



Draft Environmental Assessment

Armory Area Stormwater Detention Basin

City of Oshkosh, Wisconsin
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List of Acronyms

APE	Area of Potential Effect
BMP	Best Management Practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic feet per second
Chapter 30 Permit:	State of Wisconsin permit required for certain projects affecting waterways and wetlands
CO	Carbon monoxide
CWA	Clean Water Act
dB	Decibels
DO	Dissolved Oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHBM	Flood Hazard Boundary Map
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
H&H	Hydrology & Hydraulics
HMGP	Hazard Mitigation Grant Program
KnB	Kewaunee Silt Loam
LUST	Leaking underground storage tank
MaA	Manawa Silty Clay Loam
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NO ₂	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NREPA	Natural Resources and Environmental Protection Act
NRHP	National Register of Historic Places
OmB	Omro Clay Loam
OAQPS	Office of Air Quality Planning and Standards
OSHA	Occupational Safety and Health Administration
Pb	Lead
P.L.	Public Law
PM ₁₀	Particulate matter
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
ROW	Right-of-way
SHPO	State Historical Preservation Office
SHWS	State Hazardous Waste Site
SO ₂	Sulfur Dioxide
SWA	Solid Waste Act
THPO	Tribal Historic Preservation Office

TSCA	Toxic Substances Control Act
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Department of the Interior Fish and Wildlife Service
USGS	United States Geological Survey
USH	United States Highway
UST	Underground Storage Tank
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollutant Discharge Elimination System

1.0 Introduction

1.1 Project Authority

The City of Oshkosh (City) applied to the Federal Emergency Management Agency (FEMA) for assistance with a Pre-Disaster Mitigation (PDM) project under application number PDMC-PJ-05-WI-2011-009. The PDM Program is authorized by Section 203 of the Stafford Act, 42 U.S.C. 5133. The PDM program is designed to assist States, Territories, Indian Tribal governments, and local communities to implement a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on federal funding from future disasters.

On February 2, 2012, the PDM grant assistance was transferred to Section 404 Hazard Mitigation Grant Program (HMGP) because of funding considerations. Thus, the project is now proposed to be funded under the HMGP with an Application number of: 1933.35-R.

In accordance with 44 Code of Federal Regulations (CFR) for FEMA, Subpart B, Agency Implementing Procedures, Part 10.9, an Environmental Assessment (EA) is being prepared pursuant to Section 102 of the National Environmental Policy Act (NEPA) of 1969, as implemented by the regulations promulgated by the President's Council on Environmental Quality (CEQ; 40 CFR Parts 1500-1508). The purpose of the EA is to analyze the potential environmental impacts of the proposed project, and to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

1.2 Project Location

The proposed Armory Area Stormwater Detention Basin project is located in the City of Oshkosh, Wisconsin, within Winnebago County. The City of Oshkosh has a population of approximately 64,000 and is located approximately 90 miles northeast of Milwaukee, Wisconsin and 50 miles southwest of Green Bay, Wisconsin.

Within the City, the Armory Area Stormwater Detention Basin site is located on the south side of Oshkosh, just east of USH 41. The project will be located on two existing parcels located at 1415 Armory Place and 1530 South Koeller Street, City of Oshkosh, Wisconsin, 54902. A regional location map is included as Figure 1, and a site location map is included as Figure 2.

1.3 Purpose and Need

The objectives of FEMA's HMGP program are to provide assistance to the community because of a previous disaster. This funding can be used in the implementation of mitigation projects before future disasters, and to reduce the reliance on Federal funding from potential future disaster declarations. The purpose of the alternatives presented in this EA is to reduce damage to public and private property that results from flooding. The need for the project is to reduce flooding in the areas surrounding the proposed Armory Area Stormwater Detention Basin.

The proposed project is located within the Campbell Creek watershed. The Campbell Creek watershed has historically experienced flooding during periods of moderate to heavy rainfall. Because of limitations in the stormwater conveyance system, short, intense rains, and longer, less intense rains can both result in extensive flooding within the watershed. Flooding includes localized street flooding and flooding of residential and non-residential buildings resulting in property damage. Significant flooding is known to have occurred within the City of Oshkosh in 1982, 1986, 1990, 1993, 1996, 1999, 2000, 2001, 2004, 2008, and 2010. The flooding

included streets, basements, and structure flooding. Extensive hydrologic and hydraulic modeling was conducted to evaluate the Campbell Creek watershed. The modeling, along with actual measurements during past flood events, showed peak water surface elevations of one to four feet above the ground surface commonly occurred in the flood-prone areas. These flood depths result in severe property damage to homes and other buildings. In addition to these direct impacts, there are indirect impacts on transportation networks, interference with business and commerce, as well as health and safety impacts.

In accordance with federal laws and FEMA regulations, the EA process for a proposed federal action must include an evaluation of alternatives and a discussion of the potential environmental impacts. This EA was prepared in accordance with FEMA's regulations as required under NEPA. As part of this NEPA review, the requirements of other environmental laws and executive orders are also addressed.

2.0 Alternative Analysis

2.1 Alternative 1 – No Action Alternative

No action would be taken to reduce the damages caused by flooding within the lower portion of the Campbell Creek watershed. Flooding would continue to impact private homes and property, and roads. Flooding would also continue to present risks to human health and safety.

2.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

This alternative includes the construction of the Armory Area Stormwater Detention Basin. The Armory Area Stormwater Detention Basin would be located on portions of two parcels (1415 Armory Place and 1530 South Koeller Street) within the City of Oshkosh (City). The majority of the project area is undeveloped land adjacent to the Wisconsin National Guard Armory. This area is grassed with areas of trees and brush. An existing drainage-way runs along the northwest side of the property. The remaining portion of the project would be constructed on vacant, commercial land. The commercial land contains two unoccupied buildings and a pavement parking/storage area. The total project area is approximately 18 acres.

The construction of the Armory Area Stormwater Detention Basin includes the elements described below. A conceptual design drawing of the proposed basin is attached (Figure 3).

1. Construction of a detention basin to provide approximately 80 acre-feet of flood storage. The detention basin would be constructed on parts of two existing parcels and have a total footprint of approximately 13.4 acres and a maximum depth ranging between approximately 7 – 18 feet below current ground surface. Approximately 224,000 cubic yards of earthen material will be excavated to construct the detention basin. There will be a minimum ten-foot wide boundary around the basin to allow vehicle access for maintenance purposes. This allows the City access to the outlet structure, emergency spillway, and the detention basin side slopes for inspections and maintenance work. Access to the site for maintenance will be provided from Menard Drive. The slopes surrounding the basin will be at a maximum of a 4:1 slope. A permanent pool will be incorporated into the bottom of the basin to maximize storage volume within the basin.
2. Restoration of disturbed areas. Restoration to include wetland planting around shallow areas of the detention basin, native prairie plantings on the detention basin side slopes, and turf grass plantings around the detention basin to blend the site into the surrounding properties.
3. Construction of a diversion structure and 48-inch x 76-inch horizontal elliptical storm sewer. The structure will divert stormwater runoff into the proposed Armory Area Stormwater Detention Basin. The junction structure will be located just west of the detention basin and will divert runoff from upstream storm sewers into the proposed 48-inch x 76-inch storm sewer constructed to discharge into the Armory Area Stormwater Detention Basin. Stormwater enters the basin through one main sewer and two smaller separate storm sewers.
4. Construction of a detention basin outlet structure. The outlet structure from the proposed detention basin discharges stormwater runoff at rates low enough to reduce downstream flooding. The outlet structure from the detention basin includes a 12-inch pipe at an invert elevation of 760.00 entering a concrete box structure. A 48-inch pipe then discharges from the concrete box structure at an elevation of 763.00 and connects to an existing 48-inch storm sewer at elevation 762.74. The

concrete box structure will include an open top that will act as a sharp-crested weir and allow for the discharge of larger storm events from the detention basin. The open top of the box structure will be mitered to the side slope of the detention basin and include a grate. The outlet structure also includes an emergency spillway at an elevation of 770.00. The emergency spillway will be lined with riprap to dissipate runoff velocity and prevent erosion. The emergency spillway will be incorporated to safely carry storms exceeding the 100-year storm event.

