) and nitrogen oxides (NOx) which are precursor molecules that react with oxygen in the atmosphere to create ozone. If metropolitan New Orleans experiences a southeast wind, which is common during summer months, air pollution from Orleans Parish could migrate into the designated nonattainment parishes mentioned above.

Future Conditions with No Action
The No Action alternative would not require any construction and therefore would not result in any impacts to air pollution.

Future Conditions with the Proposed Action
Temporary increases in air pollution would occur from the use of construction equipment, generators, compressors, pumps, and construction vehicle traffic. Combustible emissions from construction equipment would be expected to temporarily increase during the construction phase of the project. Particulate emissions (fugitive dust) would be generated by activities that

disturb and suspend soils, such as vehicle trips on unpaved roads, bulldozing, compacting, truck dumping, and grading operations. Operation of construction equipment, pump station generators, and support vehicles would also generate VOCs; PM-10, NOx, CO, ozone and SOx emissions would be generated from diesel engine combustion.

Due to the short duration and limited activities of the construction project, any increases or impacts on ambient air quality would be expected to be short-term and minor. No significant impacts to air quality would be expected to occur as a result of implementing the Proposed Action.

Standard construction BMPs, such as routine watering of access roads, would be used as a primary means of fugitive dust control during the construction phases of the Proposed Action.

Future Conditions with Alternative 1
The impacts from implementation of Alternative 1 would be greater than those described for the Proposed Action because additional construction would occur and additional equipment would be operated.

SOCIAL AND ECONOMIC RESOURCES

Compliance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, is institutionally important. Evaluating all actions to determine if they disproportionately affect low income or minority populations is technically important. The displacement of substantial numbers of existing housing or people is publicly important.

Existing Conditions

Population and Demographics
According to the 2000 U.S. Census, the population of Orleans Parish in 2000 was 484,674 and in 2006, it had dropped to 223,388 after Hurricane Katrina. The 2006 American Community Survey lists the percentage of race of Orleans Parish as White (36.7 percent), followed by African-American (58.8 percent) and Asian (2.8 percent), with the remaining 1.6 percent of the population divided between American Indians and Alaskan Natives, Native Hawaiians and other Pacific Islanders, and other races (Table 7).

Table 7.
Demographics of Orleans Parish

Year	Total Population	White (%)	African-American (%)	American Indian and Alaska Native (%)	Asian (%)	Native Hawaiian and Other Pacific Islander (%)	Hispanic* (%)	Some other race (%)	Two or more races (%)
2000	484,674	28.1	67.3	0.2	2.3	0.02	2.9	0.9	1.3
2005	437,186	28.1	67.5	0.2	2.4	0.0	3.1	0.7	0.9
2006	223,388	36.7	58.8	0.1	2.8	0.04	4.0	0.7	0.5
2007 **	301,016	31.6	63.5	0.2	2.7	0.0	4.0	1.1	1.0

Source: U.S. Census 2008; *Hispanics may be of any race. **Estimates.

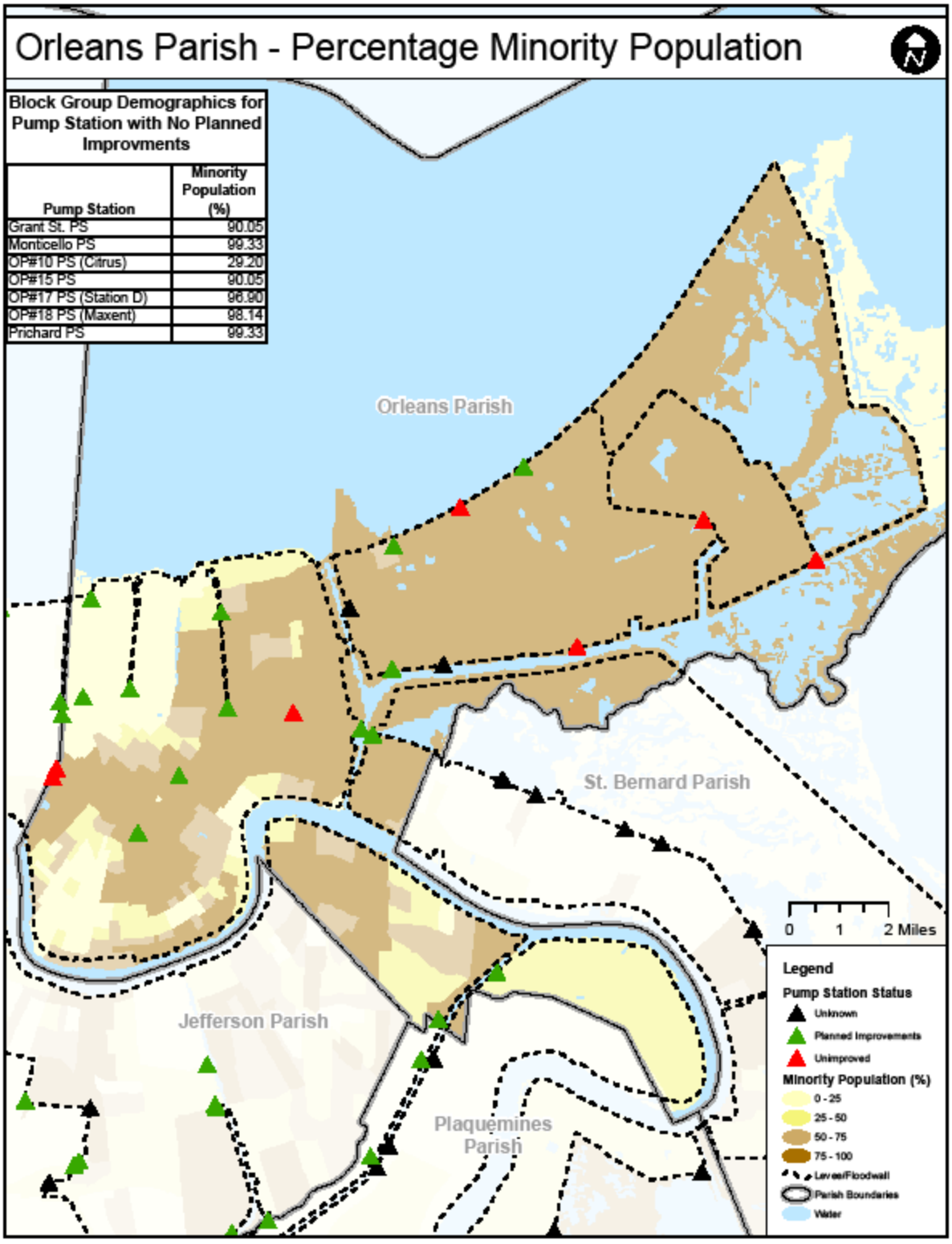


Figure 4. Orleans Parish Polders and Demographics

Economic

In 2000, Orleans Parish had a median household income of $27,133 and a median family income of $32,338. The percent of individuals below poverty level was 23.7 percent. After Hurricane Katrina, the median household income was $35,859 and the median family income was $47,754. The percent of individuals below poverty level in 2007 was 22.6 percent. The Health and Human Services state that the 2008 poverty threshold for a family of four is $21,200. See Table 8 for more economic information for Orleans Parish.

Table 8.
Economic Information for Orleans Parish

Year	Total Population.	Median Family Income	Median Household Income	Individuals Below Poverty Level (%)	Pop. Over 16 Yrs.	In Labor Force	Individuals in Workforce (%)
2000	484,674	$32,338	$27,133	23.7	370,138	213,819	57.8
2005	437,186	$39,428	$30,711	21.8	336,748	214,525	63.7
2006	223,388	$47,754	$35,859	16.0	179,325	105,853	59.0
2007**	301,016	$43,661	$35,409	22.6	-	-	-

Source: U.S. Census 2008. **Estimates.

Housing

According to the 2000 U.S. Census Bureau, Orleans Parish had a total of 188,251 occupied housing units (Table 9). The Federal Emergency Management Agency and the Small Business Administration estimate that of these units, 29,241 suffered minor damage, 26,405 suffered major damage, and 78,918 suffered severe damage from Hurricanes Wilma, Katrina, and Rita (U.S. Department of Housing and Urban Development 2006a and 2006b). The SBA estimates that the median verified loss for major damage was $80,884 and for severe damage was $107,815 for these three hurricanes.

