



**US Army Corps
of Engineers**®
Huntington District

**WILLOW ISLAND LOCKS AND DAM
AND PROPOSED HYDROELECTRIC POWER PROJECT
PLEASANTS COUNTY, WEST VIRGINIA
DRAFT
ENVIRONMENTAL ASSESSMENT**



SEPTEMBER 2010

**DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT CORPS OF ENGINEERS
HUNTINGTON, WEST VIRGINIA**

ABSTRACT

In accordance with the National Environmental Policy Act, the U.S. Army Corps of Engineers (USACE), Huntington District, has prepared this Draft Environmental Assessment (EA) to evaluate the potential environmental impacts associated with the proposed American Municipal Power (AMP) Hydroelectric Power Project, Willow Island Locks and Dam, Pleasants County, West Virginia. A Draft Finding of No Significant Impact (FONSI) has also been prepared and is included within this document.

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TABLE OF CONTENTS

ABSTRACT	II
1.0 INTRODUCTION.....	1
2.0 PROJECT LOCATION AND DESCRIPTION.....	4
2.1 NATIONAL ENVIRONMENTAL POLICY ACT BACKGROUND	4
2.2 CORPS NEPA ACTION UNDER SECTION 408.....	4
2.3 CORPS REGULATORY ACTIONS	5
2.4. REAL ESTATE	5
3.0 AUTHORITIES.....	5
4.0 PURPOSE AND NEED	6
4.1 PURPOSE OF PROJECT.....	6
4.2 PURPOSE AND NEED STATEMENT	6
5.0 DESCRIPTION OF ALTERNATIVES	7
5.1 PROPOSED ACTION ALTERNATIVE (PAA)	7
5.2 NO ACTION ALTERNATIVE	10
6.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES OF PROJECT ALTERNATIVES	11
6.1 SOCIOECONOMIC SETTING	11
6.2 ENVIRONMENTAL JUSTICE	12
6.3 TERRESTRIAL RESOURCES	13
6.4 THREATENED AND ENDANGERED SPECIES	14
6.5 WETLANDS AND AQUATIC RESOURCES	14
6.5.1 Wetlands	15
6.5.2 Aquatic Resources.....	16
6.6 FLOODPLAINS.....	20
6.7 PRIME OR UNIQUE FARMLAND.....	20
6.9 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)	24
6.10 AIR QUALITY	29
6.11 NOISE.....	29
6.12 TRANSPORTATION.....	30
6.13 RECREATION AND AESTHETICS.....	31
7.0 CUMULATIVE EFFECTS	31
8.0 ENVIRONMENTAL REQUIREMENTS AND PROTECTION STATUTES.....	34
9.0 COORDINATION AND CORRESPONDENCE.....	36

10.0 SUMMARY AND CONCLUSION.....	38
12.0 DISTRIBUTION LIST	41
13.0 ACRONYM GLOSSARY.....	43

List of Figures

Figure 1: Location Map.....	2
Figure 2: General Project Plan	3

Appendices

Appendix A	Site Plans
Appendix B	FERC License
Appendix C	Mussel Monitoring Plan
Appendix D	Minimum Flow Release Plan
Appendix E	Water Quality Monitoring Plan
Appendix F	Fish Mortality and Fish Bypass
Appendix G	Prime Farmland
Appendix H	Cultural Resources
Appendix I	HTRW
Appendix J	Recreation Plan
Appendix K	Public Notice
Appendix L	USFWS Coordination
Appendix M	Soil Erosion and Sediment Control
Appendix N	Visual Resource Plan
Appendix O	Wetland Mapping
Appendix P	Revegetation Plan
Appendix Q	State Water Quality Certification

The brief and concise nature of this document is consistent with the 40 CFR requirements of the National Environmental Policy Act (NEPA) to reduce paperwork and delay by eliminating duplication with existing environmental documentation, incorporating pertinent material by reference and by emphasizing interagency cooperation. Data collection and analysis for this document was performed by the U.S. Army Corps of Engineers (USACE) with the assistance of the American Municipal Power, Inc. (AMP), formerly AMP- Ohio, and their consultants.

1.0 INTRODUCTION

The Secretary of the Army is authorized under Section 14 of the Rivers and Harbors Act of 1899 (33 USC 408), referred to herein as “Section 408”, to permit alterations and/or modifications to existing United States Army Corps of Engineers (Corps) projects in certain circumstances. The Secretary of the Army has delegated Section 408 approval authority to the Chief of Engineers. Hydropower projects that will be attached to Corps projects are considered an alteration/modification that requires evaluation and approval by the Chief of Engineers.

On September 27, 1989, the Federal Energy Regulatory Commission (FERC) issued a 50-year License to construct, operate and maintain the Willow Island Hydroelectric Project, Commission Project No. 6902. The original License holder for the project was the City of New Martinsville, West Virginia. The City of New Martinsville has transferred the License to American Municipal Power, Inc. (AMP). AMP, formerly AMP-Ohio, is a not-for-profit wholesale power supplier owned and operated by 128 Member communities that have electrical systems serving customer bases which include commercial, industrial, and residential customers located within and adjacent to their municipal boundaries. The estimated annual generation of 239,000 megawatt-hours would be used to serve the needs of the approximately 17,000 electrical system customers.

When constructed, the Project will be located on the Ohio River at the existing Corps Willow Island Locks and Dam [(Willow Island L&D) (**Figure 1**)] at River Mile (RM) 161.7. The site is downstream of Pittsburgh, Pennsylvania and 3.4 miles upstream from Waverly, West Virginia. This non-federal hydropower plant qualifies as an alteration/modification of a Corp project, and thus it must undergo evaluation under Section 408. The Corps review under Section 408 includes, but is not limited to the following: analysis of potential hydrology and hydraulic changes, engineering design evaluation, and analysis and evaluation of potential environmental impacts. In addition to a License from FERC and the Corps Section 408 approval, the project requires a Department of the Army permit from the Corps subject to Section 404 of the Clean Water Act (CWA) (33 USC 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403).

FERC completed an Environmental Impact Statement (EIS) in 1988, which documented the effects hydroelectric development in the Upper Ohio River Basin, this document included Willow Island L&D. However, because the EIS is dated, completed in 1988, and the scale and scope of EIS was very broad, the Corps has determined that an updated and site specific

analysis must be completed. This EA will determine if further documentation in the form of an EIS is needed to fulfill agency NEPA requirements.

Figure 1: Location Map

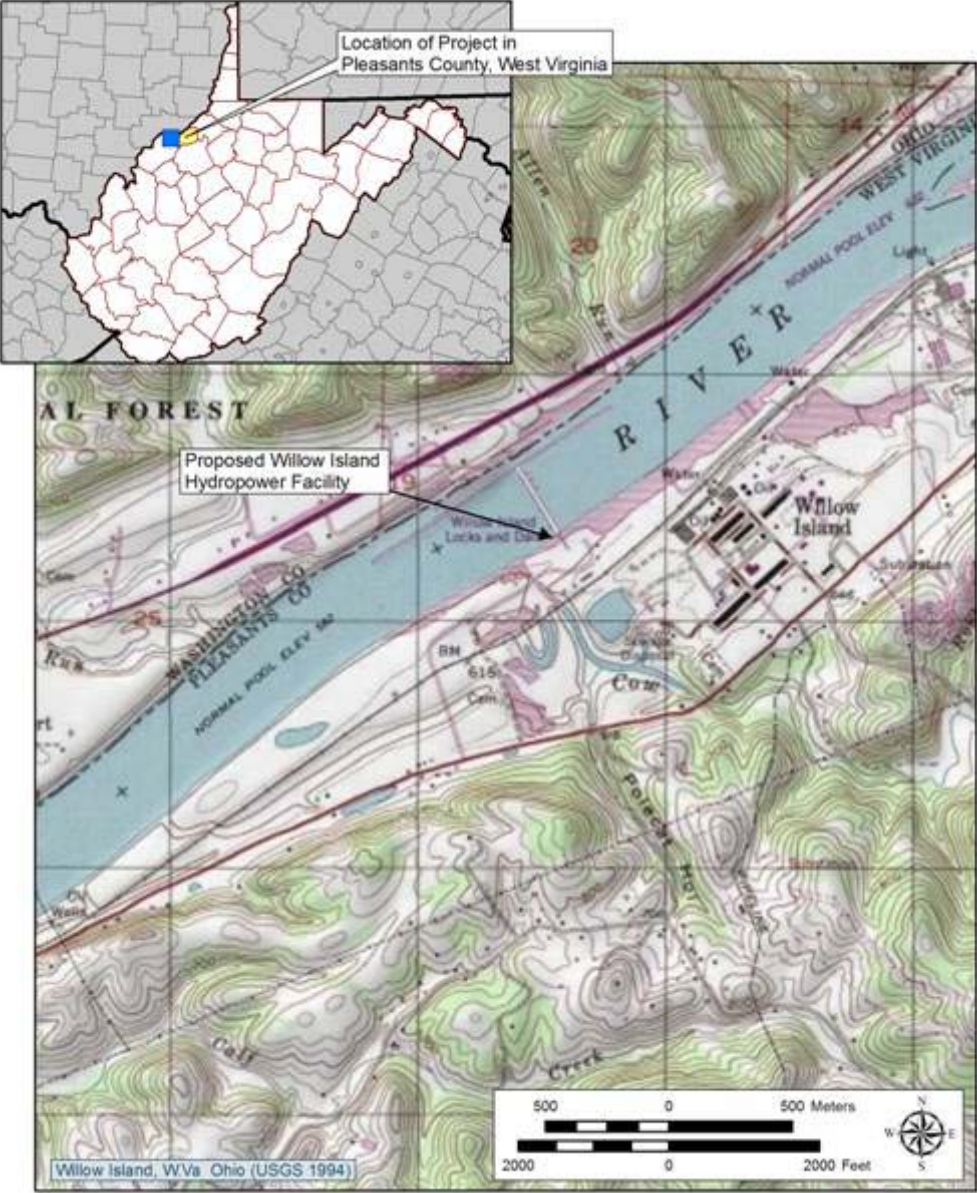
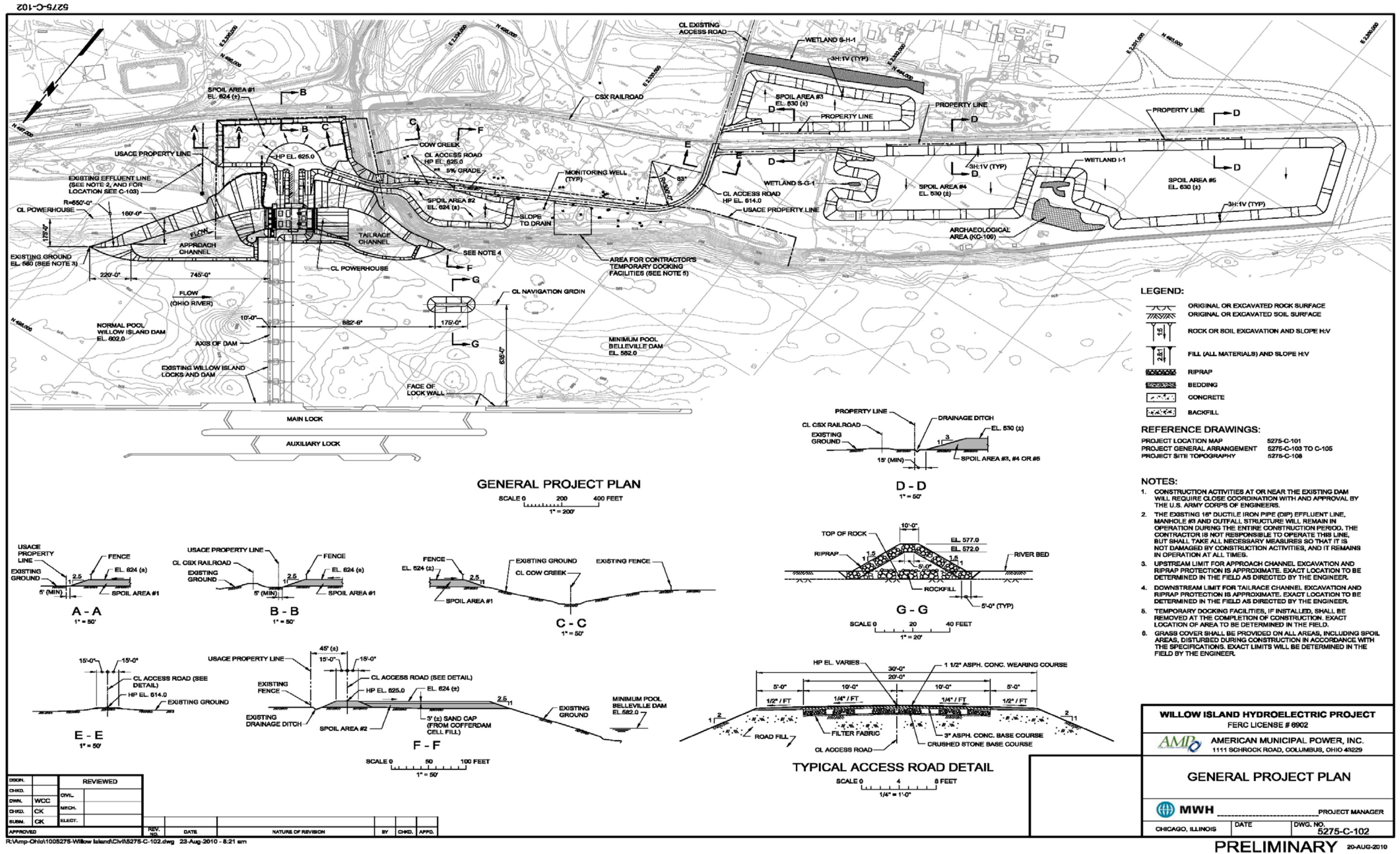