Construction methods, materials, and equipment will be consistent with normal construction methods. Typical construction equipment such as bulldozers, skid loaders, scrapers, backhoes, and haul trucks will be used to complete the construction at the site. The majority of work for this project will consist of excavation of earthen material from the proposed detention basin. The project also includes the installation of an inlet structure, storm sewer, an outlet structure, connection to the existing storm sewer system, and landscaping. Construction access to the site will be from Menard Drive from the west. Construction staging will occur in the areas surrounding the project. It is anticipated that construction will be completed in seven to eight months.

An existing drainage-way is located on the northwest corner of the proposed project site. As part of the evaluation of this project a detailed hydrologic and hydraulics analysis was completed. The analysis evaluated the flood control benefits of the proposed Armory Area Stormwater Detention Basin. As proposed, low flows will remain in the channel, and higher flows associated with flooding, will be diverted into the basin. Section 3.1.2.2 discusses the results of the flood control analysis in detail.

2.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

Alternative 3 would control flooding in the Campbell Creek watershed through the construction of a detention basin at what is currently Westhaven Golf Course. A detailed analysis of this option was studied by a consultant under contract with the City (Strand Associates – *Campbell Creek Stormwater Management Plan, Addendum 1*, February 2008). A brief description of this alternative is provided in this section.

The Westhaven Golf Course Detention Basin would be located within the City of Oshkosh west of the proposed Armory Area Stormwater Detention Basin site and would provide flood control benefits in the watershed, which includes the Armory Area Stormwater Detention Basin site. It would be located on a portion of the existing Westhaven Golf Course at 1400 South Westhaven Drive. A 3-foot x 6-foot box culvert would divert runoff from the upstream portion of the watershed into the proposed detention basin. Figure 4 (from the Strand Associates 2008 document) shows the conceptual layout of Alternative 3.

The Westhaven Golf Course detention basin would have a footprint of approximately 30 acres; have a storage capacity of 155 acre-feet, and a maximum depth of 20 feet. The entire site area is approximately 67 acres. Approximately 325,800 cubic yards of material would be excavated to construct the detention basin. The detention basin would consist of three permanent pools. The majority of runoff would enter the south pool and would flow into the subsequent pools through a 21-inch diameter storm sewer, or a drainage swale capable of conveying the 100-year storm peak flow. Slopes surrounding the entire detention facility would be a maximum of 4:1 and would tie into the surrounding grades.

The areas disturbed by construction would be restored using a combination of native plantings. Wetland plantings would occur around shallow areas of the detention basin and native prairie plantings would be placed on the detention basin side slopes and around the detention basin.

The primary inlet to the detention basin would be a 3-foot by 6-foot box culvert constructed to divert runoff from the south into the project site. The box culvert would divert runoff from an existing drainage-way adjacent to Universal Street. A small berm would be created within the drainage-way to divert runoff into the box culvert. Approximately 1,600 feet of box culvert would be needed through a storm sewer diversion on the golf course.

The diversion would begin south of the proposed project site and divert runoff into the detention basin through the box culverts. Runoff would also enter the detention basin through several smaller storm sewers (24-inch to 36-inch) serving drainage areas surrounding the project site.

The Westhaven Golf Course Detention Basin would discharge into the storm sewer north and east of the project site. A 15-inch and a 24-inch storm sewer would serve as the primary and secondary detention basin outlets. An emergency spillway would also be created.

Construction methods, materials, and equipment will be consistent with normal construction methods. Typical construction equipment such as bulldozers, skid loaders, scrapers, backhoes, and haul trucks will be used to complete the construction at the site. The majority of work for this project would consist of excavation of earthen material from the proposed detention basin. The project will also include the installation of an inlet structure, storm sewer, an outlet structure, connection to the existing storm sewer system, and landscaping. Construction access to the site will be obtained from Westhaven Drive along the west side of the project. Construction staging will occur in the areas surrounding the project. It is anticipated that construction time would be approximately one year.

2.4 Alternatives Considered and Eliminated from Further Consideration

A number of alternatives were evaluated and eliminated as part of previous studies. The following section describes these alternatives.

Smaller Armory Area Stormwater Detention Basin

The size of the Armory Area Stormwater Detention Basin could be reduced so that the detention basin would be located solely on the property currently owned by the Wisconsin Department of Military Affairs. This would reduce the detention basin size to be approximately 5.7 acres, and provide about 30 acre-feet of storage. Evaluation of the smaller Armory Area Stormwater Detention Basin showed that the flood reduction benefits of the smaller footprint were not adequate for downstream property protection. This alternative was eliminated based on the lower levels of flood control it would provide.

Underground Storage

Underground storage was evaluated as a way to reduce flooding and to eliminate the need to acquire land which would be dedicated solely to stormwater management. A typical installation of underground storage occurs beneath parking lots or athletic fields, and allows for the area to continue its current use. Immediately west of the proposed Armory Area Stormwater Detention Basin site is a commercial shopping center with large parking lots. This type of land use is a good candidate for underground storage. To provide an equal level of benefit to the proposed Armory Area Stormwater Detention Basin a similar amount of storage must be provided (80 acre-feet). Based on storm sewer and ground surface elevations, it is estimated that underground storage with a maximum height of approximately six feet could be constructed. This would require a footprint of about 13 acres. The construction of an underground detention area of this size is not practical as there is not 13 acres of suitable land use. Some additional challenges that would be encountered include:

1. Structure would need to be able to handle loads from vehicle traffic,
2. Other underground utilities would need to be relocated including sanitary sewer, water main, gas, fiber optic, electric, etc.,
3. High groundwater could cause structural "float" problems and/or seep into the storage system,

4. Increased maintenance demands to keep area free of trash and sediment, and
5. Very large construction costs.

Due to the logistical and cost issues with underground storage, it was eliminated from further consideration.

Conveyance System Upgrades

To reduce flooding, stormwater conveyance system improvements could be made to improve the flow capacity of the system. To provide a similar level of service as the Armory Area Stormwater Detention Basin, a parallel storm sewer (theoretically) could be installed to convey the stormwater that would be influent to the Armory Area Stormwater Detention Basin directly to the Fox River (approximately one mile downstream). One of the City's stormwater management goals is to maintain the peak water surface elevation from the 10-year rain event beneath the road surface. In order to achieve this goal for the area between the Armory Area Stormwater Detention Basin and the Fox River, approximately 5,400 feet of 60-inch storm sewer would be required. There are a number of logistical construction challenges, which makes this option impractical. These logistical challenges include conflicts with other utilities, such as sanitary sewer, water main, gas, electric, and fiber optic, and requirements for space within the existing right-of-way to construct a new storm sewer, as well as, the need to repair streets and other areas disturbed by the construction of the storm sewer. To resolve these logistical challenges and install an additional storm sewer would be cost prohibitive.

Stormwater Pump Station

An evaluation was conducted as to whether a stormwater pump station could reduce flooding by eliminating the backwater effects the Fox River places on the stormwater conveyance system. The evaluation determined that a 200 cfs lift station would be required to pump the maximum flow through the existing storm sewer in the watershed. The analysis of this mitigation measure showed that the pump station would have little impact on flooding within the watershed because of the limitations of the existing storm sewer system. The storm sewer upstream from the pump station is undersized and in order for flooding to be reduced either:

1. Improvements to the existing storm sewer allowing the conveyances of greater peak flow rates would be needed. The construction of a pump station with a capacity of greater than 200 cfs would then be required, or
2. Storage would need to be provided upstream in order to reduce the peak flow rates of stormwater reaching the storm sewer and pump system.

Because of the need for other flood management measures in order to be effective a stormwater pump station was eliminated from consideration.