Table 9.
Housing Information for Orleans Parish

Year	Total Housing Units	Occupied Units	Vacant Units
2000	215,091	188,251	26,840
2005	213,137	163,334	49,803
Post Hurricane Katrina			
2006	105,661	73,516	32,145

Source: U.S. Census 2008

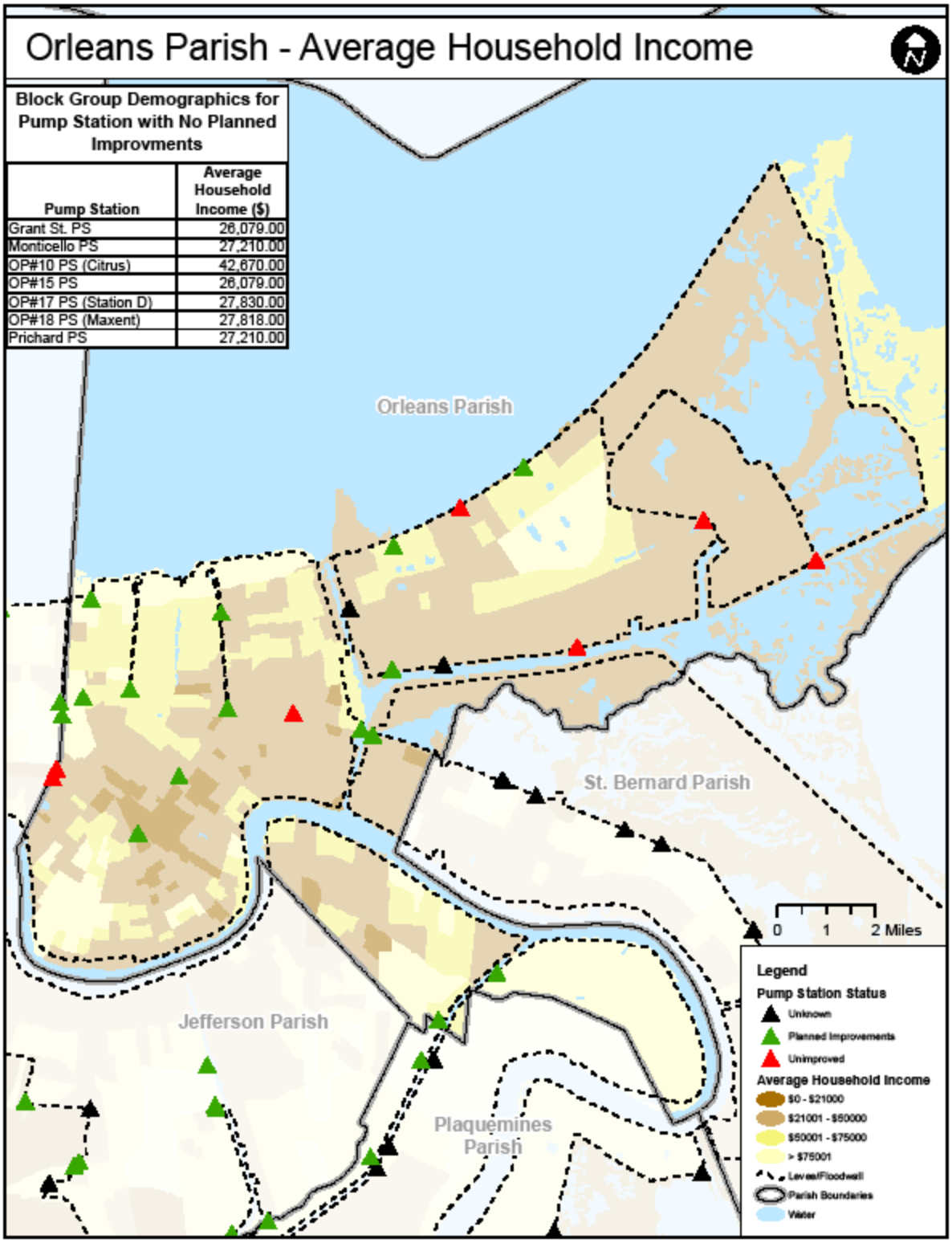


Figure 5. Orleans Parish Polders and Income.

Environmental Justice

This resource is important because of Executive Order 12898 of 1994 and the Department of Defense's Strategy on Environmental Justice of 1995, which direct Federal agencies to identify and address any disproportionately high adverse human health or environmental effects of Federal actions to minority and/or low-income populations. The Environmental Protection Agency (EPA) defines Environmental Justice as the fair and equitable treatment (fair treatment and meaningful involvement) of all people with respect to environmental and human health consequences of federal laws, regulations, policies, and actions.

In 2007 the Census Bureau estimated that 18.6% of families in Orleans Parish lived at or below the poverty level. That year, the poverty threshold was $10,590 for an individual and $21,203 for a family of four. Demographic estimates for Orleans Parish totaled 31.6% White and 68.4% Minority.

The demographics of the project area were evaluated in detail using Census block group statistics from 2000 and the 2005 - 2007 American Community Survey estimates. The proposed action does not disproportionately occur in low-income or minority neighborhoods, however the locations of the facilities that receive storm proofing later in the construction sequence fall predominantly within minority or low-income communities when compared to the greater average.

According to the November 2005 CRS Report for Congress, *Hurricane Katrina: Social-Demographic Characteristics of Impacted Areas*, Hurricane Katrina disproportionately impacted poor and minorities, mostly African-Americans (Gabe *et al*. 2005). A total of 272,000 African-Americans were displaced by flooding or damage, accounting for 73 percent of the population affected by the storm (Gabe *et. al*. 2005). Sixty-seven percent of the total population of Orleans Parish prior to Hurricane Katrina was comprised of African-Americans (U.S. Census Bureau 2008). Because of the USACE's commitment to fair and equitable treatment this current proposed action has been evaluated for consistency with Executive Order 12898.

The pumps within Orleans affect a greater basin area than the immediate community block group in which they are located. The impacts that would occur due to pump station failure due to inadequate storm proofing are compared at a basin or polder level for this analysis. Information on the names and locations of these stations are detailed in table 10.

Future Conditions with No Action

Under the No Action alternative, no stormproofing would take place. As a result, several pump stations would need to be abandoned during a severe tropical storm event and would not be able to operate through the entire storm event. Therefore, there is the potential for flooding in Orleans Parish and associated costs in damage to housing units and other public and commercial structures.

Future Conditions with the Proposed Action

With the implementation of the proposed action, short-term beneficial economic impacts would occur during construction activities from the associated construction costs and purchase of materials. The improvements at each DPS and the power complex would allow the facilities to operate throughout a storm event and would reduce the possibility of large-scale flooding in Orleans Parish. As a result, a reduction in the costs resulting from flooding damage would be expected from the implementation of the proposed action.

The additional hurricane, storm, and flood damage risk reduction resulting from implementation of the proposed action would benefit the entire parish.

The stormproofing work for installations in the New Orleans East and Orleans East Bank polders (figure 4) which is scheduled later in the Construction Sequencing Plan may not occur due to funding constraints. The pump stations that are scheduled for stormproofing later in the Construction Sequencing Plan and fall within low-income and/or minority communities are the Carrollton Frequency Changer, DPS 10, DPS 15, DPS 17, DPS 18, Grant, Monticello, and Pritchard. The rationale for sequencing these projects later in the plan was based on system pumping capacity, risk, current conditions, and elevation, among other criteria. If this stormproofing is not conducted at these stations it would not disproportionately affect any communities within the respective polders because the stations handle only five percent of the pumping capacity in Orleans Parish, and would be able to either run automatically during a storm event, or the flow could be diverted to adjacent pump stations. In contrast, failure to stormproof the major stations in these basins (DPS 1, 2, 3, 6 and 7) could increase the risk of flooding for all neighborhoods in their drainage basins, including the neighborhoods surrounding the eight facilities listed above.

The impacts of sequencing the stormproofing of these facilities are not disproportionately high in nature and are borne by other community groups affected by a particular pump capacity in a given area. Based on this analysis the proposed action would not disproportionately negatively impact minority or low-income populations in Orleans Parish.

Table 10. Environmental Justice Stormproofing Data

Zip Code	Minority Community (25%+)	Low-Income Community (to $21K)	Polder	PS Name	Improved?	Basin	Design Capacity (cfs)
70127	x		New Orleans East	OP 10	Conditional	Eastern NO	1000
70128	x		New Orleans East	OP 14	Yes	Eastern NO	1200
70126	x		New Orleans East	OP 16	Yes	Eastern NO	1000
70126	x		New Orleans East	OP 20	Yes	Lower Eastern NO	500
70129	x		New Orleans East	Grant	Conditional	Lower Eastern NO	172
70129	x		New Orleans East	OP 15	Conditional	Maxent	750
70129	x		New Orleans East	OP 18	Conditional	Maxent	150
70122	x		Orleans East Bank	OP 17*	Conditional	Bywater	300
70126	x		Orleans East Bank	OP 19	Yes	Bywater	3650
70119	x		Orleans East Bank	OP 3*	Yes	Bywater	4260
7-----	x		Orleans East Bank	Carrollton Frequency Changer	Conditional	Carrollton	n/a
70124			Orleans East Bank	I-10 UP	Yes	Carrollton	860
70118	x		Orleans East Bank	Monticello	Conditional	Carrollton	99
70118	x		Orleans East Bank	Pritchard	Conditional	Carrollton	253
70005			Other	OP 6	Yes	Carrollton	9480
70124			Orleans East Bank	OP 12	Yes	Lakeview/Gentilly	1000
70122	x		Orleans East Bank	OP 4	Yes	Lakeview/Gentilly	3720
70124			Orleans East Bank	OP 7*	Yes	Mid-City	2690
70125	x	x	Orleans East Bank	OP 1*	Yes	Uptown	6825
70119	x		Orleans East Bank	OP 2*	Yes	Uptown	3190
70126	x	x	Other	OP 5*	Yes	Lower 9th Ward	1260
70131	x		Other	OP 11	Yes	Lower Algiers	1670
70131	x		Other	NOSWB 13	Yes	Upper Algiers	4650

*NRHP Eligible

Future Conditions with Alternative 1

The beneficial impacts from implementation of Alternative 1 would be greater than those described for the Proposed Action because additional construction would occur. The adverse impacts would be similar to those described for the proposed action.