Figure 2: General Project Plan



2.0 PROJECT LOCATION AND DESCRIPTION

The proposed project is located along the left descending bank of the Ohio River, adjacent to the existing Willow Island L&D project (**Appendix A, Site Plans, General Project Plan**), 161.7 miles downstream of Pittsburgh, Pennsylvania near Waverly, Pleasants County, West Virginia. The project would be constructed on federal lands administered by the Huntington District of the Corps. The project would consist of the following: temporary construction features, including a temporary cofferdam and a temporary barge unloading area; a powerhouse; new transmission line; an excavated approach channel to the hydropower plant and an excavated exit channel; a permanent road crossing; and temporary and permanent recreational facilities. The proposed project would also include the construction of a navigation groin. This type of structure is necessary to mitigate for discharge impacts from the hydroelectric plant. Construction is projected to take four years and would require the excavation of approximately 815,000 cubic yards of soil, sediment and rock. Excess material resulting from project excavation would be placed in identified disposal areas located on both Federal and private property. A detailed description of the project features of the proposed action is included in Section 5, Description of Alternatives.

2.1 National Environmental Policy Act Background

In accordance with the National Environmental Policy Act of 1969 (NEPA) and FERC regulations, an Environmental Impact Statement (EIS) was prepared to document the effects of hydroelectric development in the Upper Ohio River Basin (FERC, 1988), which includes Willow Island L&D, for the licensing action by FERC. Subsequently, the Order Issuing License (FERC License) for the construction of the Willow Island hydroelectric project (FERC Project No. 6902-0031) was issued to the City of New Martinsville, West Virginia on September 27, 1989 and subsequently transferred to AMP. The FERC License (1989) is included in **Appendix B, FERC License**.

2.2 Corps NEPA Action under Section 408

As required by a 1981 Memorandum of Understanding (MOU) between FERC and the Department of the Army, FERC includes special license conditions for hydroelectric projects developed at Corps facilities. These conditions are required to ensure that the proposed hydropower project does not adversely affect the operation of the Corps project, as required by 33 USC 408.

The Corps procedures for implementing NEPA (30 CFR 230) allows the agency to adopt another agency's NEPA document to support Corps decisions if that document is found to be technically and procedurally adequate per Corps regulations. The Corps reviewed the FERC EIS, with intent to meet NEPA requirements through the adoption of these documents. However, because the EIS is dated, completed in 1988, and the scale and scope of EIS was programmatic in nature, the Corps has determined that an updated and site specific analysis must be completed. This EA will determine if further documentation, in the form of an EIS, is needed to fulfill agency NEPA requirements. This EA, consistent with 40 CFR 1508.28, tiers from and supplements the FERC EIS.

2.3 Corps Regulatory Actions

Construction of the proposed hydropower facility will require the placement of dredged or fill material into “waters of the United States” (WOUS), including wetlands; therefore, the licensee must obtain authorization for this project under Section 404 of the CWA. In addition, a portion of the proposed facility will be located within navigable waters (Ohio River) of the United States; therefore the licensee must also obtain authorization for this project under Section 10 the Rivers and Harbors Act. This EA will be used to fulfill NEPA requirements associated with the Corps regulatory action as well as the decision under Section 408. Full consideration of CWA Section 404(b)1 guidelines is required as an integral part of the permitting process and will be documented in an evaluation prior to concluding the NEPA process and prior to Corps final decision on the permit application. The Section 404(b)1 document is being prepared and can be made available upon request.

2.4. Real Estate

The Federal Energy Regulatory Commission (FERC) under the Federal Power Act (41 Stat. 1063, 16 U.S.C. Sec 791-823, June 10, 1920, as amended), issued a license to the City of New Martinsville, West Virginia, for the design, construction, and operation and maintenance of a proposed 35-megawatt hydroelectric power facility at the Corps of Engineers, Huntington District, Willow Island Locks and Dam Project, on or about September 27, 1989. As required under Article 306 of the license, the City of New Martinsville, West Virginia, entered into a Memorandum of Agreement (MOA), on or about March 20, 1990, with the U.S. Army Corps of Engineers and in accordance with ER 1110-2-1454, dated July 15, 1983. On February 17, 2009, the FERC approved transfer of the License from Martinsville, West Virginia to AMP-Ohio, Inc., n/k/a American Municipal Power, Inc. (AMP).

3.0 AUTHORITIES

The following is a list of authorities that are relevant to the proposed action:

- Rivers and Harbors Act of 3 March 1909, Sixtieth Congress, 2nd Session - Authorized the construction Willow Island Locks and Dam;
- The Federal Power Act, 16 USC. 791 et seq. - Authorizes the development of non-Federal hydroelectric generating facilities at eligible Federally-owned reservoirs;
- Section 14 of the Rivers and Harbors Act of 1899 (33 USC. 408) - Requires approval by the Chief of Engineers for any request to significantly modify or alter a locally or federally maintained Corps projects;
- Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) – Directs the Corps

to regulate all work or structures in or affecting the course, condition or capacity of navigable waters of the United States (U.S.);

- Section 404 of the Clean Water Act (33 USC 1344) – Directs the Corps to regulate the discharge of dredged or fill material into all waters of the United States, including wetlands.

4.0 PURPOSE AND NEED

4.1 Purpose of Project

PJM Interconnection (PJM), which is a regional transmission organization, would coordinate the movement of the electricity generated by the Willow Island L&D Hydroelectric Project (Project). PJM coordinates the wholesale electricity in all or parts of 13 states and the District of Columbia.

The North American Electric Reliability Council (NERC) forecasts electrical supply and demand nationally and regionally for a 10-year period. Within the NERC organization, the Ohio River in the vicinity of the project forms part of the border between two regions: the Reliability First Region and Southeastern Electric Reliability Council (SERC). NERC's 2007 forecast includes a reserve margin goal of 15 percent for the Reliability First, and the region's projected electrical resources are forecasted to fall below this goal by the year 2012. Below the reserve margin, NERC anticipates that electrical demand may exceed supply in a summer peak load or emergency situation, so incremental resources would need to be added to the electrical grid to meet demand. The amount of incremental resources that would be needed increases from 1,500 MW in 2013 to 11,100 MW in 2016.

The Willow Island L&D hydroelectric project would provide an installed capacity of 35 MW and a net generation of approximately 239,000 megawatt-hours (MWh) per year. An analysis conducted by FERC concluded that the project would help meet a need for power in the Reliability First Region over the term of the license. Analysis shows the Project is above market prices for approximately seven years but then goes below market pricing for the rest of the life of the power plant and would diversify the generation mix.

4.2 Purpose and Need Statement

The purpose of agency action is to comply with the statutes listed below. The need for this assessment is to assure that the modification to the Willow Island structure: 1) does not impair the usefulness of such work; 2) does not conflict with the "waters of the United States." which are protected from indiscriminate discharge; and, 3) does not significantly affect the navigational capacity of the Ohio River, a navigable water.

- A request to significantly modify or alter a locally or federally maintained Corps project requires approval by the Secretary of the Army under 33 U.S.C. 408. Under the terms of 33 USC 408, any proposed modification to a Federal project requires a determination that such proposed alteration or permanent occupation or use of a Federal

project is not injurious to the public interest *and* will not impair the usefulness of such work. The authority to make this determination and to approve modifications to Federal projects under 33 USC 408 has been delegated to the Chief of Engineers.

- The Corps is also directed by Congress under Section 404 of the Clean Water Act (33 USC 1344), to regulate the discharge of dredged and fill material into all waters of the United States, including wetlands. The intent of the law is to protect the nation's waters from the indiscriminate discharge of material capable of causing pollution and to restore and maintain their chemical, physical and biological integrity.
- The Corps is also directed by Congress under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403), hereby referred to as a "Section 10" permit, to regulate all work or structures in or affecting the course, condition or capacity of navigable waters of the United States. The intent of this law is to protect the navigable capacity of waters important to interstate commerce.

5.0 DESCRIPTION OF ALTERNATIVES

Due to the specific constraints with respect to hydropower generation, the Proposed Action Alternative is the only reasonable alternative that will meet the project's purpose and need. Possible project alternatives were explored in further detail within the 1988 EIS associated with the FERC licensing action. All alternatives were dismissed except for the project currently proposed. Therefore, only the Proposed Action and No Action Alternatives were developed and carried forward for detailed evaluation in this document.

5.1 Proposed Action Alternative (PAA)

The proposed Willow Island hydroelectric project as described in the FERC License (1989) would be constructed on the south shore of the Ohio River in the State of West Virginia. The Proposed Action Alternative (PAA) would consist of a 980-foot-long approach channel, leading to an intake structure equipped with trash racks with eight-inch bar spacing; a 256-ft-long by 136-ft-wide and 101-ft high powerhouse, integral with the dam, and containing two horizontal turbine-generating units with a total installed capacity of 35 Megawatt (MW) discharging into a 865-ft-long tailrace channel. Project power will be transmitted through a 1.6-mile long, 138-kilovolt (kV) transmission line to a new switching station to be located south of State Route 2, approximately 1,500 ft. to the existing Monongahela Power Company Substation. A detailed description of the individual project features are provided below.

Temporary Construction Features (Appendix A, Site Plans, Proposed Temporary Construction Features): In order to construct the proposed powerhouse, the applicant proposes to install a temporary cofferdam. The proposed cofferdam would extend approximately 325 ft upstream and approximately 515 ft downstream of the Willow Island L&D dam. The cofferdam would temporarily block spillway Bay 8 thus taking it out of service during construction. Fill material would also be placed within spillway Bay 8 to

assist in maintaining the stability the cofferdam while it is dewatered. Portions of the proposed cofferdam would be constructed using barge-mounted equipment working in the river. The landside portion of the cofferdam would be constructed by excavating approximately 63,000 cubic yards of material from the existing shoreline. A cut-off wall would be installed along the centerline of the landside cofferdam and would extend to bedrock. The riverside of the cofferdam would be constructed of approximately fifteen 63 foot diameter sheet pile cells. The cells would be constructed by driving sheet piles into bedrock and backfilling the cells with free-draining materials. Fill material for the coffer dams and Bay 8 will be obtained from off-site commercial sources. Riprap would be placed along the riverward face of the cells to prevent scouring. An impervious fill berm would be placed on the inside of the cells to bolster their stability to the 100-year design flood elevation, once the area within the cofferdam is dewatered. Timing for placement of the fill berms (before or after dewatering), will be determined based on stability requirements for the cells. A dewatering system and flood control structure would be installed on the downstream side of the cofferdam.

Once dewatered, the above referenced area would be excavated for construction of the proposed powerhouse. Unsuitable foundation material would be removed by conventional landside excavation or dredging from the footprints of the landside and cellular cofferdams and the remaining material will be transported to permanent spoil areas identified on the site plan as Spoil Areas 1 thru 5. Riprap within the footprint of the cofferdam would be removed and stockpiled for future use. Approximately 150 linear feet of the upstream embankment and 200 linear feet of the downstream embankment for the cofferdam would be protected with riprap or other bank stabilization materials.