3.0 Affected Environment and Consequences

3.1 Physical Environment

3.1.1 Geology and Soils

The project location is within the Campbell Creek Watershed in the City of Oshkosh (City), Wisconsin. Campbell Creek is an intermittent stream with a total watershed area of approximately 1,500 acres. Over the course of time, Campbell Creek has been channelized and large portions were converted to an enclosed storm sewer system. The project location is adjacent to an open channel portion of Campbell Creek in the central portion of the watershed. The channel is located along the northwest side of the project area. The elevation ranges from a minimum of 763 in the bottom of the channel to a maximum of 789 on top of a fill pile. The typical elevation throughout the site is 770 to 775. Following completion of the proposed project the minimum elevation of the site would be 760 and the maximum elevation would be 780.

Based on NRCS soil mapping (Soil Survey Winnebago County, WI) there are three identified soil series located within the project area

Manawa silty clay loam (MaA). Slopes generally range from 0 to 3 percent. Manawa silty clay loam is classified as part of hydrologic soil group C. The available water capacity is high, and the permeability of the limiting layer is very low to moderately low. Manawa soils occupy approximately 12.4 percent of the project site. Bedrock depths for this soil are noted as greater than 60 inches.

Kewaunee silt loam (KnB) consists of well drained and moderately well drained soils found on convex hills and lower side slopes; slopes generally range from 2 to 6 percent. The available water capacity of KnB is moderate, and the soil is somewhat poorly drained. Kewaunee silt loam is classified in hydrologic soil group C. Kewaunee soils occupy approximately 59.6 percent of the project site. Bedrock depths for this soil are noted as greater than 60 inches.

Omro clay loam (OmB) is a well drained soil found on gently sloping areas with grades between 2 and 6 percent. The available water capacity is moderate and permeability is slow or moderately slow. Omro clay loam is also classified in hydrologic soil group C. Omro soils occupy approximately 28.0 percent of the project site. Bedrock depths for this soil are noted as greater than 60 inches.

The Farmland Protection Policy Act (FPPA) (P.L. 97-98, Sec. 1539-1549; U.S.C. 4201, et seq.), which states that federal agencies must “minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses,” was considered in this EA. There is no loss of farmland associated with the proposed alternative of this project.

3.1.1.1 Alternative 1 – No Action Alternative

In this alternative, no construction would occur and there would be no impacts to geology or soils.

3.1.1.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

During the construction of the proposed Armory Area Stormwater Detention Basin, approximately 224,000 cubic yards of soil will be excavated. Typical excavation depths will range from between 7 feet and 18 feet. Most soil excavated from the site will be hauled off-site by the contractor. The excess material will be the responsibility of the contractor to find a suitable disposal site outside of regulatory floodplains/wetlands.

Topsoil will be removed from the construction area prior to excavation and stockpiled on the site. The topsoil will be replaced following excavation to allow vegetation to be established at the site following construction.

A subsurface soils exploration was conducted by AECOM at the proposed detention basin site. The soils exploration included soil borings, the excavation of test pits, and a seismic refraction survey. The results indicate that the soils which will be removed from the site are primarily topsoil, clay, and fractured limestone bedrock. In some locations fill material was also present. It is believed the fill material is from previous construction activities on areas adjacent to the detention basin site.

The Wisconsin Department of Natural Resources (WDNR) requires that a Wisconsin Pollution Discharge Elimination System (WPDES) Permit for construction site stormwater runoff be obtained prior to construction. This permit requires the implementation of construction site best management practices (BMPs) to prevent soil erosion and soil loss. Potential BMPs that may be installed include silt fence, erosion mat, inlet protection, and temporary seeding. Following the completion of construction, the site will be restored using topsoil and vegetation will be established to stabilize the site.

No geologic impacts are expected from the construction of the proposed Armory Area Stormwater Detention Basin.

3.1.1.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

Construction of the Westhaven Golf Course Detention Basin would require approximately 325,800 cubic yards of soil will be excavated. Excavation depths will be up to a maximum of 20 feet. Most soil excavated from the site will be hauled off-site by the contractor. The excess material will be the responsibility of the contractor to find a suitable disposal site outside of regulatory floodplains/wetlands. Topsoil will be removed from the construction area prior to excavation and stockpiled on the site. The topsoil will be replaced following excavation to allow vegetation to be established at the site following construction.

The WDNR requires that a WPDES Permit for construction site stormwater runoff be obtained prior to construction begins. This permit requires the implementation of construction site best management practices (BMPs) to prevent soil erosion and soil loss. Potential BMPs that may be installed include silt fence, erosion mat, inlet protection, and temporary seeding. Following the completion of construction, the site will be restored using topsoil and vegetation will be established to stabilize the site.

No geologic impacts would be anticipated if the Westhaven Golf Course Detention Basin were constructed.

3.1.2 Water Resources and Water Quality

The proposed Armory Area Stormwater Detention Basin is located within the Campbell Creek Watershed. Campbell Creek is identified by the WDNR Surface Water Data Viewer as an intermittent stream. It is not shown on the USGS Quad Map (See Figure 5). Within the project limits Campbell Creek is an open channel drainage-way of approximately 1,000 feet. The existing channel has eroded banks and, in sections, the top of bank is against existing building foundations. Survey data shows typical bank heights of four to eight feet. Upstream and downstream of the proposed project site, large sections of Campbell Creek were converted into a closed, storm sewer system. Sections that remain open channel are linear and have a trapezoidal cross section without a floodplain. They do not exhibit natural channel or floodplain characteristics.

Campbell Creek discharges into the Upper Fox River about one mile upstream from Lake Winnebago. The outlet from Lake Winnebago is the Lower Fox River which discharges to Green Bay and Lake Michigan. Both the Upper Fox River and Lake Winnebago are listed on Wisconsin's 303(d) list of impaired waters for contaminated sediments, total suspended solids, and phosphorus. Lake Winnebago is classified as highly eutrophic. Urban runoff and agricultural runoff are identified as major sources of the pollutants. Lake

Winnebago is also the potable water source for several adjacent cities including Appleton, Neenah, and Oshkosh. Lake Winnebago and the Upper Fox River system is noted as supporting North America's largest self-supporting Lake Sturgeon population.

3.1.2.1 Alternative 1 – No Action Alternative

Under this alternative there would be no impact to water resources or water quality. The existing channel erosion and flooding would remain.

3.1.2.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

As part of the proposed Armory Area Stormwater Detention Basin, the majority of runoff currently traveling through the drainage-way would be diverted into the proposed basin through the storm sewer and then discharged through an outlet structure back into the existing storm sewer system downstream from the site.

The Armory Area Stormwater Detention Basin would reduce stormwater flooding within the area downstream of the detention basin. A detailed hydrologic and hydraulic analysis was conducted to evaluate the impacts of the proposed project. The analysis showed that peak flow rates and water surface elevations would be decreased by the detention basin for rain events up to, and including, the 100-year storm event. The hydrologic and hydraulic analysis also evaluated the impact the proposed detention basin would have on structure and street flooding. A detailed report (AECOM: *Armory Detention Basin Hydrologic & Hydraulic Analysis*, October, 2010) identifies that 78 buildings (73 residential, 1 school, 4 commercial) would benefit from the Proposed Action. Three arterial roads would also have the depth and duration of flooding reduced. The report contains numerous detailed results. Below is a summary table from that report showing the Armory Area Stormwater Detention Basin flow control and storage volume for several rain events.

Storm Event	Peak Armory Basin Inflow (cfs)	Peak Armory Basin Outflow (cfs)	Peak Water Surface Elevation (feet)	Peak Storage Provided (acre-feet)
2-year	72	7	765.4	21.5
10-year	143	11	767.3	44.2
25-year	156	15	768.2	55.8
100-year	170	25	769.0	67.0

The current design of the proposed detention basin is primarily for flood control purposes; however, some stormwater pollution control would also be achieved. The detention basin would achieve a modest level of stormwater sediment control. The detention basin would also reduce floatables and other litter from travelling downstream to the Fox River. The detention basin would have no long-term adverse impacts to water resources.