TRANSPORTATION

Existing Conditions

Access to the facilities for construction is provided by Interstate 10 (I-10) on the east bank and the West Bank Expressway (US 90) on the west bank (see Figure 1). Both I-10 and US 90 are limited access, divided highways. Secondary roads, such as State Highway 23 (Belle Chasse Highway), State Highway 47 (Hayne Boulevard), and local 2-lane street networks provide access to the pump facilities. Generally, the level of service for 1-10 and US 90, as well as

secondary multi-lane roads, includes large volumes of traffic with a high density of vehicles during peak commute hours.

Future Conditions with No Action
The No Action alternative would not require any construction and therefore would result in no change in traffic flow or patterns.
Future Conditions with the Proposed Action
Construction equipment and movement of construction materials would be required during the construction period. The small number of vehicle trips to each of the facilities would not significantly impact traffic flow or patterns on arterial or secondary roads but would have minor, short-term impacts on nearby two-lane roads and residential streets located immediately adjacent to the facilities. Once construction is complete, no additional vehicle trips are anticipated; therefore, there would be no long-term impacts to traffic flow or patterns as a result of the Proposed Action. The ductbank would be installed during the Earhart Boulevard road reconstruction project which is scheduled to start in 2009 or 2010 and take approximately 18 months to complete; therefore, the installation of the ductbank is not anticipated to impact local transportation patterns.

Future Conditions with Alternative 1
With the implementation of Alternative 1, the impacts to local and regional transportation patterns at the facilities would be similar to those short-term impacts on traffic flow and patterns described for the Proposed Action.

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

CEMVN is obligated under Engineer Regulation 1165-2-132 to assume responsibility for the reasonable identification and evaluation of all Hazardous, Toxic, and Radioactive Waste (HTRW) contamination within the vicinity of the proposed action. Earth Tech, Inc. (Earth Tech), under contract to CEMVN, completed a HTRW Phase I Environmental Site Assessment (ESA) for Pump Stations Stormproofing Activities, Orleans Parish, Louisiana, dated July 2008. The Phase I ESA report includes 22 pump stations, two river intakes, one water treatment plant, and one frequency changer station, for a total of 26 locations. All but two of the sites are located on the left descending bank (East Bank) of the Mississippi River in New Orleans, with the remaining two sites located on the right descending bank (West Bank) of the Mississippi River in Algiers.

The Phase I ESA found three Recognized Environmental Conditions (Table 10). Two RECs associated with the storage of diesel fuel were found at the Carrollton Water Treatment Plant. These consisted of oil stains on the floor. This condition can be easily remediated (cleaned up), and should be removed. The third REC was found at DPS 14 and also resulted from deficiencies in fuel storage practice. This condition also can and should be corrected. None of these three possible RECs would affect the proposed stormproofing work if these small oil stains were cleaned and removed.

Table 11.
Recognized Environmental Conditions.

Site	Location	REC Site Description
OP-14	First floor area located under second floor diesel engine; Lat: 30° 03' 13.14082" N, Long: 89° 57' 59.37575" W	Drain line from diesel engine on second floor drains to storage room below on first floor with no capture. Diesel fluid drains directly to concrete, flows to an open pit that appears to drain to the canal.
Carrollton Water Treatment Plant	Equipment storage area in the southeast corner; Lat: 29° 57' 23.47957" N, Long: 90° 07' 40.63540" W	Diesel and/or oil stains on soils. An active diesel fuel above ground storage tank (AST) is also located in the area. Staining is likely due to equipment leaks and fueling operations.
Carrollton Water Treatment Plant	North of Power House Building; Lat: 29° 57' 29.4170" N, Long: 90° 07' 42.67208" W	Six transformers located north of the Power House Building had visible stains on the casing that might be due to transfer spills.

Each drainage pump station was observed to have stored 55-gallon drums, 5-gallon containers, 1-gallon containers, and spray cans that contained petroleum products that consisted of different grades of oil, kerosene, mineral spirits, waste oil, antifreeze, transmission fluid, grease, cleaning chemicals, paint, and granular dry absorbent material. The 55-gallon drums contained different grades of oil used to maintain the pumps as well as antifreeze, transmission fluid, mineral spirits, kerosene, and cleaning agents. The 55-gallon drums and 5- gallon containers are also used to store the previously mentioned products as waste. The 5-gallon buckets contained oil for the pumps, used oil from the pumps, grease used to lubricate and seal the pumps, and cleaning agents. The gallon containers were used to store paint and liquid cleaning materials. The containers were observed to be stored inside as well as outside the buildings. Many sites had fluid-filled transformers of different sizes owned by the New Orleans Sewage & Water Board (S&WB) and transformers owned by Entergy (the local electrical company).

The above-mentioned containers stored *inside the facilities*, in general were protected from the outside elements. Petroleum product stains or standing liquids observed inside the pump station facilities were observed on or around the equipment and floors due to pump leaks, ongoing or past work on the equipment, and/or transfer spills. The transfer spills ranged in size from small stains to medium stains, to standing fluids on the equipment. Some metal containers appeared to be rusting near the bottom where the container came in contact with the concrete floor, and petroleum stains or liquids were observed. In general, the petroleum product buildup observed on top of storage containers and surrounding areas were due to housekeeping and maintenance issues.

The above-mentioned containers stored *outside the facilities*, in general, were not protected from the elements. Some of the containers were severely rusted or physically damaged, improperly stored and not covered, and open. Petroleum product stains or liquids observed on the ground outside and underneath pumping stations appeared to be due to rusting containers, overflows from cans or drums not sealed to keep the rain out, transfer spills, and, in some instances, due to a lack of proper waste petroleum capture from the diesel engines located above. According to site contacts, there is a regular schedule to pick up containers not needed on site, and the containers are supposed to be stored temporarily. However, it appeared that many containers have been on site exposed to the elements for some time, with varying degrees of damage to the containers. Again, the petroleum product buildup observed on top of storage containers and surrounding areas were due to housekeeping and maintenance issues.

Although no Recognized Environmental Conditions were found at most of the pumping station sites, a few sites had low levels of contamination resulting mainly from used oil spilling on the ground near drums used to store the oil until it is collected for professional disposal. The contractor's report notes that these spills, although not a direct threat to the proposed improvements, would be easily remediated (i.e., contaminated soil removed). The clean-up of these small spills should precede the start of construction on these projects. Aside from the problems with fluid storage, and three RECs noted above, no other environmental conditions were identified in the Phase I ESA report. The probability of encountering HTRW during the proposed project is small. Unless the location or construction methods change, no further HTRW investigation is needed.

CUMULATIVE IMPACTS

The CEQ Regulations define cumulative impacts 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."

The Metropolitan New Orleans Hurricane Protection System is divided into three USACE authorized projects: 1) Lake Pontchartrain and Vicinity; 2) West Bank and Vicinity; and 3) New Orleans to Venice. The New Orleans to Venice project is not discussed because its alignment is not located within the project area. The Lake Pontchartrain and Vicinity Project was authorized by Section 204 of the Flood Control Act of 1965 (PL 89-298 as amended) and currently provides for enlargement of hurricane protection levees along Lake Pontchartrain in Orleans, Jefferson, and St. Charles Parishes and in portions of Orleans and St. Bernard Parishes between the Mississippi River and the Mississippi River Gulf Outlet. The West Bank and Vicinity Project was originally authorized by the Water Resources Development Act (WRDA) of 1986 (PL 99-662) and named the Westwego to Harvey Canal Hurricane Protection Project. The WRDA of 1996 modified the project and added the Lake Cataouatche area to the project. WRDA 1996 also authorized the East of Harvey Canal Hurricane Protection Project. WRDA 1999 combined the three projects into a single project under the current name. The project includes levees, floodwalls, and a flood gate, and is located on the west bank of the Mississippi River in the vicinity of New Orleans and in Orleans, Jefferson and Plaquemines Parishes.

Prior to Hurricane Katrina, Orleans Parish maintained and operated the forced drainage network. This included maintenance and upgrades of the existing pump stations, canal maintenance, such as mowing of vegetation along the banks, and clearing of debris, and periodic dredging of canals to insure adequate capacity.

In 1997, the MVN entered into a Project Cooperative Agreement with Orleans Parish to improve drainage. Authority for this endeavor is the Southeast Louisiana Urban Flood Control (SELA) Project. Under the SELA project, drainage improvements consist of channel improvement projects, adding capacity to existing pump stations, and constructing new pump stations.

Under SELA, plans were approved to improve twelve major drainage lines, adding pumping capacity to two pump stations, and adding a new pump station. Proposed plans include improving five major drainage lines, adding pump capacity to two existing pump stations, and adding two new pump stations. By October 30, 2007, nine contracts had been awarded, with

eight having been completed. The proposed projects are scheduled to be complete by 2016. The S&WB is cost-sharing the work in Orleans Parish.

The Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project, St. Bernard, Orleans, Jefferson, and St. Charles Parishes consists of enlarging the levees along the Orleans Parish lakefront, parallel protection (levees, floodwalls, and flood proofed bridges) along three outfall canals (17th Street, Orleans Avenue, and London Avenue), and levees from the New Orleans lakefront to the Intracoastal Waterway. Authority for this endeavor is the Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project which was authorized by the Flood Control Act of 1965 and the Water Resources Development Acts of 1974, 1986, 1990, and 1992. This work should be on-going until 2011.