Construction of the proposed project will include a temporary barge unloading facility (**Appendix A, Site Plans, General Project Plan**). This facility would be used to unload the turbine/generator parts and other construction equipment. Two existing concrete-capped coffer cells for a fixed weir section of the dam are located on the left descending bank of the river. These cells would be demolished in conjunction with the excavation activities for the proposed powerhouse. Once the powerhouse construction is complete, the cofferdams would be removed. Materials from within the cells and from the stabilizing berms would be placed in Spoil Areas 1 thru 5, as well as being utilized to place a 3-foot cap on Spoil Area 2. Sheet pile material would be salvaged.

Powerhouse: The proposed powerhouse would be built into the existing shoreline and would contain two 17.5 Megawatt generating units. A proposed intake trash rack, intake bulkhead, emergency closure gate and a draft tube bulkhead would be installed. The concrete reinforced powerhouse would be founded on bedrock and would enclose two horizontal shaft bulb turbines. The applicant has indicated the proposed powerhouse would also contain two oil water transformers, an oil purification system, a closed coolant system, digital governors, and a reserve auxiliary transformer with a connection to the local power distribution system. Retaining walls would be constructed along the landward side of the powerhouse, upstream and downstream of the structure. A permanent sheet-pile cutoff would be installed in the bank and would tie into the upstream retaining wall adjacent to the

powerhouse. A concrete gravity dam would tie the powerhouse to the existing dam. Backfill material for the powerhouse would be obtained from off-site commercial sources.

Transmission Line: The proposed project would include a new transmission line that would extend from the proposed powerhouse approximately 1.6 miles to an existing underground transmission line (**Appendix A, Site Plans, Transmission Line**). The route of the proposed transmission line is shown in the attached drawings.

Approach and Exit Channels: The proposed project would include the excavation of a 980-foot-long approach channel upstream of the proposed power house and the excavation of an 865-ft.-long exit channel downstream of the proposed power house. The approach channel would vary in widths from 122 feet to 320 feet. The proposed exit channel would vary in width from 114 ft. to 190 ft. The approach and exit channels within the area of the cofferdam would be excavated in conjunction with the powerhouse construction. Outside the cofferdam footprint, the channels would be excavated by conventional dredging or a clamshell dredge. Excavation will be completed during periods of low-water and a sediment curtain will be installed to reduce turbidity. Any excavated materials would be spoiled in the areas 1 thru 5 identified on the attached drawings. Permanent slope protection would be added to the shoreline adjacent to the proposed approach and exit channels. Approximately 750-ft of the river bank adjacent to the approach channel would be protected with riprap or other bank stabilization materials. The landside bank of the approach channel would terminate at the proposed concrete retaining wall of the proposed powerhouse. The proposed bank stabilization measures would include approximately 9,800 cubic yards of rip rap and 4,900 cubic yards of bedding. Installation of the approach channel would impact approximately 0.07 acres of one wetland.

Spoil Areas: Approximately 815,000 cubic yards of spoil material would be generated in order to construct the proposed project. A total of five spoil areas have been identified (**Appendix A, Site Plans, Proposed Spoil Areas**). Spoil Areas 1 and 2 are located on Federal property managed by the Corps. Spoil Areas 3, 4 and 5 are privately owned and located adjacent to the proposed project site. Approximately 81.6 acres of land is required in order to receive the excess spoil material. Spoil Areas 1, 3, 4 and 5 would be used to permanently spoil excavated material during project construction. Spoil Area 2 would be used to both stockpile excavated material during project construction, as well as a permanent spoil area. Once the powerhouse construction is complete, the temporary cofferdams would be removed and material from within the cells would be used to cap Spoil Area 2 with three feet of material. Spoil Area 2 would also be developed into a permanent recreation area.

Road Crossing: An existing culvert within Cow Creek would be extended to accommodate the construction of a wider access road. The proposed culvert would consist of corrugated metal similar to the existing culvert. Reinforced concrete wing walls would be constructed at the upstream end of the culvert. Installation of the culvert would impact approximately 110 linear feet of Cow Creek and 0.03 acres of one wetland abutting Cow Creek.

Recreational Facilities: As required by the FERC license, the proposal includes temporary and permanent recreational facilities.

Temporary Recreational Facilities (Appendix A, Site Plans, Proposed Temporary Recreation Facilities): The proposed temporary recreational facilities are intended to replace the function of existing recreation opportunities in the project area, which would be impacted by the project construction (Refer to Section 6.13, Recreation and Aesthetics), for the duration of construction. These facilities would include a parking area, access trail, and a fishing pier. These temporary facilities would be installed downstream of the proposed powerhouse prior to construction. The proposed fishing pier would be a steel 150-ft long, 8-ft wide catwalk structure extending into the River at an angle. The proposed walkway would be approximately 130-ft long and would consist of a 4-ft wide gravel pathway. The majority of the features for the temporary recreational facility would be constructed using land-based equipment. The proposed fishing pier would be installed by working from, small barges and boats in the river.

Permanent Recreational Facilities (Appendix A, Site Plans, Proposed Permanent Recreation Facilities): The proposed permanent recreational facility would include a fishing pier, a paved walkway, a parking area, access path, and public restrooms. The permanent fishing pier would be the same pier constructed for the temporary recreational area. The proposed walkway would extend along approximately 200-ft of shoreline and would consist of a 4-ft wide concrete pathway. The armoring of the downstream riverbank, adjacent to the exit channel, would include minor variations in the stepped slope to provide fish attractant areas.

Navigation Feature: The proposed project would also include the addition of a navigation feature/groin. This feature would be added, if needed, to mitigate for any impacts of the powerhouse discharge flow on the navigation of barges and tows in and out of the existing lock. The applicant has indicated the proposed groin would be approximately 280-ft long and would be constructed of approximately 13,100 cubic yards of rock fill covered with approximately 5-ft or 9,400 cubic yards of rip rap. Installation of this feature would include the removal of approximately 8,000 cubic yards of unsuitable foundation material within the River. This material would be removed by either conventional hydraulic dredging or clamshell equipment working in the river. The navigation groin would also be installed by equipment, i.e. barges, working in the river. No dewatering is proposed for this construction.

5.2 No Action Alternative

Under the No Action Alternative, the Corps would not issue the permits and approvals under its respective authorities, and the project would not be constructed.

6.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES OF PROJECT ALTERNATIVES

6.1 Socioeconomic Setting

Affected Environment

The proposed hydropower project is located on the south shore of the Ohio River in Pleasants County, West Virginia. The setting is generally rural and remote. However, the adjacent property to the east has an industrial facility of 1,000 acres, Cytec Industries, and has been in operation since 1947. The facility serves as a multi-process chemical plant that has produced a variety of organic and inorganic chemical products.

No statistics were available for the Project Area from the U.S. Census Bureau (2000), however the project area is expected to be mirror Pleasants County which includes the following: population of 7,514, which resides in 3,214 households, resulting in a density of 57.4 people per square mile; and Caucasian (98.3%), and the majority of the population is between the ages of 18 and 65 (70%). In addition, 11 percent of the population lives below the poverty level (U. S. Census Bureau, 2000). The median annual household income for Pleasants County is \$37,795 (U. S. Census Bureau, 2000). Ninety-three percent (93%) of the residents own their homes (U. S. Census Bureau, 2000), with a median value of \$75,300 (U. S. Census Bureau, 2000).

Project Consequences

Construction of the proposed hydropower facility will allow AMP to diversify their generation mix which would displace electrical production from non-renewable, fossil-fueled resources, reduce greenhouse gas emissions and conserve fossil fuels. In addition, the FERC License (1989) requires the Licensee to develop a recreation mitigation plan to offset impacts to the existing recreation opportunities at the site. Improvements to existing recreational opportunities at the site could potentially generate a loyal user base that may contribute economically to the local community during visits to the Project Area. Therefore, the construction of the hydropower project and associated improvements to recreational facilities at the site could have a positive economic benefit to this rural community.

The project is expected to employ about 50 people during the first year of construction. These 50 individuals would be from local labor unions. In addition to this phase, there would be seven to ten engineers employed that would move into the area or be from the Pleasants County area. Once the cofferdam excavation is completed, additional workers will join those already employed at the site, bringing the total employee numbers up to about 200 per shift or nearly 400 per day. This level of staffing will last for approximately 30 months and will be drawn from the local labor unions. As construction nears to completion, the labor force will gradually decrease. During the startup phase, approximately 50 people will remain employed until the plant is commercially operable.

After the plant is commercial, seven to nine employees will remain to operate the plant for its 50 to 75 year economic life. Displacement of workers from other sectors of the electrical production is not expected. The demand for energy in the United States is increasing and additional generating facilities are required to meet that demand. However, new generation facilities are not being built at the same rate as they are being retired. The resultant outcome will be lower reserve margins. As existing plants utilizing non-renewable fuel become older and uneconomical to operate, they will continue to be closed and jobs will be lost. Rather than displacing jobs at existing generation facilities, the proposed hydropower generation facility will be expected to provide for an *additional* 7-9 additional plant operation jobs. Jobs lost due to existing plant retirements could be replaced by the hydroelectric plant when operational.

During scheduled outages, additional local labor would be brought in to assist. Depending upon the work to be undertaken in the outage, employee counts may be as high as 50 during these periods. As a result of these workers, additional local economy jobs would be created due to the increased worker presence in the county. It is commonly estimated that seven to ten additional jobs will be added to the local economy for each construction job and for each long term job. These jobs would be generated in service sectors like restaurants, gas stations, retail facilities, housing, groceries, retail, auto repair, shopping, etc.

Under the No Action Alternative, the current socio-economic conditions are expected to remain the same. No project related temporary or long-term economic benefits and jobs would be realized.

6.2 Environmental Justice

Affected Environment

Under Executive Order (EO) 12898 “Federal Action to Address Environmental Justice in Minority Populations and Low Income Populations,” federal agencies are directed to identify, address, and avoid disproportionately high and adverse human health or environmental effects on minority and low income populations. As detailed in Section 6.1, the population within the project area is Caucasian, almost 100 percent, and is characterized as a low to moderate income community.

Project Consequences

The proposed hydropower project would allow AMP to construct and operate a facility that could reduce the consumption of fossil fuels to generate power. The potential reduction in greenhouse gas emissions will benefit the community and the region regardless of minority and/or low income status. Therefore, there would be no disproportionately high adverse health or environmental effect on minority or low income populations from the proposed project.

Under the No Action alternative, no effects to minority and low income populations would result from project implementation.

6.3 Terrestrial Resources

Affected Environment

The terrestrial resources at the site were significantly disturbed during construction of the Willow Island L&D between 1967 and 1976. The area surrounding the dam's left abutment, proposed powerhouse location, was used for spoil disposal during construction of the Willow Island L&D facility. This area currently supports sparse herbaceous vegetation. Adjacent areas to be impacted by the proposed Project are also sparsely covered in second growth riparian forest assemblage typically found along the Ohio River.

Project Consequences

Given the general lack of available habitat in the project area, wildlife species populations are expected to be minimal. Such wildlife inhabiting the Project area may include, but would not be limited to muskrat (*Ondatra zibethicus*), white-tailed deer (*Odocoileus virginianus*), Eastern gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), and wild turkey (*Meleagris gallopavo*). Canada geese (*Branta Canadensis*), mallard (*Anas platyrhynchos*), and black duck (*Anas rubripes*) overwinter on the river upstream of the Project. These species would be disturbed by loss of habitat, noise, and movement during construction. Construction related effects would have only have a minor adverse impact on vegetation and wildlife resources in the area. Moreover, the limited effects on vegetation and wildlife resources are expected to be offset through the re-vegetation program developed by the licensee to satisfy FERC license Article 417 (**Appendix P - Revegetation Plan**). This article requires the Licensee to develop a plan to revegetate all exposed soil areas disturbed during construction. Article 417 specifies, "At least 90 days before the start of any land-clearing or land disturbing activities, both on and off the site, the Licensee shall file for Commission (FERC) approval a plan to revegetate all disturbed areas with plant species beneficial to wildlife and native to the Project area." FERC also specifies the plan be prepared in consultation with the Corps, U. S. Fish and Wildlife Service (USFWS), the West Virginia Department of Natural Resources (WVDNR), and the Soil Conservation Service (now Natural Resources Conservation Service, NRCS)

Under the No Action Alternative, terrestrial habitat would be expected remain generally unchanged. However, some maturation of existing sparse vegetation would be expected over time.