Temporary impacts to downstream water resources may occur during the construction of the proposed Armory Area Stormwater Detention Basin. Strict construction erosion control measures are required under local and state regulations, and these measures would be employed during the construction phase.

Government permits required under this project include:

1. A WPDES construction site stormwater runoff permit. The permit requires the use of BMPs to prevent erosion from occurring at the construction site and ensuring proper stabilization of the site following construction. An erosion control plan will be developed as part of the proposed project design. The erosion control plan will contain specific measures to reduce the likelihood of construction site erosion. It is likely that silt fence, tracking pads, inlet protection, and erosion mat will be included as part of the erosion control plan. The erosion control measures will comply with state and City of Oshkosh regulations
2. A WDNR Chapter 30 Permit: This permit is required by the State of Wisconsin for most construction projects in or near a waterway or wetland. The permit process addresses potential wetland issues, channel impacts, water quality certification, and land disturbance near wetlands or waterways. A Chapter 30 Permit application is in process and the project will meet all requirements of the permit.
3. United States Army Corps of Engineers (USACE) Section 404 Permit: This permit may be required by the USACE for potential wetland and waterway impacts. The City of Oshkosh is currently in the application preparation process in order for the USACE to determine their jurisdiction.

A meeting was held with the City, WDNR, AECOM and USACE on December 14, 2011 to review requirements for the proposed project. Information regarding the proposed project was provided to the agencies at the meeting. The WDNR and USACE requested additional information and it was provided in an email from AECOM on behalf of the City dated January 5, 2012. A second meeting was held with the City, WDNR, AECOM, and USACE on February 6, 2012 to further discuss the project. At the date of this writing, discussions are continuing to progress regarding the permitting for the project.

3.1.2.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

As part of the evaluation process for the Westhaven Golf Course Detention Basin and Storm Sewer Diversion a planning level hydrologic and hydraulic analysis was conducted to assess the flood control benefits of the project. The analysis displayed that flooding would be reduced by the implementation of this project.

The design for this alternative is primarily for flood control purposes; however stormwater pollution control would also be achieved. The detention basin with this alternative is proposed to have permanent pools of water. This design generally achieves a higher level of stormwater pollution sediment control than a “dry” basin design. Besides the improvement to downstream water quality, the Westhaven stormwater facility would have no long-term impacts to water resources.

Temporary impacts to downstream water resources may occur during the construction of the Westhaven Golf Course Detention Basin. A WPDES construction site stormwater runoff permit would be required for this project. The permit requires the use BMPs to prevent erosion from occurring at the construction site and ensuring proper stabilization of the site following construction. An erosion control plan would be developed as part of the project design. The erosion control plan would contain specific measures to reduce the likelihood of construction site erosion. It is likely that silt fence, tracking pads, inlet protection, and erosion mat would be included as part of the erosion control plan.

Specific permit requirements for this project are unknown since there was no formal correspondence with regulatory agencies. Likely government permits required under this project would include WPDES construction site stormwater permit, a WDNR Chapter 30 Permit and USACE Section 404 Permit. Similar conditions would need to be met as described for Alternative 2.

3.1.3 Floodplain Management (Executive Order 11988)

This project is not within the 100-year floodplain as indicated in the FIRM (Flood Insurance Rate Map), Panel #215 for Winnebago County, Wisconsin. FEMA applies the Eight-Step Decision-Making Process to ensure that it funds projects consistent with Executive Order (EO) 11988. The NEPA compliance process involves essentially the same basic decision-making process to meet its objectives as the Eight-Step Decision-Making Process. Therefore, the Eight-Step Decision-Making Process has applied through implementation of the NEPA process. Documentation displaying the eight-step planning process is included in Appendix B.

3.1.3.1 Alternative 1 – No Action Alternative

Under the No Action Alternative, there would be no changes to the existing conditions and flooding would continue within the Campbell Creek watershed.

3.1.3.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

The proposed Armory Area Stormwater Detention Basin is located within the Campbell Creek Watershed in the City of Oshkosh. The project is not within any federally identified floodplain. However, the Campbell Creek Watershed is subject to flooding. Over the course of time, development within the Campbell Creek Watershed has impacted the area and enclosed most of the open channel drainage-ways into storm sewers. Remaining open channel segments within the watershed are linear in nature and do not include natural floodplains. Remaining open channels are more typical of a roadside ditch than a natural stream.

There are no federal, state, or local floodplain management regulations for this project because it is not located in an identified floodplain. However, a hydrologic and hydraulic analysis was conducted to review impacts of the project upstream and downstream of the project location and ensure that the project is consistent with proper floodplain management. The Armory Area Stormwater Detention Basin will provide storage for stormwater runoff and reduce peak flow rates and water surface elevations downstream of the project. The hydrologic and hydraulic analysis showed that the project would not cause any adverse impacts upstream or downstream of the project location.

No impacts to the regulatory 100-year floodplain are anticipated, and this alternative is in compliance with EO 11988.

3.1.3.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

The Westhaven Golf Course Detention Basin would also be located outside of the 100-year floodplain. The project would include the installation of a new storm sewer to divert stormwater into the Westhaven Golf Course Detention Basin. The detention basin would provide storage area and reduce stormwater runoff peak flow rates and water surface elevations downstream of the detention basin. The storm sewer diversion would increase the capacity of the drainage system and reduce flooding along the storm sewer route. Preliminary hydrologic and hydraulic analysis prepared as part of a planning level evaluation of this alternative displayed that there were no adverse impacts due to the project. However, a more detailed analysis would need to be conducted to verify the preliminary findings.

No impacts to the regulatory 100-year floodplain are anticipated, and this alternative is in compliance with EO 11988.

3.1.4 Air Quality

The Clean Air Act (CAA) requires the United States Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The CAA established two types of national air quality standards: primary standards set limits to

protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly; along with secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation and buildings. Current criteria pollutants are: Carbon Monoxide (CO), Nitrogen Dioxide (NO₂), Ozone (O₃), Lead (Pb), Particulate Matter (PM₁₀), and Sulfur Dioxide (SO₂).

The USEPA designates areas as either NAAQS attainment or non-attainment areas. An area is considered a non-attainment area if it does not meet the national primary or secondary air quality standards for a pollutant. Based on information obtained from the USEPA website, Winnebago County, Wisconsin is considered within attainment status for all pollutants (USEPA website, see Section 7.0).

3.1.4.1 Alternative 1 – No Action Alternative

If no action is taken, there will be no construction activities that would occur. Therefore, no impacts to air quality would take place.

3.1.4.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

The construction of the proposed Armory Area Stormwater Detention Basin may result in temporary, short-term impacts to air quality. Impacts may result from the operation of diesel and gasoline engines associated with excavation, grading, and other equipment during the construction phase. Also, during the construction phase, exposed soil could temporarily increase airborne particulate matter in the local area. The proposed project would not create any long-term increases in pollutants that adversely impact air quality.

To reduce the temporary impacts to air quality, measures will be undertaken during the construction of the proposed Armory Area Stormwater Detention Basin. To reduce the emission of criteria pollutants, fuel-burning equipment running times would be kept to a minimum. To minimize the impact of airborne particulates, open construction areas will be minimized, and construction site practices will follow WDNR Technical Standard 1068, “Dust Control on Construction Sites.”

3.1.4.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

The construction of Alternative 3 may result in temporary, short-term impacts to air quality. Impacts may result from the operation of diesel and gasoline engines associated with excavation, grading, and other equipment during the construction phase. Also, during the construction phase, exposed soil could temporarily increase airborne particulate matter in the local area. The proposed project would not create any long-term increases in pollutants that adversely impact air quality.

To reduce the temporary impacts to air quality, measures will be undertaken during the construction of Alternative 3. To reduce the emission of criteria pollutants, fuel-burning equipment running times would be kept to a minimum. To minimize the impact of airborne particulates, open construction areas will be minimized, and construction site practices will follow WDNR Technical Standard 1068, “Dust Control on Construction Site.”