In 2007, an EA was finalized for Stormproofing Activities at the Jefferson Parish Pump Stations (EA #454). This project consisted of constructing safe rooms at Lake Cataouatche, Westwego #2, Estelle #2, Hero, and Planters pump stations; automating pumps between the pump station and the existing safe rooms at Ames, Duncan, Elmwood, Suburban, and Bonnabel pump stations; and automating pumps from remote safe rooms at Westminster and Parish Line pump stations. The purpose of this project is to provide flood, hurricane, and storm damage reduction by helping to ensure pump station operation for the east and west banks of urbanized areas of Jefferson Parish and to provide safe refuge for Jefferson Parish employees.

Since Hurricane Katrina, there has been a substantial amount of proposed infrastructure repair and upgrade in the vicinity of the 22 DPS, the Carrollton Frequency Changer Building, the Old River Intake Pump Station, the New River Intake Pump Station, and the Carrollton Water Plant and Power Complex in Orleans Parish. Work is ongoing throughout the New Orleans Hurricane Protection System to achieve authorized levels of protection. Within metropolitan New Orleans, the lakefront levee is proposed to be raised to provide 100-year hurricane, storm, and flood damage reduction; the existing I-walls and gates are to be modified or replaced to a 100-year elevation; and road ramps are to be raised. On the East Bank, the Lakefront Airport Floodwall and levees are proposed to be raised to a 100-year elevation; the Citrus Lakefront Levee is proposed to be replaced with T-walls; the levee from Parish Road to South Point is proposed to be raised to a 100-year elevation; the New Orleans East Levee is proposed to be raised to a 100-year elevation from South Point to the Intracoastal Waterway and west to Michoud Canal East; a portion of I-10 is proposed for elevation and a floodwall would be constructed beneath the elevated section; and the US 11 and US 90 floodgates would be modified to a 100-year elevation. In Algiers, the levee from the Algiers Lock to the Belle Chase Highway would be raised to a 100-year elevation. Improvements are ongoing and/or proposed parish-wide to the DPS, including roof repairs; motor rewinds; replacement of horizontal pump bearings; various electrical, mechanical, building, and structural repairs; cleaning of the suction basin and replacement of the discharge line at DPS 17; complete replacement of the Elaine DPS; fronting protection at DPS 13 and modifications to the existing facilities bringing them to the 100-year level of protection.

Rebuilding efforts are taking place throughout southeast Louisiana, and along the Mississippi and Alabama Gulf Coast. The Insurance Information Institute has estimated that the total insured losses from Hurricane Katrina was $40.6 billion in six states, and in Louisiana the insured losses are estimated at $25.3 billion (Insurance Information Institute 2007); much of those insured losses will be a component of the regional rebuilding effort. It is estimated that approximately 228,000 homes were damaged or destroyed, of which about 40 percent were owner-occupied homes and approximately 60 percent were rental units. Although it is unknown

how many structures will be rebuilt in Orleans Parish and throughout the Gulf Coast over the next 5 to 10 years, a large-scale rebuilding effort is underway.

The implementation of the Proposed Action would have no cumulative adverse impacts because all of the construction activities at the facilities would occur in previously disturbed and developed areas, along existing canal banks. No change in normal pump station operations or canal and pump station maintenance would occur. However, the Proposed Action would have cumulative beneficial impacts on the social, economic, housing and infrastructure resources of Orleans Parish as the stormproofed facilities, generators, pumps, and all other DPS equipment would ensure that the drainage pump system is operational during and immediately following severe tropical storm events. Improved hurricane, storm, and flood damage reduction benefits all residents, regardless of income, race or age, and allows for development and redevelopment of existing urban areas.

COORDINATION

Preparation of this draft EA has been coordinated with appropriate Congressional, Federal, state, and local interests, as well as environmental groups and other interested parties. The following agencies, as well as other interested parties, are receiving copies of this draft EA:

U.S. Department of the Interior, Fish and Wildlife Service
U.S. Environmental Protection Agency, Region VI
U.S. Department of Commerce, National Marine Fisheries Service
U.S. Natural Resources Conservation Service, State Conservationist
Advisory Council on Historic Preservation
Governor's Executive Assistant for Coastal Activities
Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources, Coastal Management Division
Louisiana Department of Natural Resources, Coastal Restoration Division
Louisiana Department of Environmental Quality
Louisiana State Historic Preservation Officer

The Proposed Action was coordinated with and reviewed by the USFWS via a letter dated May 9, 2008. As a result of this review, MVN and USFWS jointly concluded that the Proposed Action is not likely to adversely affect any threatened or endangered species or their critical habitat (USFWS fax dated May 13, 2008). A Section 106 concurrence request from the State Historic Preservation Officer (SHPO) was initiated by letter on December 3, 2008. Section 106 concurrence from SHPO was received on January 5, 2009. In a letter dated January 5, 2009 the Louisiana Department of Natural Resources concurred with the determination that the proposed action is consistent, to the maximum extent practicable, with the Louisiana Coastal Resources Program. A Water Quality Certificate was not required. A Section 404(b)(1) Public Notice and a Section 404(b)(1) Evaluation were not required because no work would impact wetlands or waters of the United States. MVN concurred with, or resolved, all Fish and Wildlife Coordination Act recommendations contained in a letter from the U.S. Fish and Wildlife Service, dated December 8, 2008.

MITIGATION

To minimize potential impacts to air quality, contractors would be instructed to conduct proper and routine maintenance of all vehicles and other equipment. These actions ensure that emissions would be within the design standards of all construction equipment. Contractors would be instructed to conduct proper and routine maintenance of all vehicles and other equipment. These actions ensure that emissions would be within the design standards of all construction equipment. Dust suppression methods would be implemented to minimize fugitive dust emissions. Additionally, all construction equipment and vehicles would be required to be kept in good operating condition to minimize exhaust emissions.

COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Environmental compliance for the Proposed Action would be achieved upon coordination of this EA and draft Finding of No Significant Impact (FONSI) with appropriate agencies, organizations, and individuals for their review and comments; USFWS confirmation that the Proposed Action would not be likely to adversely affect any endangered or threatened species; Louisiana Department of Natural Resources concurrence with the determination that the Proposed Action is consistent, to the maximum extent practicable, with the Louisiana Coastal Resources Program; receipt of the Louisiana State Historic Preservation Officer Determination of No Affect on cultural resources; receipt and acceptance or resolution of all USFWS Fish and Wildlife Coordination Act recommendations; and receipt and acceptance or resolution of all Louisiana Department of Environmental Quality comments on the air quality impact analysis documented in the EA. The draft FONSI will not be signed until the Proposed Action achieves environmental compliance with applicable laws and regulations, as described above.

CONCLUSION

The Proposed Action consists of stormproofing at 22 DPS, the Carrollton Frequency Changer Building, the Old River Intake Pump Station, the New River Intake Pump Station, and the Carrollton Water Plant and Power Complex in Orleans Parish, Louisiana. This office has assessed the environmental impacts of the Proposed Action and has determined that the Proposed Action would have no impact upon rare or unique upland resources, fisheries, wildlife, endangered or threatened species, cultural resources, recreational resources, and only a minor, short-term impact to aesthetic resources, air quality, and transportation. Short-term, minor and long-term, moderate adverse effects to the noise environment would be expected primarily due to heavy equipment noise during construction and the operation of proposed stormproofing equipment, such as back-up generators and pumps, during storm events. Short-term, minor, beneficial impacts are anticipated to social and economic resources. The Proposed Action would result in the loss of limited biological production of those areas were facilities are constructed.

PREPARED BY

Table 11 lists the preparers of relevant sections of this report. The point of contact for this EA is Laura Lee Wilkinson, USACE, New Orleans District, Hurricane Protection Office. Ms. Wilkinson can be reached at the U.S. Army Corps of Engineers, New Orleans District; Hurricane Protection Office, P.O. Box 60267, New Orleans, Louisiana 70118.

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Environmental Manager	Lee Walker, Evans-Graves Engineers – HPO
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HTRW	Dr. Christopher Brown, CEMVN
HTRW	Dr. Haekyung Kim, CEMVN
HTRW	Robert Brooks, CEMVN
Environmental Justice Analysis	Getrisc Coulson CEMVN
EA Project Manager	Mike Schulze, ERG
Physical, Biological, and Socioeconomic Resources and Impacts	John MacFarlane, ERG Mike Schulze, ERG Tonya Smith, ERG
Noise	Tim Lavalle, LPES, Inc.
Technical Review	Linda Ashe, ERG Jerry Bolton, ERG Steve Smith, ERG

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APPENDIX A
Maps of Proposed Project Areas

Legend

pump station

Scale: 1:2,000

DPS #1

Basemap Source: USACE 2007

Scale: 1:7,000

Legend

- pump station
- underground ductbank

Earhart Ductbank

Basemap Source: USACE 2007

Legend

- pump station

Scale: 1:2,000

DPS #2

Basemap Source: USACE 2007

Legend

- pump station

DPS #3

Scale: 1:2,000

Basemap Source: USACE 2007

Legend

- pump station

DPS #4

Scale: 1:2,000

Basemap Source: USACE 2007

Legend

- Pump Station
- proposed building and pumps
- proposed water line
- proposed generator