6.4 Threatened and Endangered Species

Affected Environment

The Endangered Species Act (ESA) of 1973 requires federal agencies to consider the effects of actions on federally listed endangered, threatened, and/or candidate species. The USFWS was consulted for information concerning the presence of such species within the Project Area.

This project is located within the known or historic range of the following endangered species: eastern cougar (*Puma concolor cougar*), Indiana bat (*Myotis sodalis*), the fanshell mussel (*Cyprogenia stegaria*), and the pink mucket pearly mussel (*Lampsilis orbiculata*). Candidate species included the sheepsnose mussel (*Plethobasus cyphus*). The snuffbox mussel (*Epioblsma triuetra*) is considered a species of special concern. The bald eagle (*Haliaeetus leucocephus*) has been delisted from the threatened and endangered species list but remains protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668a-d).

Project Consequences

Based on the location and nature of the project and the absence of suitable habitat within the proposed impact, the Corps has determined the proposed project would have no effect on the eastern cougar or the bald eagle.

The licensee has conducted a mussel survey and provided a copy of the survey report and monitoring plan to the Corps and the USFWS (**Appendix C, Mussel Monitoring Plan**). No federally listed threatened or endangered mussel species were collected during the survey. The Corps has completed a review of this survey and monitoring plan and, in consultation with the USFWS, determined no adverse affects to the above listed mussel species would occur with implementation of the recommended plan. USFWS has concurred with this determination (**Appendix L, USFWS Coordination**).

The applicant has conducted an Indiana bat habitat evaluation. The evaluation indicated potential summer roosting habitat exists along portions of the transmission line. Total potential Indiana bat habitat that would be removed for development of the transmission line will be approximately 13.2 acres. Affects on potential bat habitat would be mitigated by winter tree clearing therefore no adverse effect to the Indiana Bat would occur with the implementation of the recommended plan. USFWS has concurred with this determination and Section 7 Consultation, as required by the ESA, is complete. (**Appendix L, USFWS Coordination**).

6.5 Wetlands and Aquatic Resources

The Federal Water Pollution Control Amendments of 1972 and the Clean Water Act of 1977 (CWA) collectively set regulatory standards on the discharge of various pollutants into surface water resources. These discharges can include untreated or partially treated

wastewater into streams and rivers which can contribute to poor water quality and degrade aquatic resources in a variety of ways. Sections 404 and 401 of the CWA established a permit program to evaluate and regulate discharges into waters of the U. S, including wetlands, to ensure that these discharges do not contribute to the degradation of water quality and aquatic habitat. Further, Executive Order 11990 requires federal agencies to take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out their respective responsibilities.

6.5.1 Wetlands

Affected Environment

The Licensee has conducted field reconnaissance as well as soil, vegetation and hydrology investigations at the Project Site, applying wetland criteria set forth in the 1987 Corps of Engineers Wetland Delineation Manual. The Licensee identified wetlands totaling 6.4 acres within the Project Site. The identified wetlands are shown on the mapping included in **Appendix O, Wetland Mapping**.

The proposed project would impact a total of 0.1 acres of two wetlands: 0.03 acres of Wetland A-1 and 0.07 acres of Wetland A-2. Wetland A-1 is a 0.03-acre is located along the floodplain of Cow Creek. Relatively frequent flooding and/or past clearing has apparently limited the floral diversity of the wetland to an even-aged stand of second-growth silver maple (*Acer saccharinum*), with an under-story of poison ivy (*Toxicodendron radicans*), knotweed (*Polygonum persicaria* and *P. spp.*), and various grasses. Shrubs were generally absent. The matrix color of the underlying silt clay loam was 10YR 4/2 from near surface to greater than 12 inches. Faint or distinct mottles (10YR 5/8) were observed. Wetland hydrology likely derived from frequent over-bank flooding, persistent elevated water table following flood events, and seepage from the open fields and other up-gradient upland areas. Wetland A-2 is a 0.07 acre depressional wetland located near the eastern project boundary. Wetland A-2 is dominated by narrow-leaf cattail (*Typha angustifolia*), fox sedge (*Carex vulpinoidea*), and soft rush (*Juncus effusus*). The soils of this wetland were described as histic epipedon. Hydrology from this wetland is likely derived from precipitation and runoff from adjacent upland areas. The proposed wetland impact areas are shown on mapping included in **Appendix O, Wetland Mapping**.

Project Consequences

Implementation of the proposed project would not result in any impacts to high quality wetlands. The Licensee has proposed to mitigate for the proposed wetland impacts by contributing to the State of West Virginia's in-lieu fee program. In-lieu fee funds are administered by the West Virginia Department of Environmental Protection (WVDEP) to implement stream and wetland creation and enhancement projects that have been approved by the West Virginia Interagency Review Team (WVIRT). The WVIRT is chaired by the USACE, Huntington District, and Regulatory Branch and includes members from the USACE, Pittsburgh District, Regulatory Branch, West Virginia Department of

Environmental Protection (WVDEP), West Virginia Department of Natural Resources (WVDNR), U. S. Fish and Wildlife Service (USFWS), U. S. Environmental Protection Agency (USEPA), and the U. S. Department of Agriculture Natural Resource Conservation Service (NRCS).

Given the size and quality of the wetlands that would be impacted and the mitigation proposed, it has been determined the impacts on wetlands from the proposed project would not be significant.

With the implementation of the No Action alternative, there would be no impact to existing wetlands.

6.5.2 Aquatic Resources

6.5.2.1 Water Quality

Affected Environment

Following the 1948 signing of the Ohio River Valley Water Sanitation Commission (ORSANCO) compact, water quality conditions in the Ohio River began to improve. ORSANCO adopted stream water quality recommendations following the 1965 Federal Water Quality Act. In 1970, ORSANCO Pollution Control Standard I-70 made secondary level treatment the minimum requirement for wastewater treatment plants. As a result, BOD decreased significantly, even as influent loading continued to increase with population increases. Massive federal cost sharing construction grants to local authorities from 1972 to 1995 helped support planning design and construction of wastewater plants to meet minimum treatment requirements. Corresponding to decreasing levels of pollutant loading, DO available in the river to support aquatic life increased substantially (USEPA 2000).

In their Environmental Impact Statement, FERC analyzed the potential cumulative impacts from stacked retrofit hydropower development at navigation dams along the upper 350-mile-long reach of the Ohio River (FERC 1988). The results of FERC model studies demonstrated that there would be substantial declines in dissolved oxygen (DO) concentrations from stacked hydropower projects then licensed or permitted along the upper 150-mile reach of the Ohio River during both low and moderate summer season flow periods. Essentially, this entire reach, which at present generally exceeds the minimum warmwater antidegradation DO criteria, would fail to meet this standard. FERC also coupled a bioenergetics model to their hydraulic/water quality model, which showed a very substantial adverse impact to fish growth in the Ohio River from the losses in DO. Again, this impact was most severe along the upper 150-mile reach of the river. DO concentrations along the longer and deeper pools downstream of Willow Island L&D (RM 161.7) do not appear to be influenced as strongly by operations at the navigation dams, and are generally not as well aerated at low summer flows as the pools in the upper river (USACE 2006).

Project Consequences

Aeration at the Willow Island L&D is not expected to change with the implementation of the proposed project and the Willow Island L&D is not important for maintaining DO for fish and other aquatic organisms as outlined in the FERC License (1989) and Article 408 (**Appendix D, Minimum Flow Release Plan**). In addition, according to Article 402 of the FERC License (1989) agreement water quality will be monitored to maintain a DO concentration of no less than five milligrams per liter (mg/L) downstream throughout the Belleville pool of the Ohio River (**Appendix E, Water Quality Monitoring Plan**). State 401 Water Quality Certification, as required by the Clean Water Act, has been granted on February 24, 2009 Appendix Q, State Water Quality Certification.

6.5.2.2 Fish Community

Affected Environment

The physical and chemical changes in the Ohio River over the years have caused changes to the composition and abundance of the fish community. Changes include the effects of deforestation of the watershed, domestic and industrial wastewater discharges, acid mine drainage, and damming of the river (ORSANCO 2005 and USACE 2006). Species that thrive in impoundments and reproduce with eggs or larvae that float in the water now dominate the fish community, whereas fish that require flowing water and clean gravel substrates have declined. The introduction of non-native species by humans has also contributed to population shifts.

The construction of the high-lift dams by the Corps has affected River connectivity and passage of fish up and down the river (Knights et al. 2003). River connectivity is important for fish movement to spawning areas and overwintering areas, for maintenance of fish community diversity along the River, and for upstream replenishment of mussel populations through movement of the fish that act as hosts for mussel larvae. The high-lift dams are 16 to 37 ft high, and fish are only able to pass upstream by locking through with the barge and boat traffic, by swimming up through gated sections under open river conditions, when the gates have been raised up to allow free-flow of the River and the downstream water level is about equal to the upstream level, or swimming over or around the dams under flood conditions.

Fish community surveys have been conducted by ORSANCO (2006 b) in the Willow Island L&D pool since 1957 and electro-fishing since 1977. From 1957 to 2006, a total of 83 fish taxa representing 14 families have been collected in the Willow Island L&D pool. The two most abundant species collected during these studies include emerald shiner (*Epioblasma triquetra*) and gizzard shad (*Dorosoma cepedianum*). Combined, these two species accounted for 85 percent of the total collection.

Surveys conducted in the Willow Island L&D pool from 1990 to 1993 and 2001 to 2006, yielded a total of 74 fish taxa. The five most abundant species collected during these studies included gizzard shad, emerald shiner, bluegill (*Lepomis macrochirus*), channel shiner (*Notropis wickliffi*), and freshwater drum. Combined, these five species represented 63.2

percent of the fish collected in the Willow Island L&D pool. Fish surveys conducted in the Belleville Pool during 1991 to 1992 and 1999 to 2005 yielded a total of 76 taxa and had the same five most abundant species as those collected from the Willow Island L&D pool surveys: gizzard shad, emerald shiner, bluegill, channel shiner, and freshwater drum. These five species together comprised 62.8 percent of the total fish collections in Belleville Pool. Recreationally important species collected in moderate abundance from both pools included spotted bass (*Micropeterus punctulatus*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), sauger (*Sander Canadensis*), and channel catfish (*Ictalurus punctatus*) (ORSANCO, 2006 b).

In 2006, ORSANCO conducted a biological study of Willow Island L&D pool to determine the overall condition of the Ohio River fish community. This study utilized 13 different metrics to determine the status of fish communities including diversity, abundance, feeding and reproductive guilds, pollution tolerance/intolerance, and fish health (ORSANCO, 2006 b). Fish were collected using electro-fishing at 15 sites randomly selected from RM 126.4 to RM 161.7. These fish surveys yielded a total of 47 species representing ten families. Three fish species collected during the study were listed in Ohio as threatened or of special concern including river redhorse (*Moxostoma carinatum*), river darter (*Percina shumardi*), and channel darter (*Percina copelandi*) (ORSANCO, 2006 b). Overall, results of this study indicated the fish population in the Willow Island L&D Pool was in exceptionally good condition primarily because of habitat conditions and the relatively high abundance of pollution intolerant fish species.

Project Consequences

According to the FERC License (1989) there could be a loss of swift tail-water aquatic habitat from zones below open gates during periods of moderately low flows when the river flow would pass mostly through the turbines, with a shift of such habitat to the turbine tailrace along the left bank. Further, that license and Article 408 (**Appendix D, Minimum Flow Release Plan**) require that bypass flow be maintained for the protection of aquatic habitat.

Finally, according to the FERC License (1989), there could be on the order of zero to ten percent, mortality of fish passing through the turbines with larger game fish passing likely to experience mortalities in the upper end of the referenced range. Susceptibility of resident and locally migrating fish to entrainment at the Project is uncertain. There are no available fish protection and/or guidance systems with proven effectiveness for conditions of the Upper Ohio River Basin and its resident warm-water and cool-water fishes. Fishery losses related to fish entrainment would involve a sequential process to include the following: (1) monitoring of entrainment after operation has begun; (2) compensation to the Ohio Department of Natural Resources' and the West Virginia DNR for measured losses until appropriate site-specific mitigation can be designed and installed; (3) a system-wide cooperative effort among Project developers, in consultation with federal and state fish and wildlife agencies of the region and FERC staff, to develop and test at selected operating sites a series of prototype bioengineering facilities for fish protection and/or guidance; (4) reevaluation of approaches, including installation of fish protection or guidance devices

demonstrated to be effective, continued compensation, or other appropriate mitigation schemes. Articles 404 and 405 (**Appendix F, Fish Mortality and Fish By-Pass**) require AMP's participation in the sequential mitigation process. The FERC License (1989) also requires AMP to design an intake that would allow measurement of fish passage and accommodate possible future installation of fish protection devices at the Project as outlined in Article 404 (**Appendix F, Fish Mortality and Fish By-Pass**).