3.2 Biological Environment

3.2.1 Terrestrial and Aquatic Environment

The proposed project location is within the City of Oshkosh. It is located on portions of two parcels both of which were previously disturbed. Historically, the area was farmed. The southern portion of the site is a paved parking/storage area that includes two buildings. The eastern portion of the site is currently a portion of the Wisconsin National Guard Armory. The area has been re-graded and includes a dry detention basin, a wet detention basin, and a large soil stockpile. The remaining portions of the project area are vegetated with a

predominance of non-native grasses, shrubs, and trees. Common plant species observed at the site include: Kentucky bluegrass, Reed canary grass, Solidago, Buckthorn, Sumac, Box Elder, Green Ash, and Willow.

A wetland delineation was conducted on the site in the Fall of 2011. The results of this delineation are included in a report attached to this EA within Appendix D. Four highly disturbed wetlands were identified with a total area of 0.9 acres. Plant species identified in the wetland area are listed below:

Kentucky bluegrass	Giant goldenrod	Tall goldenrod	Reed canary grass
Canada thistle	Common buckthorn	Sand bar willow	Rattlesnake master
River bank grape	Curly dock	Box elder	Queen annes lace
Narrow leaved cattail	Pink weed	Common milkweed	Common dandelion
Red clover	Smooth brome	Honeysuckle	Sedge s.p.p.

No site specific wildlife survey was conducted; however, common urban mammals, birds, and reptiles have been observed at the site. No endangered or threatened species are known to exist at the site.

The existing open channel drainage-way located on a portion of the project area was previously straightened and re-routed. The channel is designated as "intermittent" and is not on the State's 303(d) list of impaired waters.

3.2.1.1 Alternative 1 – No Action Alternative

Under this alternative there would be no anticipated changes to the site's existing terrestrial, biologic, or aquatic conditions.

3.2.1.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

As part of the proposed project, a detention basin will be created on a site with a footprint of about 13.4 acres. The detention basin would have a small permanent pool of water approximately 2-acres. The areas of the site above the permanent pool of water would be planted with a variety of native plant species. The landscaping would include a mixture of grasses, forbs, and sedges as appropriate for the site conditions. Areas closer to the permanent pool of water, which is subject to more frequent inundation, would be planted with a shoreline plant mixture conducive to wet environments. Areas further from the water will be planted with prairie plantings tolerating variable soil moisture conditions with occasional flooding. Following restoration of the proposed detention basin, it is believed that the site will create an environment that exceeds the quality of the existing area in terms of native plant vegetation and diversity of vegetation.

In addition, based upon other similar stormwater management basins created by the City, the water feature attracts and provides habitat for resident water fowl, amphibians, small mammals, and migratory bird species.

3.2.1.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

The location of Alternative 3 is an existing golf course. The location of Alternative 3 is composed of turf-grass that is regularly mowed, and a variety of trees located within the golf course. If this project were implemented, a detention basin would be constructed within the golf course. The detention basin would have a series of three permanent pools connected by a channel system. The golf course would be modified, however, it would remain in place. The detention basin would be integrated into the golf course and landscaping surrounding the detention basin would include prairie plantings, mowed golf course turf-grass, and selected trees as appropriate for the golf course environment. It is believed that the implementation of Alternative 3 would have a neutral impact to the environment. Following the detention basin construction, the area would be restored to a similar state to which currently exists.

3.2.2 Wetlands (Executive Order 11990)

Executive Order 11990, Protection of Wetlands, requires federal agencies to take action to minimize the loss of wetlands. The NEPA compliance process requires federal agencies to consider direct and indirect impacts to wetlands, which may result from federally funded actions.

3.2.2.1 Alternative 1 – No Action Alternative

In the No Action Alternative there would be no construction activities; therefore, no impacts to wetlands.

3.2.2.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

As reported in Section 3.2.1, approximately 0.9 acres of wetland would be disturbed with the proposed action. The City is working with the USACE and the WDNR to obtain the appropriate federal and state permits for this action. Wetland avoidance and mitigation measures are in place to meet the regulations.

3.2.2.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

At the location of the Westhaven Golf Course Detention Basin, there is no wetland delineation and the presence of wetlands is unknown. A review of Wisconsin Wetland Inventory mapping was conducted to screen for the presence of wetlands. The mapping indicated that there were no known wetlands present; however, wetland indicator soils exist at the site. Before any construction activities can begin at the Westhaven Golf Course Detention Basin, a wetland delineation would be required. Based on available knowledge of the site, it is believed that there are no wetlands at the Westhaven Golf Course site and that no impacts to wetlands would occur as part of the Westhaven Golf Course Detention Basin project.

3.2.3 Threatened and Endangered Species

In accordance with Section 7 of the Endangered Species Act (ESA) of 1973, the project area was evaluated for the potential occurrences of federally listed threatened and endangered species. The ESA requires any federal agency that funds, authorizes, or carries out an action to ensure that their action is not likely to jeopardize the continued existence of any endangered or threatened species (including plant species) or result in the destruction or adverse modification of designated critical habitats (FEMA 1996).

The United States Department of the Interior, Fish and Wildlife Service (USFWS) was contacted by FEMA to review their records for the likelihood of Federal Threatened or Endangered Species to be encountered in the project area. A consultation letter from WEM was sent on August 11, 2011. The USFWS responded that, “no federally-listed, proposed, or candidate species would be expected within the project area.” And that “no critical habitat is present.”

3.2.3.1 Alternative 1 – No Action Alternative

The No Action Alternative would not disturb any ground area and therefore would not impact any threatened or endangered species.

3.2.3.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

The proposed Armory Area Stormwater Detention Basin site is currently a mix of open space and commercial development. The southwest portion of the site contains two commercial buildings surrounded by a paved parking/storage area. The northwest portion of the site is undeveloped open space. The area is currently vegetated. The eastern half of the site is currently a portion of the Wisconsin National Guard Armory. This portion of the site includes previously disturbed and graded grassed areas, a dry detention basin, and a wet detention basin. A drainage-way crosses the site. The drainage-way has previously been modified and is currently straight and contains some vegetation on the side slopes.

During development of the conceptual design of the Proposed Action, a WDNR Project Pre-Screen was submitted. During the Pre-Screen, WDNR staff reviewed available databases to determine potential permitting requirements for the proposed project. As part of the review, the potential presence of Purple Milkweed (*Asclepias purpurascens*) was identified according to the WDNR pre-screening process. It should be noted that this process does not mean that this species exists on the site. It only means that the species has been noted in the general area of the project site. According to the county list published on the WDNR's website (http://dnr.wi.gov/org/land/er/nhi/CountyData/pdfs/Winnebago_County.pdf), the Purple Milkweed was not listed for the township (T18N R16E) in which the Alternative 2 project is located. This species was not observed during the wetland delineation process.

3.2.3.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

The site is an artificially landscaped golf course and no endangered or threatened species are expected to exist on this site.

3.3 Hazardous Materials

As part of a separate study, AECOM conducted a review of existing data and compiled a report titled, "Environmental Review of Historical Records for the Proposed Armory Detention Basin, Oshkosh, Wisconsin." This report evaluated existing data from a number of information sources, including:

- Historic Sanborn® Fire Insurance maps,
- Available environmental database information,
- Historical Aerial Photographs of the area,
- Wisconsin Department of Natural Resources and Department of Commerce file information,
- City of Oshkosh Sanitation Department report regarding historic landfills, and
- Site reconnaissance information that includes site photos and field observations.

The report indicated that there was a slight potential from a property northwest of the project site for impacts to groundwater within the project area from a former drycleaner. A memo was prepared by AECOM to summarize this report and is included in Appendix E.

As a follow up to this report, a second investigation was conducted to focus on the area of potential groundwater contamination. A review of WDNR files resulted in the conclusion that contamination within the project area was unlikely. A copy of the addendum is also included in Appendix E.

The WDNR was contacted to review the project area and the potential for hazardous materials. A review of the proposed project area by WDNR staff revealed that there were three remediation and redevelopments sites in the vicinity of the project area. All three sites were listed on WDNR databases as "No Action Required." No additional information or permits would be required for the project. Correspondence from WDNR staff is included in Appendix C.