DPS #5

Scale: 1:2,000

Basemap Source: USACE 2007

Legend

- pump station
- proposed radiators and fuel tanks
- proposed generator

DPS #6

Scale: 1:2,000

Basemap Source: USACE 2007

Legend

- pump station
- proposed generator
- fuel tanks to be rehabilitated

DPS #7

Scale: 1:2,000

Basemap Source: USACE 2007

Legend

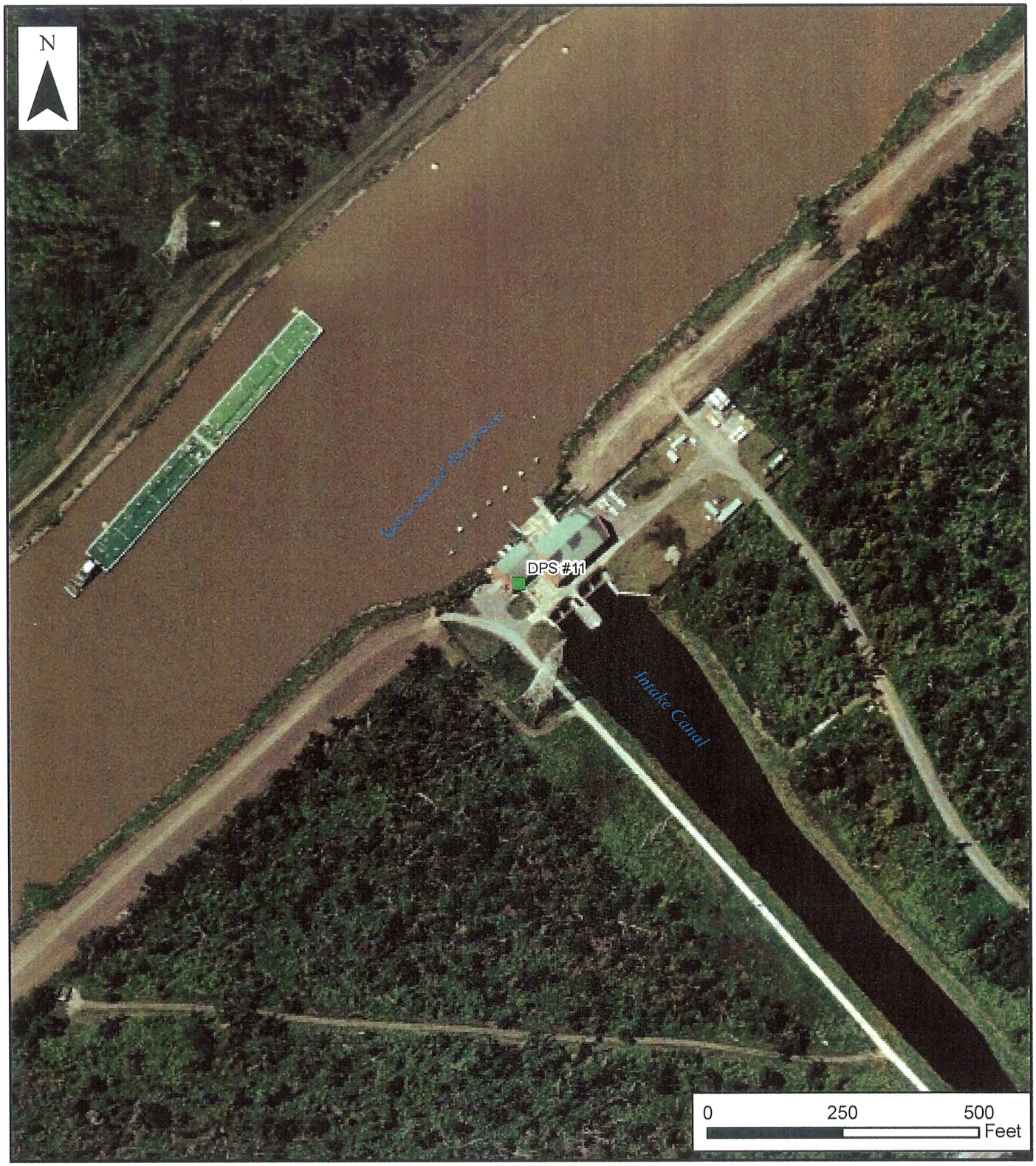
Pump Station

proposed generator

Scale: 1:3,000

DPS #10

Basemap Source: USACE 2007



Legend

- pump station

Scale: 1:3,000

DPS #11

Basemap Source: USACE 2007

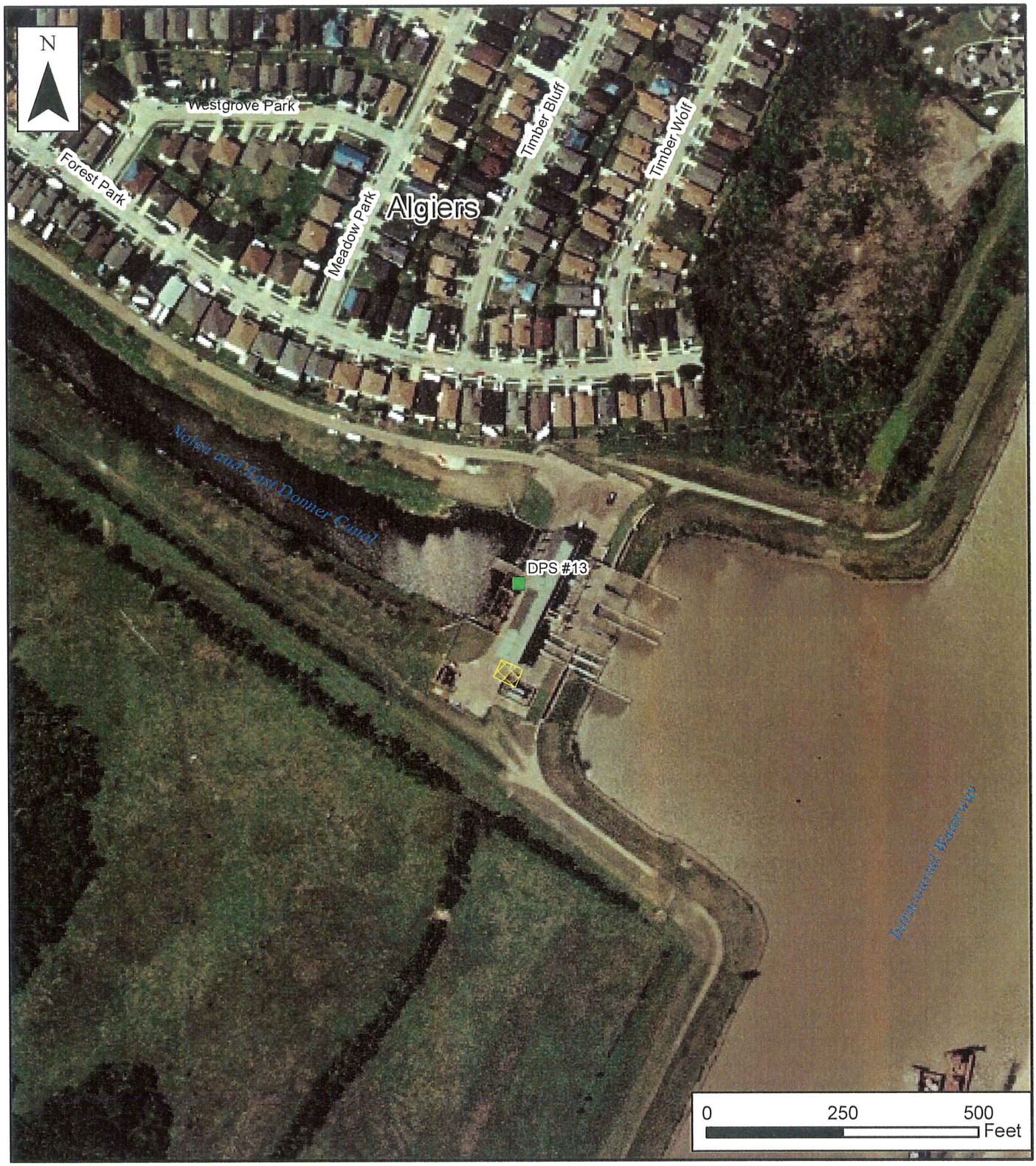
Legend

- pump station

Scale: 1:2,000

DPS #12

Basemap Source: USACE 2007



Legend

pump station

proposed generator

Scale: 1:3,000

DPS #13

Basemap Source: USACE 2007

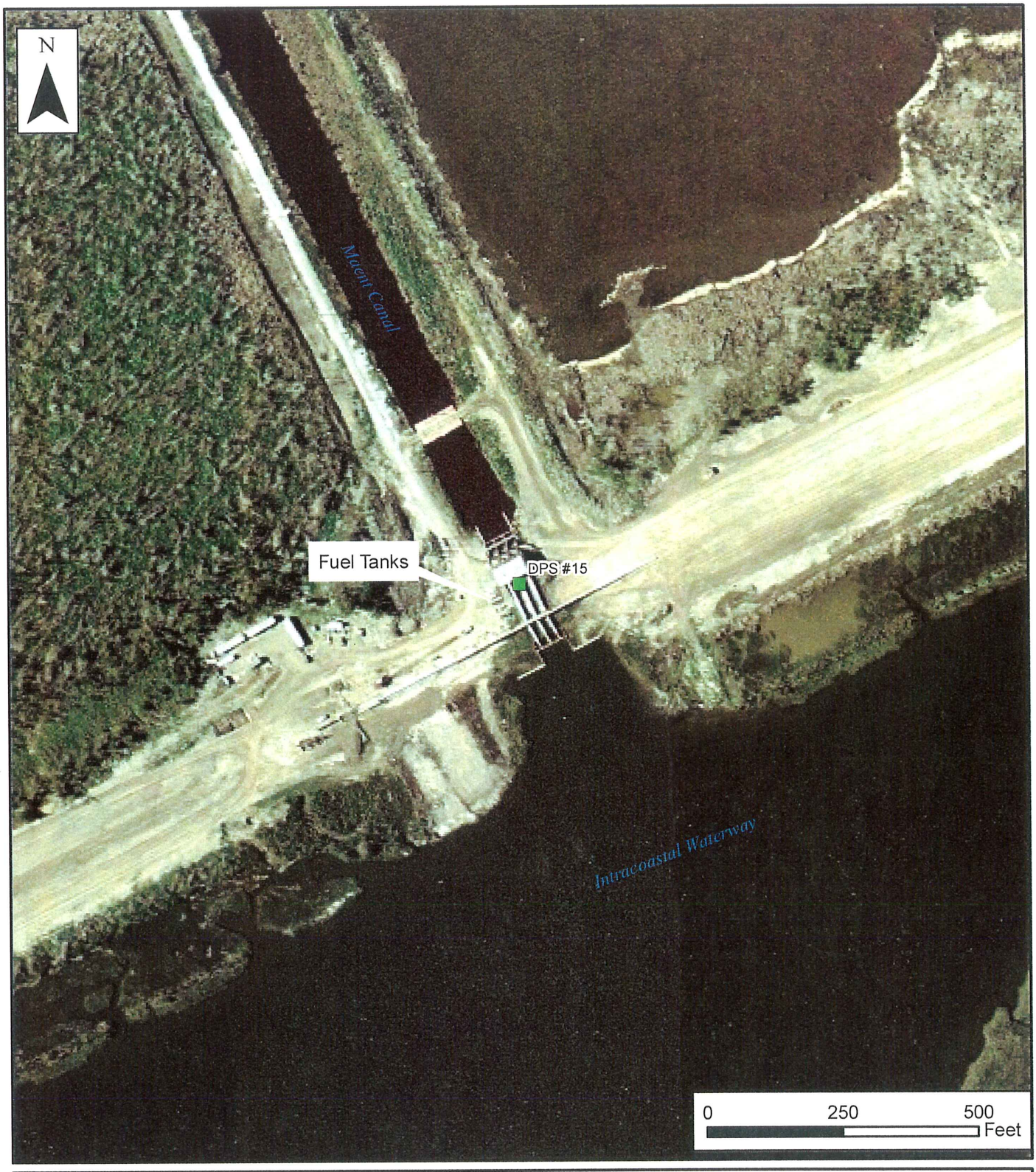
Legend

- pump station

DPS #14

Scale: 1:2,000

Basemap Source: USACE 2007



Legend

- pump station

Scale: 1:3,000

DPS #15

Basemap Source: USACE 2007

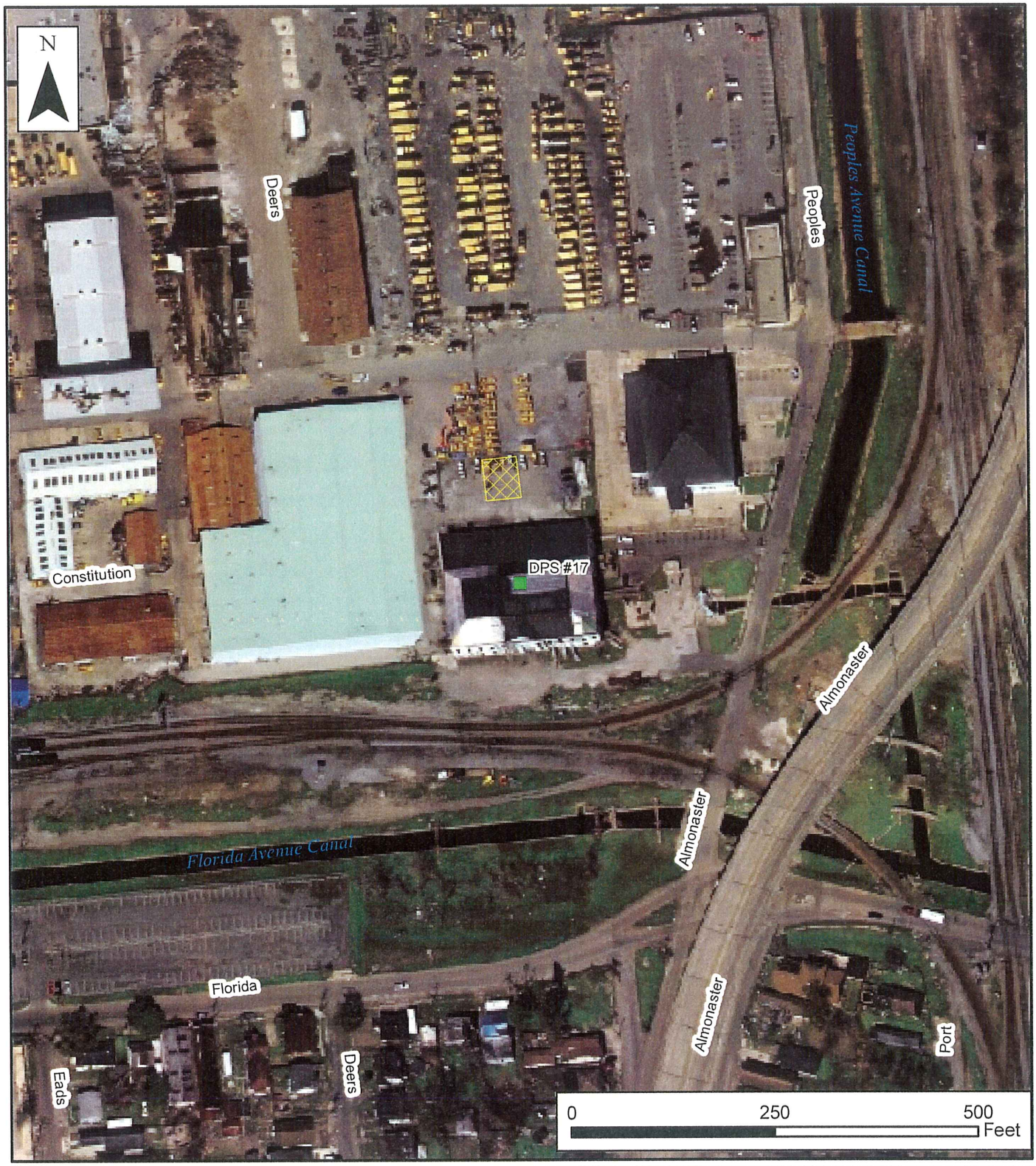
Legend

- pump station

Scale: 1:3,000

DPS #16

Basemap Source: USACE 2007



Legend

pump station

proposed generator building with fuel tanks

DPS #17

Scale: 1:2,000

Basemap Source: USACE 2007

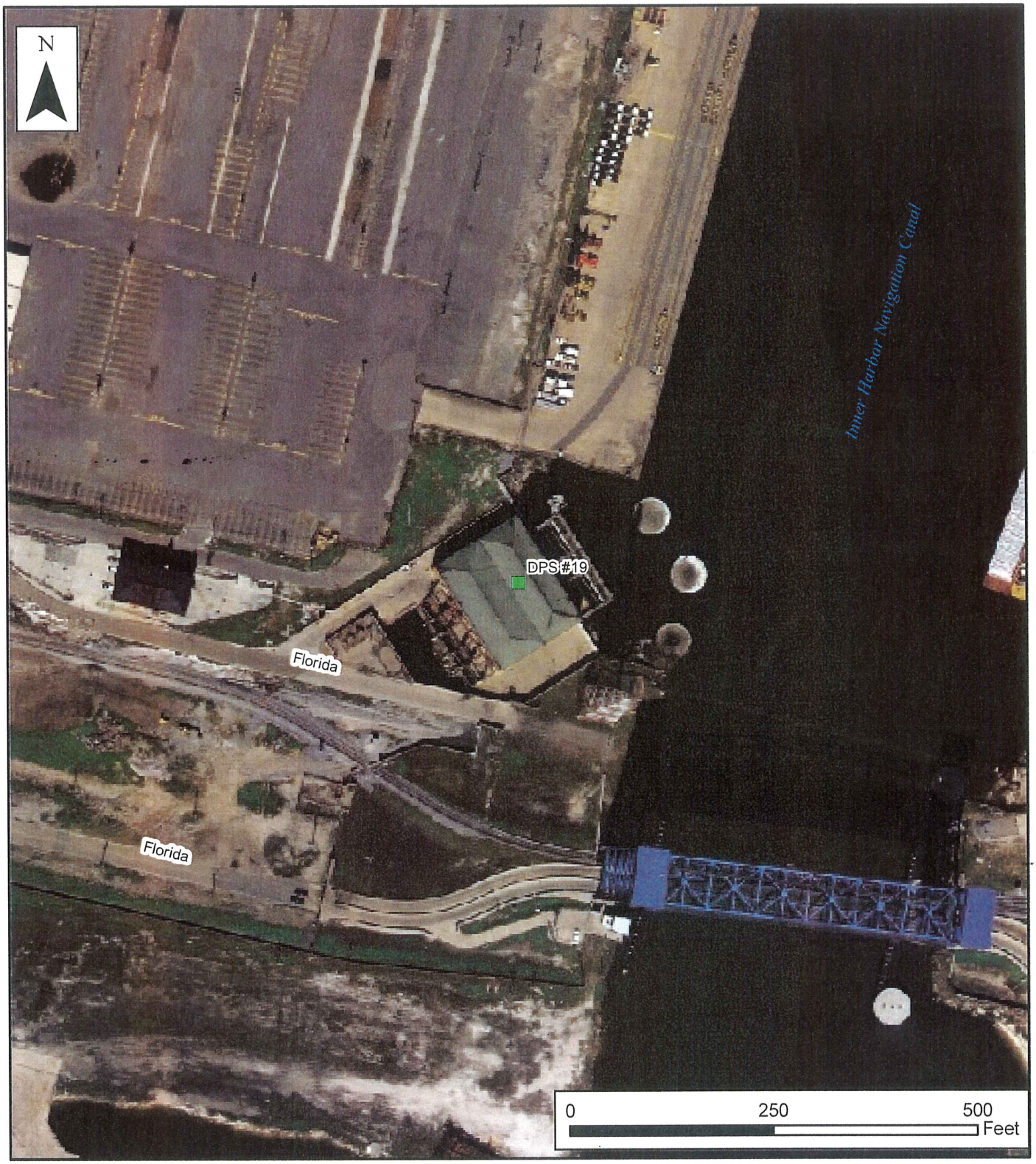
Legend

- pump station

DPS #18

Scale: 1:3,000

Basemap Source: USACE 2007



Legend

- pump station

DPS #19

Scale: 1:2,000

Basemap Source: USACE 2007