Impact to fish community is expected to be insignificant given the Licensee adherence to the sequential mitigation process as outlined and required by FERC license Articles 404 and 405.

There no adverse effect to the fish community under the No Action Alternative.

6.5.2.3 Mussel Habitat and Community

Affected Environment

There were an estimated 80 mussel species in the Ohio River 100 years ago (USACE 2006). By the 1950s, that number had dropped to 25 to 35 species owing to a number of factors including acid mine drainage and industrial discharges in the upper reaches, dredging, sand and gravel mining, and impoundment. The impoundment of the Ohio River by navigation dams has essentially eliminated the habitat conditions—free-flowing waters with substrates free of silt and mud—preferred by many freshwater mussels. As part of their life cycles, most freshwater mussel larvae parasitize a host fish, one or more species, which allows for the final biological transformation from larval to juvenile stage. Also, the limited movement of host fish caused by Ohio River impoundments may be another factor contributing to the decline of freshwater mussels in the river.

In 2007, EA Engineering Science and Technology, Inc. conducted mussel surveys in an area spanning approximately 985 ft upstream and 2,625 ft downstream of the Willow Island L&D (EA Engineering, Science, and Technology 2007). A total of 77 mussels representing 12 species were collected during quantitative, semi-quantitative, and qualitative surveys of the area. The three most abundant species collected included flat floater, (*Anodonta suborbiculata*) white heelsplitter (*Lasmiona complanata*), and pink heelsplitter (*Potamilus alatus*), which combined, represented 65 percent of the total collections. No mussels collected were federally listed as threatened or endangered, however, seven species collected (flat floater, plain pocketbook (*Lampsilis cardium*), white heelsplitter, fragile papershell (*Leptodea fragilis*), black sandshell (*Ligumia recta*), washboard (*Megalonias nervosa*), and three-horn mussel (*Obliquaria reflexa*) are considered rare by the WVDNR. These mussels have been relocated to help ensure their survival.

No Adverse effect to mussels is expected from the implementation of the proposed project or from the No Action Alternative.

6.6 Floodplains

Executive Order 11988 requires federal agencies to consider the potential effects of their proposed actions to floodplains. The Project lands are within flood zone AE. Zone AE designates areas within the 100-year floodplain. No new construction or development is allowed unless it is demonstrated that the cumulative effect of the proposed development will not increase the elevation of the 100-year flood more than one foot at any point (MWH, 2007).

Affected Environment

AMP has undertaken a numerical model study of the effect of the Willow Island L&D hydroelectric construction on the upstream water levels during flood events including the 10-year, 50-year, 100-year and 500-year floods. The study includes an evaluation of the upstream water levels with the cofferdam as well as the completed project in place. The study was carried out independently of the physical model studies using the Corps HEC-RAS models of the Ohio River between the downstream Belleville Dam and the upstream end of the Willow Island L&D Pool. The study compares water surface profiles with the cofferdam and project in place to the current regulatory flood profiles included in the FEMA Flood Insurance Studies.

Project Consequences

The results of the studies show the project will have minimal impact (~0.23 ft at the dam and diminishing with distance upstream) on the water levels upstream of the project during construction, with the cofferdam in place. The cofferdam would be removed upon completion of construction. Changes in upstream flood elevations due to the permanent project facilities are projected to be equal to or less than 0.01 foot. . Therefore, construction of the proposed hydropower facility is not likely to adversely affect the 100-year floodplain or floodway.

No significant impact to floodplains would occur with the No Action alternative.

6.7 Prime or Unique Farmland

The Farmland Protection Policy Act (FPPA) requires federal agencies to minimize the conversion of prime or unique farmland to non-agricultural uses.

Affected Environment

The soil survey for Pleasants County indicated that prime farmland soils are present throughout the Project Area.

Construction of the proposed hydropower project would permanently convert 57.6 acres of prime farmland soils to non-agriculture uses, and an additional 28.5 acres of land would be indirectly converted to non-agricultural uses. The FERC EIS did not evaluate potential

impacts to prime or unique farmlands; therefore, the Corps initiated coordination with the NRCS as required by FPPA.

Project Consequences

Conversion of prime farmland soils within the Project Area is not likely to result in a significant loss to the region. Coordination with NRCS confirmed the presence of prime farmland soils within the Project Area, and confirmed that the acreage impacted by the proposed hydropower facility is a very small portion of the total acreage in Pleasants County that has the same value or higher (**Appendix G, Prime Farmland**). Therefore, no significant effect to Prime or Unique Farmland would occur with the proposed action.

There would be no effect to prime farmland with the No Action Alternative.

6.8 Cultural Resources and Historic Properties

Historic property identification efforts at and surrounding the Willow Island Locks and Dam project started in 1973 and have continued through 2010. To aid the Corps in meeting its obligations under NEPA (see especially Section 102(1)B and 40CFR1507.2(b)) and Section 106 of the National Historic Preservation Act of 1966 (U.S.C 470f) and its regulating language 36 CFR 800, historic property identification efforts for the proposed hydroelectric project began in 2008.

These efforts have led to the identification of five historic properties, or properties listed in or eligible for inclusion in the National Register of Historic Places (NRHP), within the defined area of potential effects (APE) for the proposed project. These include: (1) *prehistoric archeological Site 46PL66*; (2) *prehistoric archeological Site 46PL67*; (3) *prehistoric archeological Site 46PL79*; (4) *the Joseph Barker, Jr., Dwelling (Barker House)*; and (5) *the Willow Island Locks and Dam as part of the Ohio River Navigation System*.

The following provides a summary of the potential impacts the proposed alternative action would have on these historic properties. A summary of the pertinent historic property identification efforts within the APE has been provided in **Appendix H, Cultural Resources**.

6.8.1 Analysis of Impacts / Effects to Historic Properties

The following provides an analysis of the potential impacts and effects which would occur to historic properties from the proposed project. Consultation concerning these properties is ongoing and is summarized in section 9.0 **Coordination and Correspondence** of this EA.

Site 46PL66 is a prehistoric site with deposits principally dating from the Late Archaic-period, although a smaller Late Woodland-period component is also known to exist. The site was located beneath a cap of fill from unknown origins in Spoil Area 1. The deep and rapidly deposited alluvium at Site 46PL66 provides a rare opportunity to study and test Late Archaic settlement models in a context where relatively separable occupation periods at one

site are vertically distinguishable (Kelly and Striker 2010). The Corps believes that Site 46PL66 is eligible for inclusion in the National Register of Historic Places (NRHP) under Criterion D, as it contains data that can be used to further test models of Late Archaic period occupation patterns in the Eastern Woodlands.

A portion of the site is located within the footprint of ground disturbing activities associated with the construction of the proposed coffer dam and powerhouse excavation and cannot be feasibly avoided. Therefore, the Corps has concluded that the proposed project will have *an adverse effect to Site 46PL66*, specifically the portions being disturbed for the excavation of the coffer dam and powerhouse. The remainder of the site will remain preserved underneath approximately 10 ft. of additional fill.

AMP's technical consultants, HRA Gray and Pape have designed a data recovery plan to systematically retrieve a vertical sample of the rapidly buried site deposits from a single excavation block measuring approximately 13ft.-x-20 ft. (Pape et.al. 2009). A Memorandum of Agreement (MOA) is being developed among the Corps, AMP, and the West Virginia State Historic Preservation Office (WVSHPO). The MOA requires AMP to mitigate the adverse effect to Site 46PL66 through the data recovery plan prior to the implementation of any ground-disturbing activities as well as timely analysis of data and dissemination of results. The Advisory Council on Historic Preservation (ACHP) has chosen not to participate in the resolution of adverse effects. The Council for West Virginia Archeology (CWVA) and the Ohio Archaeological Council (OAC) have also requested, and been granted, consulting party status.

Site 46PL67 is a moderate-density lithic scatter of unknown temporal or cultural affiliation containing one possible cultural feature, indicating intact subsurface cultural deposits. The Corps believes that Site 46PL79 would qualify for inclusion in the NRHP under Criterion D. Site 46PL67 appears to contain data that can address local or regional research questions relating to topics such as lithic studies, chronology, settlement studies, or subsistence studies (Kelly 2010).

The site is located within the transmission line right-of-way. Transmission poles will not be located within Site 46PL67. The site boundary, and a buffer of 10 m. (32.8 ft.) will be fenced during construction, and no ground disturbing construction activities will occur within the site boundary (Kelly 2010). There will be *no adverse effect* to this resource. Measures to protect Site 46PL67 during construction have been included in the MOA.

Site 46PL79 is a prehistoric site with pockets of intact deposits dating from the Woodland period. The site is located partially within Spoil Area 2. Subsurface investigations revealed a buried cultural horizon, at least one cultural feature, and diagnostic artifacts dating to the Woodland period (Kelly 2010). The Corps believes that Site 46PL79 may contain data that would qualify it for inclusion in the NRHP under Criterion D. The site is assumed to contain data that could address local or regional research questions relating to topics such as lithic studies, chronology, settlement studies, or subsistence studies of the Woodland period occupation patterns in the Eastern Woodlands (Kelly 2010).

Prior to spoiling, existing vegetation will be cleared from the area. Portions of the site with less than 15 cm. (6 in.) of fill will be clearly marked before clearing begins, and all clearing will be done by hand without the use of heavy equipment. Woody vegetation will be cut as close to the ground as possible. The remaining stump and root systems will be left in place. Herbaceous vegetation will be mowed and no grading will be conducted in these areas (Kelly 2010).

Spoil Area 2 will serve as the location of a permanent recreational facility following project completion. This facility will contain a picnic area, restroom, and walkways that will cap half the site under additional layers of fill. Prior to construction of the proposed recreational facilities, up to 4 m. (14 ft.) of fill will be placed in Spoil Area 2. All subsurface disturbances will occur within the fill. Fill will also be placed upon the downriver portion of Site 46PL79 that is not included in Spoil Area 2. In this area, filter fabric will be laid down, and approximately 30 cm. (12 in.) of fill will be placed on top of the filter fabric (Kelly 2010). The filter fabric will serve as a marker for the contractor during construction.

As the site is already buried beneath existing fill ranging from 10 to 110 cm. and additional fill will be placed over the site to further encapsulate it during construction, the Corps has concluded that the proposed Willow Island hydroelectric project will have *no adverse effect to Site 46PL79*. Measures to protect Site 46PL79 during clearing, and preserve the site in place through additional encapsulation, have been included in the MOA.

The Barker House is located on the downstream side of the locks and dam on the right-descending bank of the Ohio River, across from the proposed project. Several of the project features including the powerhouse, spoil pile and transmission line will be in the viewshed of the abandoned building during and following construction. The Barker House is a circa 1828-1832, vernacular five-bay brick I-house with a two-and-a-half story, gabled wood-frame construction extending from the rear of the building. The house is considered eligible for the NRPH under: Criterion A, for its association with early exploration and settlement; under Criterion B for its association with Barker, Jr.; and, under Criterion C as an excellent example of early nineteenth century eclectic architecture (Burden and O'Bannon 2010).

Analysis indicates that trees lining the Ohio River, as well as the Willow Island downstream lock guide wall would partially obscure views from the Barker House of the proposed project features. In addition, it was determined that the Barker House's integrity of setting had already been significantly compromised by the loss of period of significance landscape features (e.g., dependencies, agricultural fields) and by the construction of the Willow Island L&D, Cytex Industries, Inc. chemical plant and Alleghany Energy's Pleasants Power station. Therefore, it was determined that the addition of new visual elements from the proposed project will have *no adverse effect on the Barker House*.

Willow Island Locks and Dam was constructed between 1967 and 1975. The locks and dam include a non-navigable high-lift, gated dam; one main lock; and one auxiliary lock. Willow Island L&D is one of 14 lock and dam facilities constructed as part of the Ohio River Modernization Program (Burden et al. 2009).

The weir located along the left abutment of Willow Island L&D will have to be physically altered by excavation of the bank and the addition of the powerhouse, approach and exit channels. In addition, spoil piles and a transmission line will introduce new visual elements to the facility. A 2001 multiple property National Register nomination form for Ohio River Navigation System recommends that the locks and dams are eligible for the NRHP under Criterion A, for their significant historical role in local, state, and National economic and community development, under Criterion B, for their association with significant historical persons on the local, state, and National level, and under Criterion C for individually notable engineering features and as a complex that shows the evolution of lock and dam technology from the 1920s to the present (Berg 2001).