3.3.1 Alternative 1 – No Action Alternative

If no action is taken, there would be no ground disturbed and hazardous materials would not be encountered or disturbed. Any existing hazardous materials would remain in their present condition.

3.3.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

The environmental review conducted by AECOM showed that hazardous materials are unlikely to be encountered as part of the proposed Armory Area Stormwater Detention Basin. If hazardous materials are found during construction, appropriate measures will be taken to identify, remove, and dispose of the

contaminated soils. Any hazardous materials encountered would be handled in accordance with applicable rules and regulations.

3.3.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

The environmental review conducted by AECOM for the proposed Armory Area Stormwater Detention Basin area did not include a review of the project site for the Westhaven Golf Course Detention Basin and Storm Sewer Diversion. Based on the current land use of the site (golf course) and the surrounding residential land uses, it is believed that hazardous materials would not be encountered as part of the project. If hazardous materials are found during construction, appropriate measures will be taken to identify, remove, and dispose of the contaminated soils. Any hazardous materials encountered would be handled in accordance with applicable rules and regulations.

3.4 Socioeconomics

3.4.1 Zoning and Land Use

The proposed project would be located on portions of two existing parcels within the City of Oshkosh, Wisconsin. The parcels are 1415 Armory Place and 1530 South Koeller Street, City of Oshkosh, Wisconsin, 54902. The parcel located at 1415 Armory Place is currently a part of the Wisconsin National Guard Armory. The portion of the parcel to be used for the proposed project is currently open space that is unused by the Armory. This area has not been previously developed and was agricultural lands in the past. The parcel located at 1415 Armory Place is zoned residential and parcel located at 1530 Koeller Street is zoned commercial.

The parcel located at 1530 South Koeller Street is a part of a commercial development. The proposed Armory Area Stormwater Detention Basin would be located on the east side of the parcel. This part of the parcel currently consists of a paved parking/storage area and two buildings. The existing buildings are currently used as warehouse storage. The entire parcel was previously used as a big box home improvement store. The parcel has been redeveloped and the western portion of the parcel is a commercial development. This parcel is currently zoned commercial and is also located within the City's Highway 41 Corridor zoning district.

A current zoning map for this part of the City of Oshkosh is included as Figure 6.

3.4.1.1 Alternative 1 – No Action Alternative

Under this alternative there would be no change to the current zoning and land use conditions.

3.4.1.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

Under this alternative the current open space and commercial land cover would be converted to a stormwater detention basin and associated open space surrounding the basin.

3.4.1.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

Currently the Westhaven site is zoned residential (R-1). If the detention basin were to be implemented at this site, the zoning would remain unchanged.

3.4.2 Visual Resources

The proposed project site's land cover is an isolated combination of private land open space (about 14 acres) and parking lot/buildings (about 4.12 acres). The vegetated portions of the site are predominantly old field growth with a small group of trees in the west central portion. This site is fully surrounded by developed, urbanized land. Single family residential homes are on the north and part of the west, the Wisconsin National

Guard buildings are on the east and south, and commercial retail property is on the west and south sides of the site. Since the site is currently private property, there is no public access available.

3.4.2.1 Alternative 1 – No Action Alternative

The No Action Alternative would not change the current visual character of the proposed site. Also, the site would remain in private ownership.

3.4.2.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

This action would remove the current parking lot (approximately 3.44 acres) buildings (approximately 30,000 square feet) on the western portion of the site. The current vegetative cover on the remaining portions of the site would be replaced with a pond feature and landscaping consisting of wetland, native prairie, and selected tree species. As a result of this project, there would also be public access available. The visual impact would be a more diversified landscape with a pond, and a variety of vegetation.

Temporary visual impacts will occur during the construction of the proposed detention basin. Construction equipment will be present at the site, along with temporary material stockpiles. These impacts will be limited and short-term in nature.

3.4.2.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

Under this alternative the site's ownership would not change. The visual impacts on the current golf course setting would be updated larger water features and the introduction of a greater variety of landscaped features. The change to the current visual resources would be minimal.

Temporary visual impacts would occur during the construction of the project. Construction equipment will be present at the site, along with temporary material stockpiles. These impacts would be limited and short-term in nature.

3.4.3 Noise

Sound is most commonly measured in decibels (dB) on the A-weighted scale, which is the scale most similar to the range of sounds that the human ear can hear. The City of Oshkosh has enacted an ordinance (Chapter 15, Health) which sets limitation on allowable noise levels and describes the measurement criteria. The ordinance defines "excessive noise" and establishes construction activity requirements.

3.4.3.1 Alternative 1 – No Action Alternative

The No Action Alternative would not change the current conditions at the proposed site relative to noise and activities. Current sound sources at the site are from military gasoline and diesel vehicles and vehicles using the existing commercial parking lot.

3.4.3.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

Most noise associated with this alternative would be emitted by the construction equipment used during the excavation of the detention basin, removal of material, placement of concrete structures, and final grading of the site. The proposed project must comply with Oshkosh City Ordinance Chapter 15, Health, Article V, Excessive Noise, which defines allowable hours of construction and noise levels at property boundaries.

No long-term negative effects associated with noise are anticipated under this alternative.

3.4.3.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

Most noise associated with this alternative would be emitted by the construction equipment used during the excavation of the detention basin, removal of material, placement of concrete structures, and final grading of the site. The proposed project must comply with Oshkosh City Ordinance Chapter 15, Health, Article V, Excessive Noise, which defines allowable hours of construction and noise levels at property boundaries.

No long-term negative effects associated with noise are anticipated under this alternative.

3.4.4 Public Service and Utilities

The City of Oshkosh provides Police and Fire protection to the project area and the entire City. During times of flooding, the ability to provide these services is reduced. During moderate to heavy rain events, street flooding occurs in the project area and reduces the ability to travel and increases travel times. This impacts the ability of the City to provide Police and Fire protection. Two schools are also located in the area impacted by the project. Flood events have caused property damage to these schools. The ability to conduct normal operations is also reduced during times of flooding.

There are a number of public utilities within the vicinity of the Armory project.

- Storm sewer and a stormwater drainage-ways are located in the vicinity of the project. Public storm sewer enters the project area from the west and discharges into an open channel drainage-way located along the northwest side of the project area. Along the north project boundary, the drainage-way discharges into a storm sewer that leaves the site and flows to the north.
- Sanitary sewer is not located within the proposed project limits. There is sanitary sewer in the area surrounding the project.
- A water main is located on the northwest side of the project area.
- Gas mains are located along the west side of the proposed project site.
- Overhead power lines are located along the south boundary of the site.

3.4.4.1 Alternative 1 – No Action Alternative

If no action is taken public services and utilities would not be impacted by construction and would continue to function as they do today. However, they will continue to be impacted due to flooding. During times of flooding the following utilities are impacted.

- Sanitary sewer – Flooding causes increased inflow and infiltration of stormwater into the sanitary sewer system. This increase causes sanitary sewer basement back-ups and increased hydraulic loading to the wastewater treatment facility.
- Police, Fire and EMT vehicle access can be hampered during street flooding periods.

3.4.4.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

Due to the construction of the proposed Armory Area Stormwater Detention Basin, there would be no disruptions or negative impacts to public services. All roads will remain open to traffic for the duration of the construction project. Following construction of the proposed project, there would be a reduction in the frequency, duration, and depth of flooding that occurs around the project area. This will reduce the disruptions to public emergency services and also lessen the need for emergency responses during flood events. Also, after construction of the proposed basin, there would be a reduction in the volume of stormwater infiltration to the sanitary sewer system.

The construction of the proposed Armory Area Stormwater Detention Basin would avoid disruptions to public utilities. The layout of the detention basin avoids existing public utilities. A new storm sewer will be installed to

divert stormwater into the proposed detention basin. During construction, adequate drainage measures will remain in place to maintain the existing flow conditions surrounding the site. Following construction, the disruptions to public utilities caused by flooding will be reduced. Stormwater will be detained within the basin and away from other utilities.