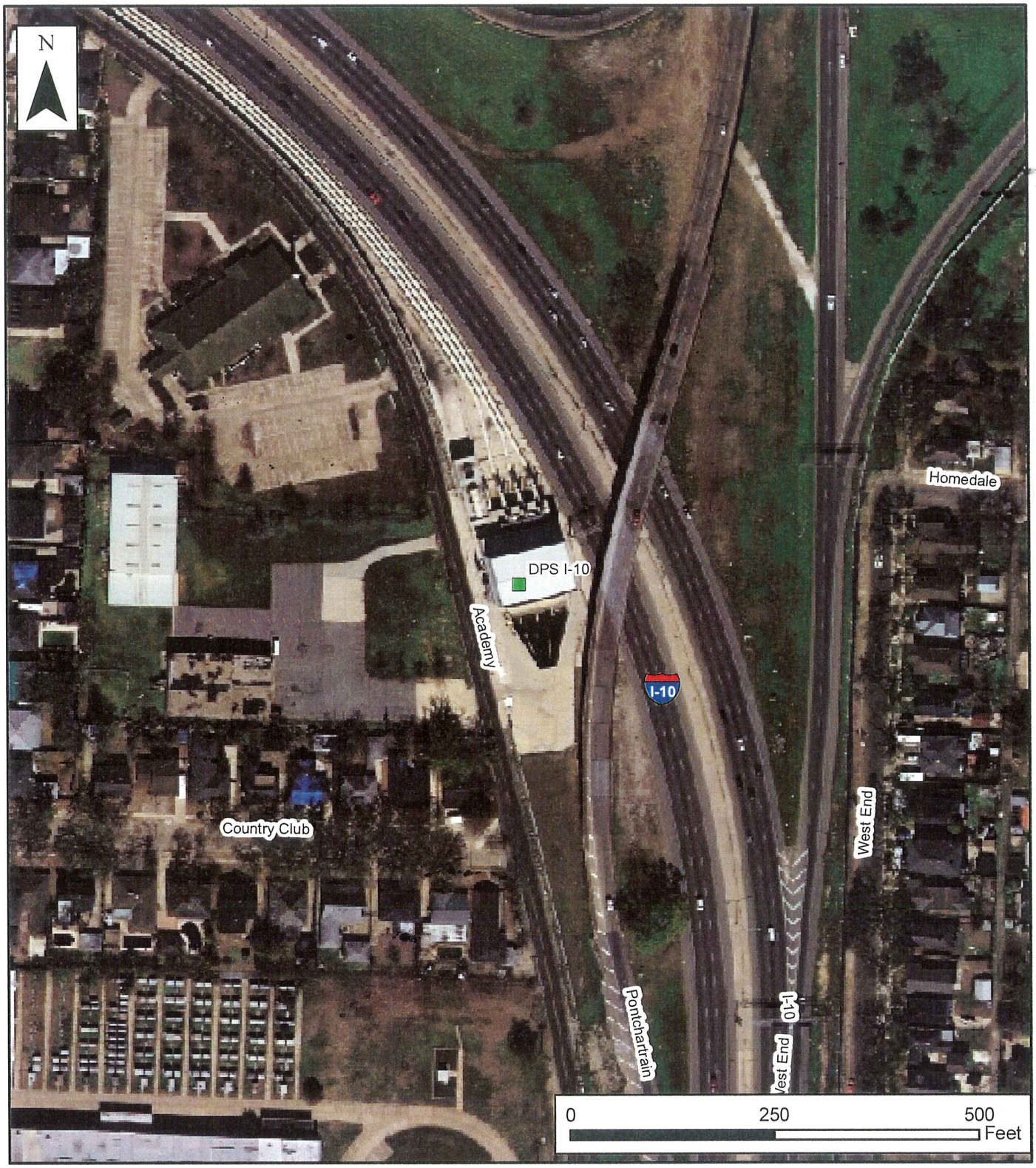
Legend

- pump station

DPS #20

Scale: 1:2,000

Basemap Source: USACE 2007



Legend

- pump station

Scale: 1:2,000

DPS I-10

Basemap Source: USACE 2007

Legend

- pump station

Scale: 1:2,000

DPS Pritchard

Basemap Source: USACE 2007

Legend

- pump station

Scale: 1:2,000

DPS Monticello

Basemap Source: USACE 2007

Legend

- pump station

DPS Grant

Scale: 1:3,000

Basemap Source: USACE 2007

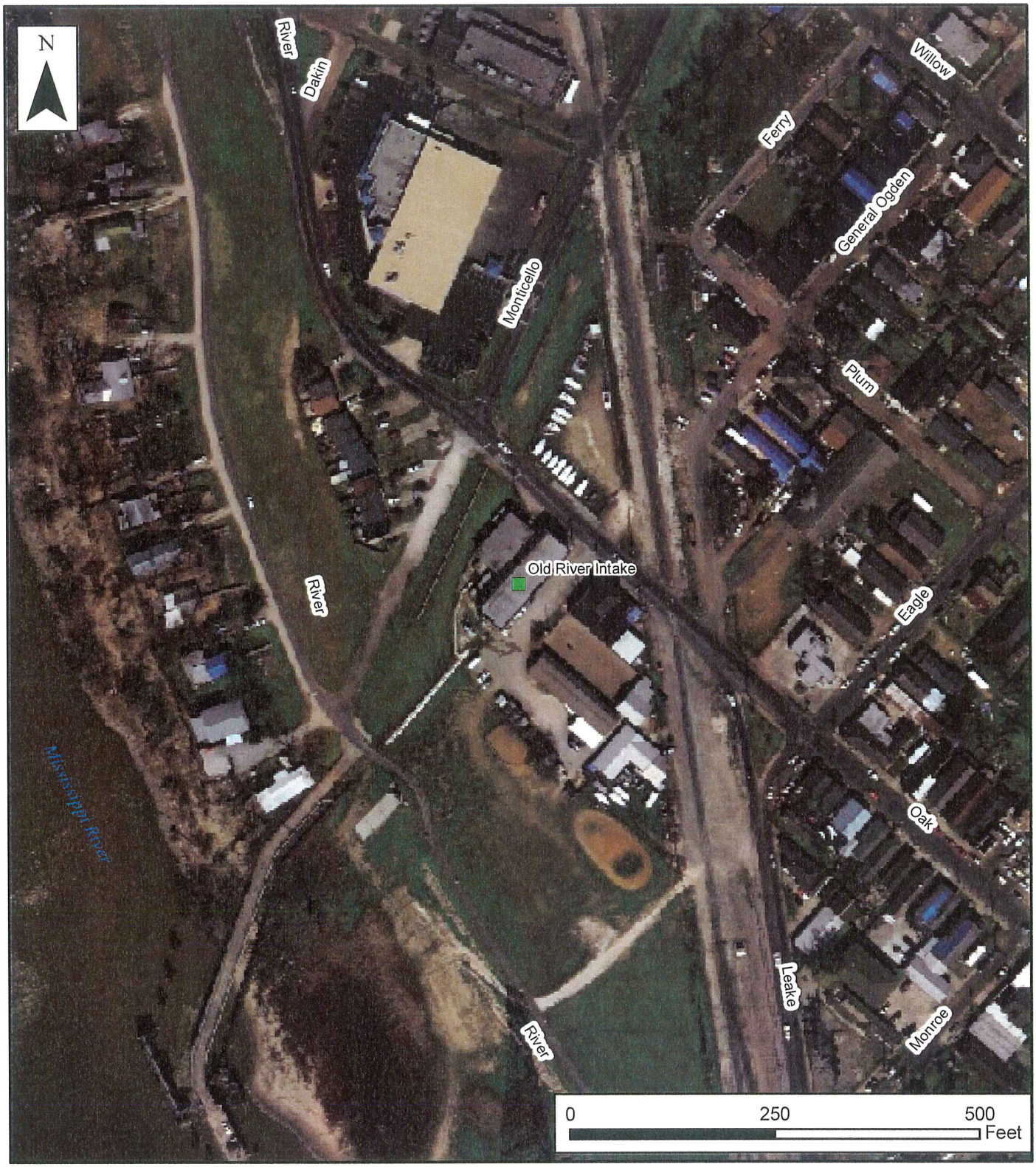
Legend

frequency changer

Carrollton Frequency Changer

Scale: 1:2,000

Basemap Source: USACE 2007



Legend

pump station

Scale: 1:2,000

Old River Intake Pump Station

Basemap Source: USACE 2007

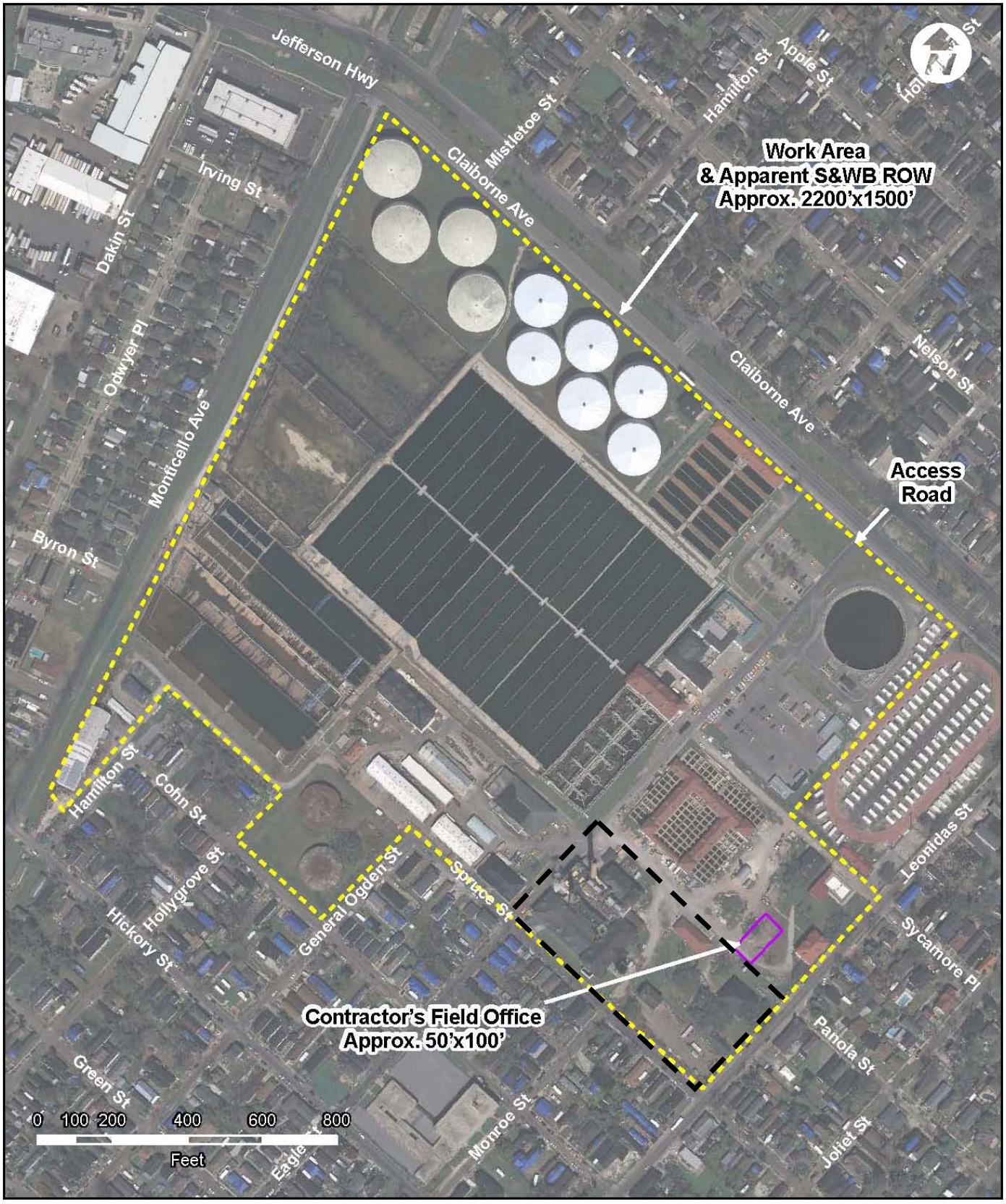
Legend

pump station

Scale: 1:2,000

New River Intake Pump Station

Basemap Source: USACE 2007



Carrollton Water Plant and Power Complex

Legend

- **Previous Perimeter**
- **Revised Perimeter**

APPENDIX B
Example Noise Calculation

Table A-1 Noise Levels at Nearby Receptor (Normal Nonstorm Conditions) – Example Calculation

Non-Storm Conditions	Pump (hp)	Power Requirements (hp)	Number of Motors	Percent Operations
	5,140	7440	5	0.1

Interior Noise				Octave Band Center Frequency, Hz									
				31.5	63	125	250	500	1000	2000	4000	8000	Leq (dBA)
Pumps			CF	13	12	11	9	9	6	9	13	19	
	Rating [hp]	Ko	Lw										
	2,073	89	98.6	85.6	86.6	87.6	89.6	89.6	92.6	89.6	85.6	79.6	96