Since the beginning of the design process, a hydroelectric power generating facility has been considered for the Willow Island Locks and Dam. Recently, as part of the continued evolution of the Ohio River Navigation System, hydroelectric facilities have been added to Greenup and Belleville Locks and Dams, are underway at the Captain Anthony Meldahl Locks and Dams, and further studies are in progress for similar power generating plants at Cannelton, Smithland, and RC Byrd. A preliminary study in 1961 placed a hydroelectric facility at the abutment end of the weir which was proposed on the Ohio (right) descending bank of the river (U.S Army Corps of Engineers, Huntington District 1961). Plans were later revised in 1965 to place the locks on the right descending bank. Therefore, the weir was moved to the West Virginia (left) descending bank of the river (U.S Army Corps of Engineers, Huntington District 1965).

Further, the vista from, or view shed surrounding, the Willow Islands Locks and Dam is not a character defining feature and alternations to this setting by the proposed project will not alter the significance of the locks and dam or the Ohio River Navigation System. Therefore, it is the Corps determination that the addition of the proposed Willow Island Hydroelectric Project will have *no adverse effect on Willow Island Locks and Dam as part of the Ohio River Navigation System*.

The no action alternative would have no impact nor effect to any historic property.

6.9 Hazardous, Toxic, and Radioactive Waste (HTRW)

MWH Americas, Inc. (MWH) was contracted by AMP to conduct the HTRW investigations for the project area to determine if there were environmental concerns that would affect project design and construction. In 2007, MWH conducted a geotechnical investigation in which 27 soil borings were taken to document the physical characteristics of the soil and bedrock in the proposed excavation area. Two phases of environmental investigation were completed in 2007 and 2008 to characterize (screen) the soils that would be excavated and stockpiled during the construction phase. A total of 52 samples were collected (41 soil borings and 10 sediment samples with one instance of 2 samples from same boring) were collected in order to characterize (screen) over 700,000 cubic yards of soil, sediment and rock that would be excavated during construction. These samples were analyzed for VOCs, SVOCs (including PAHs), PCBs, pesticides and inorganic compounds.

Field observations made during boring and sampling activities did not indicate the presence of buried waste. The laboratory analyses of the 52 samples were compared to the West Virginia De minimis criteria for industrial and residential soils. Results of the comparison found that there were no exceedences of the WV De minimis criteria for industrial soil but that there were exceedences of the residential criteria for arsenic (an inorganic compound) and benzo(a)pyrene, (a carcinogenic PAH).

6.9.1 Soil and Sediment

Based on the analytical results of the soil and sediment, MWH developed a Soil Sampling and Management Plan (SSMP) which outlined excavation, transportation, stockpiling and backfilling activities that would be compliant with applicable environmental regulations. The SSMP has been reviewed and approved by WVDEP for the management of soils, sediment and rock during the construction project (refer to Section 3.0 of the SSMP, located in Appendix I). The plan covers not only the following topics, but also details of the investigations, sampling location maps, and includes summary tables of analytical results.

- Materials Distribution Flow Chart for excavating, backfilling and stockpiling soils (shows cubic yardage proposed for stock pile areas (also known as Spoil Areas 1 through 5)).
- As per WVDEP requirement, the basis for conducting sampling of the stockpiled soil to confirm that it meets the WV De minimis criteria (upon completion of “stockpiling / final disposition”).
- Provisions for a final 3-foot cover of soil that meets the residential criteria in areas designated as recreational upon project completion (currently designated as Spoil Area 2).
- Definition of a contingency plan that will be prepared and submitted for WVDEP approval at the time impacted soils are encountered during excavation activities (refer to Section 4.0 of the SSMP, located in Appendix I) .

6.9.2 Groundwater, Stormwater and Surface Run-Off

Currently, Cytec Industries, located adjacent to and southeast of the project site, has a Solid Waste Management Unit (SWMU) identified as GG-3 on the parcel south of Spoil Area 2 (designated as the Recreational Area). In accordance with USEPA Region III requirements, Cytec is investigating this SWMU under the Resource Conservation and Recovery Act (RCRA) Corrective Action Permit #WVD0004341491. They have identified a groundwater impact (plume) and upon completion of the investigations, will be remediating the impact and eliminating future unacceptable risk. However, this will not be remediated prior to construction of the hydropower facility. Therefore during dewatering efforts, the groundwater, surface and storm water run-off will be managed under a National Pollutant Discharge Elimination System (NPDES) permit. The draft permit is scheduled for a 30-day public comment period from 01 September to 01 October 2010. WVDEP has indicated that the final NPDES will be approved sometime during 2010. A copy of the public notice for the NPDES permit is included in **Appendix I, HTRW**.

6.9.3 Regulatory Approval of Proposed Soil Sampling and Management Plan

During the 2007 and 2008 investigations, soil and sediment were found to contain exceedences above residential but below industrial standards per the WV De minimis criteria. Because there were levels above the residential criteria, the soil could not be considered “clean” for backfill use. Therefore, handling, use and final disposition of the soil and sediment would require WVDEP’s approval prior to construction efforts. On August 23, 2010 WVDEP submitted an approval letter to AMP for the SSMP based on the following conditions for excavation, stockpiling and fill activities:

1. The in-situ soil sampling plan and results were deemed sufficient to characterize the soils for the single purpose of excavating and stockpiling the soils and that any soils planned to be excavated outside the currently designated project area must be reported to the WVDEP along with an action plan for how the soils are to be characterized and handled.
2. Upon completion of stockpiling, a confirmation soil sampling plan is to be submitted to and approved by WVDEP. The proposed confirmation soil sampling plan is to be designed to identify any potential presence of previously undisclosed “hot spot” contamination and to otherwise confirm the in-situ soil sample results.
3. The standards to be applied for the management of the excavated soils are in accordance with the Residential and Industrial De minimis Soil Standards set forth in the Voluntary Remediation and Redevelopment Act Rule.
4. Any onsite designated area to be backfilled with soils or offsite designated area where soils will be placed for beneficial fill where it has been demonstrated that the soils meet the Residential De minimis standards using the approved confirmation sampling discussed in item 2 above will require no further action.
5. Any designated area to be backfilled with soils exceeding the residential De minimis Standard but that do not exceed the Industrial De minimis Standard, as demonstrated by the approved confirmation sampling discussed in Item 2 above, can remain in designated areas contingent upon the satisfactory implementation of land use controls. Responsibility for securing the land use controls through the use of the Chapter 22, Article 22 B, Uniform Environmental Covenants Act (UECA), or through the use of enforceable Corp of Engineers 404 permit terms and conditions and/or in the Memorandum of Operations Agreement between the USACE and AMP is the sole responsibility of the AMP. AMP shall also agree to include these restrictions in its Toxic Substances, Testing, Disposal and Monitoring Plan under Article 415 of the Willow Island Hydroelectric Project License (FERC No. 6902) such that upon FERC approval of the Plan, the restrictions will become an integral part of the FERC license for the Willow Island Hydroelectric Project.
6. Any soils that do not meet the Industrial De minimis standard must be clearly identified and managed in accordance with the applicable solid waste or hazardous waste management requirements. The WVDEP is to be notified immediately and prior to any disposal of soils that exceed Industrial De minimis standards.

For clarification, the term “stockpile” used throughout the SSMP is the final disposition/placement area and not the temporary staging as is usually understood by this

term. Due to the limited area of the construction work limits, space is not available to allow for temporary placement of soils, rather the soil would be directly transported to these designated “stockpile” areas for final disposition/placement. Therefore, as mentioned above under item 2, “Upon completion of stockpiling” AMP will submit a confirmation soil sampling plan (for approval by WVDEP) designed to identify any potential presence of previously undisclosed “hot spot” contamination and to otherwise confirm the in-situ soil sample results from the 2007-2008 investigations. During construction, “stockpiling” activities could take over 5 years to complete. Therefore, the WVDEP requires construction of erosion control measures to be put in place on untested soil to control migration of potential industrial soils onto adjacent properties. No liner has been proposed for placement under “stockpile areas” to prevent potential leaching.

Stockpile / Spoil Area 2, which is the proposed recreational area, not only has the groundwater plume issue but also is designated to receive excavated soil with the potential for soil constituents that are above residential standards. Therefore, WVDEP requested that AMP conduct a Human Health Risk Assessment (HHRA) to determine risk associated with the contaminated groundwater as well as contaminated soil (refer to the SSMP for the HHRA, located in Appendix I). WVDEP concurred with the conclusions of the report as long as institutional controls or land use controls are effectively implemented to control unacceptable exposures associated with the recreational facilities:

1. After stockpiled soils from the excavation activities are removed for final disposition and placement, the remaining surface soil which will likely comply with appropriate risk goals without further remediation, will be capped with 3 feet of clean fill. Long term maintenance of the cap is therefore not required for purposes of protecting the receptors.
2. In order to comply with residential target risk goals, a land use covenant or other effective institutional control must be implemented restricting the use of the property to recreational purposes only, as well as a prohibition of the construction of structures for fulltime occupancy.
3. Due to the up-gradient contamination of ground water, a land use covenant or other effective institutional control must be implemented restricting ground water use to monitoring and/or remediation.

WVDEP finalized the letter by stating that “Although the activities proposed for this hydroelectric project do not conveniently fit entirely within any of our existing regulatory programs, we are comfortable that the combination of the requirements set forth in this letter and the NPDES permit are sufficient to protect human health and the environment while providing for a workable scenario for the project to move forward.”

A copy of the WVDEP letter can be found in **Appendix I, HTRW**.

6.9.4 Indemnification Agreement

An Indemnification Agreement between the United States of America and American Municipal Power, Inc. was prepared by USACE and signed by Colonel Robert D. Peterson, District Engineer, Huntington District and Marc S. Gerken, President / CEO, American Municipal Power, Inc. This agreement was necessary to ensure that all responsibilities and liabilities stemming from disturbance of the contaminated soil rest with AMP and not the USACE or any element of the United States Government.

As outlined in the Agreement, AMP shall be responsible for and perform, at its sole expense, any actions related to disturbance of all soil. Such actions include, but are not limited to, actions (such as investigation and response) necessitated by the existence of any and all Hazardous material or any other substances and include those actions required by federal, state or local regulators, including costs of response and disposal in accordance with CERCLA or any applicable law or regulation and include the obtaining of all applicable permits. These actions shall be performed to the satisfaction of the USACE.

Moreover, AMP shall accept any and all responsibility (including but not limited to the signing of manifests required by law and/or regulation) for the material generated as a result of the disturbance of soil. A copy of the signed Indemnification Agreement can be found in **Appendix I, HTRW**.

6.9.5 Environmental Covenants / Deed Restrictions

The project area contains five stockpile/spoil areas designated to receive excavated soil with potential contaminants above the Residential WV De minimis criteria. Stockpile / Spoil Areas 1 and 2 are owned by USACE. Stockpile/Spoil Areas 3, 4 and 5 are privately owned. As mentioned in the WVDEP approval letter, deed restrictions / environmental covenants are required on properties where stockpiled soil exceeding the residential criteria will remain.

AMP has entered into contracts with the private landowners stating that the landowners will execute the land use covenant and deed containing restrictions. WVDEP provided an Environmental Covenant template to AMP who in turn worked with the landowner to obtain signature and final approval by WVDEP. The environmental covenants prohibit activities on or uses of these properties to avoid excessive human exposure to described contaminants. Those prohibited activities and uses include, but are not limited to: Residential use as defined in West Virginia Code Chapter 22, Article 22. AMP will conduct inspections of the properties to monitor compliance with the Environmental Covenants at least once per year, and shall submit two (2) signed copies of the inspection monitoring report to the WVDEP within thirty (30) days of the inspection. Copies of the signed Environmental Covenants are included in Appendix I, HTRW. Similar restrictions will be included on Federal Property managed by the Corps and included in the project operations and maintenance manual and master plans.

With strict adherence to required restrictions, conditions, mandatory testing and development of contingency plans, if needed, to address potential future issues resulting from final placement of materials as specified by the WVDEP, no significant risk to human health and the environment is expected from the proposed project.