3.4.4.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

Similar to the proposed alternative, Alternative 3 would avoid disruptions or negative impacts to public services. All roads will remain open to traffic for the duration of the construction project. Following construction of the proposed project, there would be a reduction in the frequency, duration, and depth of flooding that occurs around the project area. This will reduce the disruptions to public emergency services and also lessen the need for emergency responses during flood events. Also, after construction of the proposed basin, there would be a reduction in the volume of stormwater infiltration to the sanitary sewer system.

The construction of this alternative would likely create short-term utilities disruptions. The construction of the storm sewer diversion into the detention basin would likely require other utilities to be relocated. This may require utilities such as sanitary sewer service and water service to be shut down to individual properties for a short period while those utilities are relocated. Following construction of this alternative, the disruptions to public utilities caused by flooding would be reduced. Stormwater will be detained within the basin and away from other utilities.

3.4.5 Traffic and Circulation

There are no public streets within any of the alternative project sites.

3.4.5.1 Alternative 1 – No Action Alternative

This alternative would cause no change to the current traffic and circulation conditions.

3.4.5.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

During the construction phase of this alternative, there would be an increase of construction equipment and worker vehicles on the streets near the construction site. Likely access points to the construction site would be from Menard Drive, which is a dead-end street off of South Koeller Street. The contractor will be required to comply with a traffic plan as developed for the project. The construction phase of the project would likely take 7 – 8 months.

No long-term traffic or circulation impacts would result from this project. The project would result in a reduction in street flooding. Thus, a long-term traffic benefit would be expected.

3.4.5.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

During the construction phase of this alternative, there would be an increase of construction equipment and worker vehicles on the streets near the construction site. Likely access points to the construction site were not considered. The contractor would be required to comply with a traffic plan as developed for the project. The construction phase of the project would likely approximately 1 year.

No long term traffic or circulation impacts would result from this project. The project would result in a reduction in street flooding. Thus, a long-term traffic benefit would be expected.

3.4.6 Environmental Justice (Executive Order 12898)

On February 11, 1994, President Clinton signed Executive Order (EO) 12898: “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.” The EO directs federal agencies,

“to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States.”

The proposed project is located within the City of Oshkosh, which has a 2010 total population of 66,083 individuals. Of that population 90.5 percent is white, 3.1 percent is black or African American, 0.8 percent is American Indian or an Alaskan Native, 3.2 percent is Asian, and 2.7 percent is Hispanic (2010 US Census). The median household income in the City of Oshkosh is \$37,636 and 5.2 percent of the population lives below the poverty level (<http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>). The proposed project, as well as Alternative 3, is located in areas where the demographics of the City would also represent the surrounding area which would be impacted by the project.

The City of Oshkosh and Winnebago County generally have lower minority population percentages than the State of Wisconsin. The City has a lower median income level than the State median; however, the percent of people living below the poverty level is slightly lower than the State average. Winnebago County's median income level is slightly greater than the State median, and the percentage of people living below the poverty level is well below the State average.

In compliance with FEMA's policy implementing EO 12898, Environmental Justice, the socioeconomic conditions and potential effects related to the No Action, Proposed Action, and Alternative 3 have been reviewed. By reviewing the information from the U.S. Census described above, it was determined that there would not be a disproportionately high or adverse impact to minority or low-income populations from any of the three alternatives.

The proposed project will reduce the impacts of flooding and benefit people living within the City of Oshkosh. There would be a reduction in the damage caused to private property, a reduction in the amount and length of travel disruptions caused by flooding, and improved public safety.

3.4.7 Safety and Security

Safety and security issues that have been considered in this analysis include the health and safety of the area residents, and the protection of personnel involved in activities related to the construction of the action alternatives. All safety and security standards as established by the federal Occupational Safety and Health Administration (OSHA) would be implemented and followed for the duration of the construction. Dam safety in Wisconsin is regulated by the WDNR under Wisconsin Statutes, Chapter 31. None of the detention basins described in this EA qualifies as a dam under the Chapter 31 definition.

3.4.7.1 Alternative 1 – No Action Alternative

If no project is undertaken, the risk of flooding would remain in the area downstream of the proposed project site. Without construction of a flood mitigation project the potential for impacts to safety and security due to flooding would remain and be greater than either of the other two alternatives.

The No Action Alternative would not include construction; therefore, there would be no safety risks stemming from construction activities.

3.4.7.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

The Proposed Action would reduce the frequency and intensity with which flooding would occur. This would reduce the impact to the safety and security of the surrounding neighborhood. Several safety factors would be incorporated into the design of the detention basin in accordance with State of Wisconsin Technical Standard 1001. These safety features include;

- The planting of tall, native vegetation on the side slopes surrounding the detention basin to discourage people from approaching the detention basin.
- The construction of a safety shelf around the detention basin pool area perimeter. The safety shelf would be located just below the normal water level and include a flat area at least 10 feet in width and water depths of less than one foot.
- The installation of grates over the detention basin inlet and outlet to prevent people from entering the storm sewer.

During the construction of the proposed Armory Area Stormwater Detention Basin, a safety risk would exist for those working on the construction of the project. To minimize the risks to safety and human health, all construction activities would be performed using qualified personnel trained in the proper use of the appropriate equipment including all appropriate safety precautions; additionally, all activities would be conducted in a safe manner in accordance with the standards specified in the OSHA regulations.

3.4.7.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

The Alternative 3 Action would reduce the frequency and intensity with which flooding would occur. This would reduce the impact to the safety and security of the surrounding neighborhood. Several safety factors would be incorporated into the design of the detention basin in accordance with State of Wisconsin Technical Standard 1001. These safety features include;

- The planting of tall, native vegetation on the side slopes surrounding the detention basin to discourage people from approaching the detention basin.
- The construction of a safety shelf around the detention basin perimeter. The safety shelf would be located just below the normal water level and include a flat area at least 10 feet in width and water depths of less than one foot.
- The installation of grates over the detention basin inlet and outlet to prevent people from entering the storm sewer.

During the construction of the Alternative 3 Westhaven Golf Course Detention Basin, a safety risk would exist for those working on the construction of the project. To minimize the risks to safety and human health, all construction activities would be performed using qualified personnel trained in the proper use of the appropriate equipment including all appropriate safety precautions; additionally, all activities would be conducted in a safe manner in accordance with the standards specified in the OSHA regulations.

3.5 Historic and Cultural Resources

3.5.1 Historic Structures

In addition to review under NEPA, consideration of effects to historic properties is mandated under Section 106 of the National Historic Preservation Act (NHPA), as amended, and implemented by 36 CFR Part 800. Requirements include identification of significant historic properties that may be affected by the Proposed Action. Historic properties are defined as archaeological sites, standing structures, or other historic resources listed in or eligible for listing in the National Register of Historic Places (NRHP) (36 CFR 60.4).

As defined in 36 CFR Part 800.16(d), the Area of Potential Effect (APE), “is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist.”

In addition to identifying historic properties that may exist in the proposed project's APE, FEMA must also determine, in consultation with the appropriate State Historic Preservation Officer (SHPO)/Tribal Historic Preservation Officer (THPO), what effect, if any, the action will have on historic properties. Moreover, if the

project would have an adverse effect on these properties, FEMA must consult with SHPO/THPO on ways to avoid, minimize, or mitigate the adverse effect.

On August 11, 2011, FEMA made a determination that no historic properties were likely to be affected by the proposed project through a letter sent to the Wisconsin SHPO regarding the proposed Armory Area Stormwater Detention Basin project. The letter included background information and the results of a desktop archaeological review conducted by FEMA. In a response letter dated August 30, 2011 the Wisconsin SHPO stated that they had reviewed the project and concurred that no historic structures would be affected. All communication regarding the review of historic structures is included in Appendix C.

3.5.1.1 Alternative 1 – No Action Alternative

Under the No Action Alternative, no construction activities would occur and there would be no impacts to historic structures.