			PWL	96	97	98	100	100	103	100	96	90	106
Electric Motors			Number of Motors		88.0	90.0	92.0	93.0	93.0	96.0	96.0	81.0	80.0
		0.1	Total Sound Intensity	0.0038	0.0048	0.0061	0.0096	0.0096	0.0191	0.0098	0.0037	0.0009	
			PWL	96	97	98	100	100	103	100	96	90	106
			TL Building (4" Brick)	-25.3	-31.3	-37.3	-43.3	-49.3	-55.3	-61.3	-67.4	-73.4	
PWL Outside Pump Station - From Sources Inside				72	67	62	58	52	49	40	30	18	55

	Feet	Meters								
Distance	450	137								
Hemispherical Spreading	-44	-51	-51	-51	-51	-51	-51	-51	-51	
Atmospheric Absorption	0	0	0	0	0	0	0	0	0	Leq (dBA)
Sound Level	20	15	10	6	0	-3	-12	-22	-34	2.6
									DNL From Proposed Facility	9.0
									Total Leq	58.0
									Total DNL	60.0

Sources: Bies, 2003; and Barron, 2003.

Table A-2 Noise Levels at Nearby Receptor (50% Capacity) – Example Calculation

50% Capacity	Pump (hp)	Power Requirements (hp)	Number of Motors	Percent Operations
DPS 5	2,073	3000	1	0.5

Exterior Noise				Octave Band Center Frequency, Hz									
Generators	**Percent Motors**	**Total Power [bhp]**		**31.5**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**Leq (dBA)**
	1	1500	CF	5	9	3	7	15	19	25	35	43	
Exhaust Noise	Lw	150.5		145.5	141.5	147.5	143.5	135.5	131.5	125.5	115.5	107.5	139
						Muffler Correction	25	25	29	29	27	25	24
			PWL	120.5	116.5	118.5	114.5	108.5	106.5	101.5	92.5	84.5	112
			CF	4	11	13	13	12	9	8	9	17	