6.10 Air Quality

The Clean Air Act (CAA) allows the U.S. Environmental Protection Agency (EPA) to set air quality standards for pollutants considered harmful to public health and welfare. The National Ambient Air Quality Standards (NAAQS) set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. These standards have been established for six criteria pollutants including carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), and sulfur dioxide (SO₂), and each state is required to develop implementation plans for each pollutant. Areas are generally in “attainment” of the standards for the pollutants listed above or in “nonattainment”. Nonattainment areas are required by the CAA to comply with the NAAQS standards through the evaluation and development of a maintenance plan. The EPA makes a conformity determination to assure that the actions within the maintenance plan would conform to the respective state’s implementation plan for each nonattainment pollutant.

According to the West Virginia Department of Environmental Protection, Division of Air Quality website (<http://www.wvdep.org/>) and the EPA’s Green Book (2008), Pleasants County is considered “In Attainment” for all the NAAQS criteria pollutants. While the operation of the proposed hydropower facility would not result in significant impacts to air quality, construction of the powerhouse, channel excavation, and site grading would have the potential to cause localized and temporary, nuisance air quality impacts, particularly those associated with diesel fuel fumes and construction equipment exhaust. The proposed project would not require 24-hour construction and periods of equipment downtime would allow for the dispersion of the nuisance fumes generated during construction operations. The proposed action is exempted by 40 CFR Part 93.153 from making a conformity determination since estimated emissions would not exceed de minimis levels or direct emission of a criteria pollutant or its precursors.

No significant adverse effect to Air Quality is expected from the construction or long term operation of the proposed project.

6.11 Noise

Corps personnel determined during a November 5, 2009 field visit that the Project Area is a typical rural area where ambient noise levels are relatively low with noise increases from local car and truck traffic, as well as the operation of farm and lawn maintenance equipment. Noise is measured in “Weighted” decibels or dBA, and the baseline noise for the Project Area is around 56 dBA (EPA, 1978). The proposed hydropower plant machinery will be situated deep inside a reinforced concrete superstructure. The walls of the superstructure would muffle nearly all, if not all of the noise produced by the machinery operating inside.

Moreover, as no additional flows would be released through the hydropower facility beyond that which is released through the existing dam, operation of the hydropower plant is expected to have no significant increases in ambient noise levels.

Construction of the proposed hydropower facility would temporarily increase ambient noise levels due to the operation of construction equipment; however, the increases in ambient noise levels will be localized to the specific construction area. The minimum equipment required for project construction include diesel backhoes, diesel front end loaders, dump trucks, a concrete mix truck, and a crane. The noise generated from this type of equipment ranges from 80 and 85 dBA, measured from a distance of 50 feet (EPA, 1971). If all six pieces of equipment were operated at the same time, the maximum total noise generated would be 91 dBA (EPA, 1978).

Construction equipment would likely be operated for up to twelve hours per day, and during the daytime hours, and the duration of construction would likely last 24-30 months. The Project Area is relatively flat or rolling, and is surrounded by woodlots, and forested mountains that would intercept noise generated by construction equipment. Therefore, the analysis presents the most conservative estimate of ambient noise increases during construction. Due to the intermittent nature of construction as well as the buffering effect from topography, no significant noise impacts from project construction or long-term project operation is expected.

No temporary construction related increases in noise would occur under the No Action Alternative. Existing ambient noise such as local car and truck traffic, as well as the operation of farm and lawn maintenance equipment would continue.

6.12 Transportation

As described in previous sections, the Project Area is generally a rural agricultural area, although it is adjacent to a large industrial facility. The region is served by Interstate 77, and locally by State Route 2. State Route 2 carries traffic to and from the local communities of Willow Island, Eureka, Belmont, and St. Marys to the east northeast and Waverly, Williamstown, Marietta, Vienna, and Parkersburg to the west southwest. The operation of the hydropower plant would not disrupt normal traffic patterns; however, construction may result in slight delays when equipment and materials are mobilized to and from the Project Area, and/or when excess excavation material is mobilized offsite. Flagmen would be used to maintain traffic along these routes when used during construction, and any traffic delays would be localized and short in duration.

No impact to transportation and traffic would occur under the No Action alternative.

6.13 Recreation and Aesthetics

Four public access sites are located in the vicinity of the Willow Island Dam. The St. Marys Boat Launch is located about 5 miles upstream of the dam on the left (West Virginia) bank. An unnamed boat launch is located in the town of Maplewood on the left bank. Two additional recreational facilities are operated and maintained by the USACE at the Willow Island L&D. A group picnic shelter is located at Willow Island L&D, on the right (Ohio) bank. Although no developed facilities are present, the left abutment of the dam is a popular bank fishing site. Photographs of this area are contained in **Appendix J, Recreation Plan**.

Development of the Project would have no effect on the St. Marys Boat Launch, Maplewood Boat Launch, or Willow Island L&D recreational facilities. Development of the cofferdam and permanent Project features would require displacing those that engage in bank fishing in the vicinity of the dam. However, these individuals could engage in bank fishing further downstream as well as utilize the temporary recreation facilities to be developed as part of the Project.

The Corps concurred that the Recreation Plan required by Article 407 of the FERC License (1989) would offset potential impacts (**Appendix J, Recreation Plan**) which include: (1) provide a recreation plan for providing fishing access during construction; (2) use hydraulic modeling to design all permanent and temporary in-river fishing access facilities; (3) complete construction of all permanent recreational facilities prior to or concurrent with the date of start-up of project operation; (4) provide a plan for maintaining flow velocities in the vicinity of the tailrace fishing areas during times when the power plant is inoperative.

Existing recreational opportunities at the project site would remain the same with the implementation of the No Action alternative.

7.0 CUMULATIVE EFFECTS

Cumulative effects are “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 actions”. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR Part 1508.7 Council on Environmental Quality [CEQ] Regulations). This analysis followed the guidance provided by CEQ under the title “Considering Cumulative Effects under the National Environmental Policy Act”, dated January 1997.

An inherent part of the cumulative effects analysis is the uncertainty surrounding actions that have not yet been fully developed. The CEQ regulations provide for the inclusion of uncertainties in the analysis and states that “when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment...and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking” (40 CFR 1502.22). The CEQ regulations do not state that the analysis cannot be performed if the information is lacking.

A review was conducted to determine which, if any, resources could be incrementally affected by this project. Based on that review, water quality and fishery resources were identified for consideration of potential cumulative effects by the proposed project in combination with other past, present, and foreseeable future activities. In addition, a Cumulative Effects Assessment that addressed mainstem issues was recently completed for the Ohio River Mainstem System Study (ORMSS CEA). That study identified riparian and mussel resources as the two resources that are marginally sustainable. As a result, these two resources were also given consideration. However, since the land area to be affected by the project is small and has already been impacted by the dam construction, there would be virtually no incremental impact to the riparian resources so detailed assessment was not necessary.

Since the three resources considered are aquatic, they all share common spatial boundaries for this assessment. This spatial boundary was set at the limits of the upper and lower pools. The upper pool limit is set at Hannibal Lock and Dam which begins at River Mile 120.4. The lower pool limit is established by Belleville Lock and Dam at River Mile 203.9. The time boundaries for this assessment will begin when the high-lift dams were constructed in the mid-1960's to early 1970's and end ten years after the completion of the hydropower facility.

Historically, DO levels along the Ohio River were depressed by the biochemical oxygen demand (BOD) of raw or insufficiently treated sewage discharges. Following 1948 advances in cooperative management which included signing of the ORSANCO compact, water quality conditions in the Ohio River began to improve. Following the 1965 Federal Water Quality Act, ORSANCO adopted stream water quality recommendations. In 1970, ORSANCO Pollution Control Standard I-70 made secondary level treatment the minimum requirement for wastewater treatment plants. As a result, BOD effluent loading decreased significantly, even as influent loading continued to increase with population increases. Massive Federal cost sharing construction grants to local authorities from 1972 to 1995 helped support planning design and construction of wastewater plants to meet minimum treatment requirements. Corresponding to decreasing levels of pollutant loading, DO available in the river to support aquatic life increased substantially. Given the close connection between water quality, mussels and fish, these same past actions also applied to these other two resources.

Reasonably Foreseeable Future Actions were identified river-wide in the ORMSS CEA. They included 87 specific actions that fell into five major groupings. Those groupings include Navigation Investment Actions such as construction and rehabilitation of lock and dams; Other Corps Activities such as dredging, bank stabilization and ecosystem restoration activities; 'But For' Actions that wouldn't occur but for the presence of the navigation structures and include commercial ports, industrial facilities and hydroelectric plants; Actions by Others which includes a plethora of private development including point and non-point discharges; and Regulatory Actions that consists of laws and programs designed to protect environmental resources. This latter group of laws and regulatory actions has had the greatest effect on the resources of concern during the last 40 years.

Hydropower turbines can cause mortality to fish that pass through the facility. In addition, lower DO can affect fisheries and mussels. Dissolved oxygen may be affected due to diversion of River flows through a hydropower facility that would otherwise be passed over the dam, thus increasing aeration of the water. Dissolved oxygen levels are also affected by nutrient and temperature loads contributed from municipal and industrial discharges. Fish that move long distances in the Ohio River could pass more than one hydroelectric facility, where they could be subject to cumulative entrainment injury or mortality.

The proposed hydropower facility would use low-head, low velocity turbines. Direct effects on fish from entrainment at the proposed facility were not considered significant. Further, in scoping potential effects on fishery resources, mortality from fish passage and entrainment through the turbines would not be expected to be cumulative from other Ohio River hydropower facilities due to the long reaches between pools and relatively low potential for relationship among populations.

The ORSANCO has “adopted a policy on hydropower development at Ohio River dams which calls for each developer to conduct studies to determine the level of aeration provided by the dam prior to hydropower construction, to provide capabilities in facility design and operation to replace the aeration capacity when needed to maintain stream DO levels, and continuous monitoring of DO levels above and below the facility, with results made available to ORSANCO through telemetry in order to allow real time response to adverse conditions. The Federal Energy Regulatory Commission has cooperated by placing conditions in new licenses for Ohio River hydropower projects that call for ORSANCO review of facility monitoring plans.” Although the proposed project would be expected to result in some reduction of DO from having water redirected through the turbines instead of over the dam, this would be minor given that AMP has committed to maintaining DO levels downstream of the lock and dam that are at least as high as would occur in the absence of the proposed project, unless this practice conflicts with flow releases that are required by the Corps’ operations. Moreover, these effects would be proximate to the dam and therefore the geographic boundary of analyses is relatively small.

In conclusion, in scoping cumulative effects issues no resources were identified as having a potential to be significantly affected by the proposed project in combination with other past, present and reasonably foreseeable future actions.

8.0 ENVIRONMENTAL REQUIREMENTS AND PROTECTION STATUTES

Throughout the development of the proposed hydropower facility at Willow Island L&D, the Corps has been coordinating with the Licensee, as well as federal and state resource agencies to ensure the proposed hydropower project does not adversely impact the human environment or the structure or operation of the Project. The resulting NEPA document presents the Corps analysis of the potential impacts from the proposed project in compliance with the following federal, state, and local statutes listed in the table below.

Table 1. Environmental Requirements and Protection Statutes

<i>Federal Statutes</i>	<i>Status*</i>	<i>Location of Discussion</i>
Bald and Golden Eagle Protection Act, 16 U.S.C. 668-668(c).	Full Compliance (FC)	Section 6.4
Clean Air Act, As amended, 42 U.S.C. 7401, <u>et. seq.</u>	FC	Section 6.10
Clean Water Act (Federal Water Pollution Control Act), As amended, 33 U.S.C. 1251, <u>et seq.</u>	FC ¹	Section 6.5
Endangered Species Act, As amended, 16 U.S.C. 1531 et seq.	FC	Section 6.4
Farmland Protection Policy Act, PL 97-98, 7 CFR 658	FC	Section 6.7
Federal Water Project Recreation Act, As amended, 16 U.S.C 460, et seq.	NA (Not Applicable)	NA
Fish and Wildlife Coordination Act, As amended, 16 U.S.C. 661 et seq.	FC	Section 6.4
Land and Water Conservation Fund Act, As amended, 42 U.S.C. 4601-4601-11, et. seq.	NA	NA
National Environmental Policy Act, As amended 42 U.S.C. 4321, et. seq.	FC	Sections 1 thru 10
National Historic Preservation Act, As amended 16 U.S.C. 470a, et seq.	FC ²	Section 6.8

Rivers and Harbors Act, 33 U.S.C. 401, et seq. Rivers and Harbors Act, 33 U.S.C. 403, et seq. Rivers and Harbors Act, 33 U.S.C. 408, et seq.	NA FC ³ FC ⁴	Sections 1 thru 10
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Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	NA	NA
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Wild and Scenic Rivers Act, As amended, 16 U.S.C. 1271, et seq.	NA	NA
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Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601, et seq.	FC	Section 6.9
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<i>Executive Orders</i>	<i>Status</i>	<i>Location of Discussion</i>
Floodplain Management (E.O. 11988)	FC	Section 6.6
Protection of Wetlands (E.O. 11990)	FC	Section 6.5.1
Environmental Justice (E.O. 12898)	FC	Section 6.2
<i>State, local and USACE Policy</i>	<i>Status</i>	<i>Location of Discussion</i>
Hazardous, Toxic and Radioactive Waste (HTRW) Guidance, ER 1165-2-132	FC	Section 6.9

**Notes regarding Status*

1. Construction of the proposed hydropower project will require the authorization under Section 404. The Corps is currently reviewing the Licensee’s application. The licensee must obtain the required Section 404 authorization before project construction can commence. For additional information see Sections 2.3 and 6.5 and Appendix K for the Public Notice.

2. Five historic properties have been defined within the area of potential effects (APE) for the proposed project; (1) prehistoric archeological Site 46PL66; (2) prehistoric archeological Site 46PL67; (3) prehistoric archeological Site 46PL79; (4) the Barker House; and (5) the Willow Island Locks and Dam as part of the Ohio River Navigation System. The Corps has determined the proposed project will have no adverse effect to prehistoric archaeological Sites 46PL67 and 46PL79, the Barker House, or the Willow Island Locks and Dam as part of the Ohio River Navigation System. However, the proposed project will have an adverse effect to archeological Site 46PL66. The Corps will work with consulting parties to resolve adverse effects through the execution a MOA as the site cannot be feasibly avoided. The MOA will require the execution of an agreed upon data recovery plan to systematically retrieve, analyze a sample of significant data from the site, and disseminate the results of that excavation. The MOA will also address adverse effect avoidance measures associated with Sites 46PL67 and 46PL79. As a MOA has not yet been executed, a letter from AMP committing to doing whatever is necessary to identify historic properties, and avoiding or

resolving adverse effects to historic properties from the proposed project, is attached in Appendix H, Cultural Resources. Final decisions regarding the 404 CWA and section 10 RHA application cannot be made until an MOA is executed and/or the Corps responsibilities under U.S.C 470(f) and its regulating language 36 CFR 800 have been completed. The data recovery plan will not be allowed to proceed until the required authorizations have been obtained.

3. Construction of the proposed hydropower project will require authorization under Section 10 RHA. The Corps is currently reviewing the Licensee's application. The Licensee must obtain the required Section 10 authorization before project construction can commence. For additional information see Sections 2.3 and 6.5 and Appendix K for the Public Notice.

4. Construction of the proposed hydropower project will require approval from the Chief of Engineers. This Environmental Assessment evaluates the potential impact of the proposed hydropower project on the human, natural, and cultural environment, and the evaluation of the project's potential impact on the Corps Willow Island project is provided in the Section 408 Decision Document.

9.0 COORDINATION AND CORRESPONDENCE

Coordination with federal, state, and local agencies has been initiated and conducted throughout the course of the project. USFWS consultation for this project was initiated by FERC, and as required by the FERC License, AMP has continued coordination with respect to Endangered Species Act (ESA) compliance issues. During the preparation of this NEPA document, the Corps followed up with the USFWS regarding ESA and FWCA compliance. Terrestrial habitat, freshwater mussel, and Indiana bat studies conducted by the Licensee has provided the required information to determine that there are no federally threatened or endangered species within the Project Area; therefore, ESA Section 7 consultation process is complete. (**Appendix L, USFWS Coordination**)

Public Notices (NO.LRH 2008-00-293-OHR and NO.LRH 2008-00-293-OHR-1), as well as additional efforts to coordinate with Indian Tribes, WVSHPO, OHPO, other potential consulting parties, and the public, have been undertaken by the Corps between 2008 and 2010 as per 36 CFR 800.2(a)(4). As a result of these efforts, the CWVA and the OAC have requested, and been granted, consulting party status under 36 CFR 800.2(c)(5) (**Appendix H, Cultural Resources**). Additional parties have expressed interest in the proposed project, but have not requested consulting party status.

Initial historic property identification efforts, a draft data recovery plan, and a draft Memorandum of Agreement (MOA) have been developed by AMP at the request of the Corps. Based on these efforts the Corps has determined that in accordance with 36 CFR 800.5(b) the proposed project will have no adverse effect to the Barker House, or the Willow Island Locks and Dam as part of the as part of the Ohio River Navigation System. However, in accordance with 800.5(d)(2) it is the Corps' finding that the proposed undertaking will have an adverse effect to prehistoric archeological Site 46PL66 located in West Virginia. These efforts were initially submitted to the ACHP, WVSHPO, OHPO, CWVA, and the

Delaware Nation. Responses were received from the ACHP, WVSHPO and OHPO. ACHP stated that it does not wish to participate in resolving adverse effects. WVSHPO requested additional information on one prehistoric archeological site (46PL35), the Willow Island Locks and Dam, and two standing structures (7847 and 7853), but concurred with the adverse effects determination for Site 46PL66, the proposed data recovery plan, and the draft MOA. OHPO concurred with the no adverse effect determination to the Joseph Barker, Jr., Dwelling (Barker House) and deferred to the WVSHPO regarding the eligibility of the Willow Island Locks and Dam.

Additional historic property identification efforts associated with spoil areas and temporary docking facility identified two additional historic properties, prehistoric archeological Sites 46PL67 and 46PL79. Based on these efforts the Corps has determined that in accordance with 36 CFR 800.5(b) the proposed project will have no adverse effect to Sites 46PL67 and 46PL79. Copies of all historic property identification studies prepared for this identification effort, and the draft EA, are being provided to the ACHP, WVSHPO, OHPO, CWVA, the Delaware Nation, the Oneida Indian Nation, and OAC as continuing consultation concerning adverse effects to historic properties. OAC also requested initial historic property identification efforts.

As Site 46PL66 cannot be feasibly avoided, it is anticipated that adverse effects to site 46PL66 can be resolved through the execution of a MOA as described in 36 CFR 800.6(c) among the Corps, AMP and the WVSHPO. The MOA will also address adverse effect avoidance measures associated with Sites 46PL67 and 46PL79.

As a MOA has not yet been executed, a letter from AMP committing to doing whatever is necessary to identify historic properties, and avoiding or resolving adverse effects to historic properties that will occur from the proposed project, is attached in **Appendix H, Cultural Resources**. Final Section 404 CWA and Section 10 RHA decisions cannot not be made for the proposed project until an MOA is executed and/or the Corps responsibilities under U.S.C 470(f) and its regulating language 36 CFR 800 have been completed. The data recovery plan will not be allowed to proceed until these permits are issued.

With respect to potential impacts to prime and unique farmland, as required under the Farmland Protection Policy Act (FPPA), coordination with the NRCS has been initiated and completed (**Appendix G, Prime Farmland**). Prime farmland encompasses most of the Project Area, and construction of the proposed hydropower facility would permanently convert prime farmland to non-agricultural uses. However, conversion of these soils is not likely to result in a significant loss to the region, and because the impacts are confined to the Project Area, the project is not likely to result in indirect and cumulative permanent conversion of adjacent prime farmland soils.

As described in Section 7.5 and Section 9.0, a joint Public Notice (PN) was issued for the Corps CWA and RHA regulatory actions, as well as the public review period for the Corps Section 408 Draft Environmental Assessment (DEA). The DEA distribution list is provided in Section 13.0. Throughout the licensing process, FERC and the Licensee have been initiating consultation with West Virginia agencies. Therefore, the Corps identified those

agencies that have shown an interest in the project during the FERC licensing process, and sent the DEA directly to those agencies.

10.0 SUMMARY AND CONCLUSION

The Corps has taken reasonable measures to assemble and present the known or foreseeable environmental impacts of the proposed Willow Island hydropower facility in this EA. This EA presents the results of the analysis of the Corps evaluation of the proposed project, and has been prepared to support the Chief of Engineer’s decision to allow or not allow alteration and modification of the Willow Island Locks and Dam project as required by 33 USC 408 as well as to support regulatory decision-making under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act. More detailed information regarding specific elements of the Corps Section 408 review can be found in the Section 408 Decision Document.

Impacts to the environment have been determined to be insignificant or may be successfully mitigated by measures proposed by the Licensee in plans prepared as required by the FERC License, as well as mitigation requirements mandated by the Corps. Therefore, no significant impacts to the human environment would occur as a result of implementation of the proposed action, and a mitigation summary is provided in the **table below**.

Table 2. . Mitigation Summary			
Resource	Proposed Mitigation	Agency	Status
HTRW (Soil, Sediment, Surface and Groundwater)	Construct project IAW WVDEP-Approved Soil Sampling and Management Plan (SSMP), NPDES Permit & FERC-Approved Toxic Substances, Testing, Disposal and Monitoring Plan (Article 415)	FERC	Partially Complete – The WVDEP-Approved SSMP & NPDES Permit are in the Appendix I, the Toxic Substance, Testing, Disposal and Monitoring Plan has yet to be prepared and approved by FERC.
Water Quality and Aquatic Species	Implement a monitoring plan to ensure that dissolved oxygen levels meet a minimum daily average of 5.0 mg/L (Articles 402)	FERC	Complete (Appendix E)
Fish and Aquatic Species	Operate project in a run-of-river mode to maintain natural flow conditions and implement a monitoring plan (Articles 404 and 405)	FERC	Complete (Appendix F)
Freshwater Mussels	Conduct freshwater mussel surveys and develop a protection plan (Article 412)	Corps	Complete. No federally listed species were identified within the project area (Appendix C).
Wetlands	Develop a mitigation plan to offset the unavoidable impact to wetlands (CWA Section 404 and 401 Permit).	Corps	Complete (Appendix O)

Recreation	Develop a recreation plan to replace and improve recreation opportunities at the Willow Island Project (Article 407).	FERC	Complete (Appendix J).
Aesthetics	Visual Resources Plan (Article 413)	FERC	Complete (Appendix N)
Archeological Site 46PL66	Execute an MOA as described in 36 CFR 800.6(c) requiring the implementation of an approved data recovery plan that will systematically retrieve and analyze a sample of significant data from 46PL66 prior to the implementation of any ground-disturbing activities.	Corps	The draft MOA is currently being negotiated among signatories and consulting parties. The MOA will have to be executed and/or the Corps responsibilities under U.S.C. 470(f) will be required for the issuance of a CWA individual 404 permit and RHA Section 10 permit. Both permits will be achieved prior to implementing the data recovery plan.

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13.0 ACRONYM GLOSSARY

APE – Area of Potential Effect

BMP – Best Management Practices

CAA – Clean Air Act

CEQ – Council of Environmental Quality

CFR – Code of Federal Regulations

CWA – Clean Water Act

dB(A) – “A-weighted” decibel

DAPC – Ohio Environmental Protection Agency, Division of Air Pollution Control

EA – Environmental Assessment

EO – Executive Order

EPA – United States Environmental Protection Agency

ER – Engineering Regulation

ESA – Endangered Species Act

FEMA – Federal Emergency Management Agency

FIRM – Flood Insurance Rate Maps

FPPA – Farmland Protection Policy Act

FWCA – Fish and Wildlife Coordination Act

HDD – Horizontal Directional Drilling

HTRW – Hazardous, Toxic and Radioactive Waste

NAAQS – National Ambient Air Quality Standards

NEPA – National Environmental Policy Act

NHPA – National Historic Preservation Act

13.0 ACRONYM GLOSSARY CONTINUED

NPDES – National Pollutant Discharge Elimination System

NRCS – Natural Resource Conservation Service

NRHP – National Register of Historic Places

NWI – National Wetlands Inventory

OAI – Ohio Archeological Inventory

ODNR – Ohio Department of Natural Resources

OEPA – Ohio Environmental Protection Agency

OHI – Ohio Historic Inventory

OHPO – Ohio Historic Preservation Office

OWI – Ohio Wetlands Inventory

PAA – Proposed Action Alternative

PTI – Permit to Install

RCRA – Resource Conservation and Recovery Act

SR – State Route

USACE – United States Army Corps of Engineers

USFWS – United States Fish and Wildlife Service

WRDA – Water Resources Development Act