Inlet Noise	Lw	110.2	PWL	106.2	99.2	97.2	97.2	98.2	101.2	102.2	101.2	93.2	108
			SI	1.1607	0.4537	0.7111	0.2863	0.0773	0.0578	0.0308	0.0151	0.0024	
			PWL	**121**	**117**	**119**	**115**	**109**	**108**	**105**	**102**	**94**	**113**
Interior Noise													
Generators			CF	22	14	7	7	8	6	7	13	20	
Casing Noise	Lw	123.5	**PWL**	101	109	116	116	115	117	116	110	103	122
Pumps			CF	13	12	11	9	9	6	9	13	19	
	Operating HP	Ko	Lw										
	1,036	89	97.7	84.7	85.7	86.7	88.7	88.7	91.7	88.7	84.7	78.7	95
			PWL	95	96	97	99	99	102	99	95	89	105
Electric Motors		Number of Motors		88.0	90.0	92.0	93.0	93.0	96.0	96.0	81.0	80.0	100
		2.5	Total SI	0.0015	0.0020	0.0025	0.0039	0.0039	0.0078	0.0040	0.0015	0.0004	
			PWL	**92**	**93**	**94**	**96**	**96**	**99**	**96**	**92**	**86**	**102**
		TL Building (4" Brick)		-25.3	-31.3	-37.3	-43.3	-49.3	-55.3	-61.3	-67.4	-73.4	
PWL Outside Pump Station - From Sources Inside				75	70	65	61	55	52	43	33	21	58
			TOTAL SI	1.4446	0.575	0.898	0.381	0.122	0.124	0.066	0.027	0.00	
			TOTAL PWL	122	118	120	116	111	111	108	104	97	116

	Feet								
Distance	450	137							
Hemispherical Spreading	-51	-51	-51	-51	-51	-51	-51	-51	-51	
Atmospheric Absorption	0	0	0	0	0	0	0	0	0	Leq(dBA)
Sound Level	70	66	68	64	58	57	55	51	44	**62.8**
								DNL From Proposed Facility		**69.2**
									Total Leq	**64.0**
									Total DNL	**69.7**

Sources: Bies, 2003; and Barron, 2003.