3.5.1.2 Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)

Based on the review conducted by the Wisconsin SHPO, it is not anticipated that any historic or cultural resources within the project area will be impacted by the Proposed Action. However, if any human or archeological remains are encountered during construction, work at the site would be stopped immediately and FEMA and the SHPO would be contacted immediately.

3.5.1.3 Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion

Alternative 3 would construct a project similar to the Proposed Action; however, it would be larger and located west of the proposed project site. The location of Alternative 3 is currently a golf course and is surrounded by residential homes, apartments, and commercial buildings. The entire site was previously disturbed during construction of the golf course. It is not anticipated that the construction of Alternative 3 would impact any historic structures.

3.5.2 Tribal Coordination and Religious Sites

On January 19, 2012 Amanda Ratliff (FEMA Regional Environmental Officer) sent letters informing recipients of the proposed project to:

1. Mr. William Quackenbush (Tribal Historic Preservation Officer, Ho-Chunk Nation), and
2. Mr. John Blackhawk (Chairman, Winnebago Tribe of Nebraska).

The letter details the project location and proposed extent of activity and requested comments from the recipients regarding potential impacts on cultural properties of historic or traditional significance. The letter requested comments within 30 days and as of March 10, 2012, no responses were received by FEMA. It is understood that there are no impacts to cultural properties of historic or traditional significance. However, if any human or archeological remains are encountered during construction, work at the site would be stopped immediately and FEMA and the SHPO would be contacted immediately.

3.6 Comparison of Alternatives

A summary of the anticipated environmental impacts is displayed in Table 3-2 for each alternative. This table summarizes the information discussed in the previous sections of the EA.

Table 3-2 Alternatives Comparison Summary			
A. Description of Alternative	Alternative 1 – No Action Alternative	Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)	Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion
	<ul style="list-style-type: none"> • No flood mitigation measures implemented. • Flooding would continue to impact roads, buildings and other infrastructure. 	<ul style="list-style-type: none"> • Construction of detention basin providing 80 acre-feet of storage. • Construction of inlet storm sewer and outlet structure to control flows. 	<ul style="list-style-type: none"> • Construction of detention basin providing 155 acre-feet of storage. • Construction of 1600 LF of 3’x6’ box culvert diversion sewer. • Construction of outlet structure to control flows.

**Table 3-2
 Alternatives Comparison Summary**

B. Potential Impacts	Alternative 1 – No Action Alternative	Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)	Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion
Geology and Soils	<ul style="list-style-type: none"> No impacts to soils or site geology. 	<ul style="list-style-type: none"> Excavation of 224,000 cubic yards of soil during construction. Disturbed area of 18 acres for construction. Excavation depths from 7 to 18 feet below existing ground elevations. Potential for soil erosion. Construction site BMPs to be installed during construction. Some removal of bedrock may be necessary. No other geologic impacts from Armory Basin construction. 	<ul style="list-style-type: none"> Excavation of 325,800 cubic yards of soil during construction. Excavation depths of up to 20 feet below existing ground elevations. Potential for soil erosion. Construction site BMPs would be needed during construction. Some removal of bedrock may be necessary. No other geologic impacts.
Water Resources and Water Quality	<ul style="list-style-type: none"> No impact to water resources or water quality. No change in current stormwater pollutant loads to Fox River and Lake Winnebago. 	<ul style="list-style-type: none"> Erosion and sedimentation may occur from the construction site. Construction site BMPs to be used to mitigate impacts. Reduction in building and street flooding . Reduction in peak flow rates. Stormwater pollution control achieved by detention basin. Incremental improvement to water quality of Fox River and Lake Winnebago. No long-term adverse impacts anticipated. 	<ul style="list-style-type: none"> Erosion and sedimentation may occur from the construction site. Construction site BMPs to be used to mitigate impacts. Reduction in building and street flooding. Reduction in peak flow rates. Stormwater pollution control achieved by detention basin. Incremental improvement to water quality of Fox River and Lake Winnebago. No long-term adverse impacts anticipated.
Floodplain Management	<ul style="list-style-type: none"> No impact to and floodplains. (no legal floodplain in project area or storm sewer system downstream from project area.) 	<ul style="list-style-type: none"> Project not located within FEMA identified floodplain. Project would reduce flooding within Campbell Creek watershed. No adverse impacts upstream or downstream of project. 	<ul style="list-style-type: none"> Project not located within FEMA identified floodplain. Project would reduce flooding within Campbell Creek watershed. No adverse impacts upstream or downstream of project.

**Table 3-2
 Alternatives Comparison Summary**

B. Potential Impacts	Alternative 1 – No Action Alternative	Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)	Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion
Air Quality	<ul style="list-style-type: none"> No impacts to air quality. 	<ul style="list-style-type: none"> Construction equipment exhaust may cause temporary, short-term impact to local air quality. Potential for exposed soil and dust during construction. Open construction areas will be minimized and watered when needed. Fuel burning equipment running times will be minimized. 	<ul style="list-style-type: none"> Construction equipment exhaust may cause temporary, short-term impact to local air quality. Potential for exposed soil and dust during construction. Open construction areas will be minimized and watered when needed. Fuel burning equipment running times will be minimized.
Terrestrial and Aquatic Environment	<ul style="list-style-type: none"> No impact to terrestrial or aquatic environment. 	<ul style="list-style-type: none"> Replacement of 18 acres of old field vegetation with a wet detention basin, wetland plantings, and native prairie vegetation 	<ul style="list-style-type: none"> Replacement of 30 acres of golf course vegetation with a designed detention basin (open water), wetland and golf course vegetation
Wetlands	<ul style="list-style-type: none"> No impact to wetlands. 	<ul style="list-style-type: none"> Approximately 0.9 acres of wetland altered/ impacted 	<ul style="list-style-type: none"> No mapped wetlands on the site.
Threatened and Endangered Species	<ul style="list-style-type: none"> No impact to threatened and endangered species. 	<ul style="list-style-type: none"> No known threatened or endangered species on the project site. 	<ul style="list-style-type: none"> No known threatened or endangered species on the project site
Hazardous Materials	<ul style="list-style-type: none"> No impact to hazardous materials. 	<ul style="list-style-type: none"> Slight potential for hazardous materials from offsite properties (historic lumberyard located on southwest portion of the property. Evaluation determined contamination is unlikely. Hazardous materials are unlikely to be encountered. If encountered proper handling will occur. 	<ul style="list-style-type: none"> No impact to hazardous materials is anticipated.
Zoning and Land Use	<ul style="list-style-type: none"> No impacts to zoning or land use. 	<ul style="list-style-type: none"> Existing site is zoned residential and commercial. 	<ul style="list-style-type: none"> No impact to current zoning.

**Table 3-2
 Alternatives Comparison Summary**

B. Potential Impacts	Alternative 1 – No Action Alternative	Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)	Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion
Visual Resources	<ul style="list-style-type: none"> No impacts to visual resources. 	<ul style="list-style-type: none"> Existing building and parking lot will be removed. Site will be restored with vegetation and change to current visual resources will be minimal. Short-term impact may occur during construction as a result of equipment and material stockpiles at the site. 	<ul style="list-style-type: none"> Short-term impact may occur during construction as a result of equipment and material stockpiles at the site.
Noise	<ul style="list-style-type: none"> No additional noise generated. 	<ul style="list-style-type: none"> Temporary increase in noise levels during construction phase from equipment. Project must comply with Oshkosh City Ordinance for Excessive Noise. No long term changes to current conditions 	<ul style="list-style-type: none"> Temporary increase in noise levels during use of construction equipment. Project must comply with Oshkosh City Ordinance for Excessive Noise. No long term changes to current conditions
Public Service and Utilities	<ul style="list-style-type: none"> No impact to public service and utilities. Continued flooding may impact utilities and result in temporary disruption of services. 	<ul style="list-style-type: none"> No construction phase, or long-term, impacts to utilities or public services. Reduction in flooding will result in less disruption of public service and utilities. 	<ul style="list-style-type: none"> No construction phase, or long-term, impacts to utilities or public services. Reduction in flooding will result in less disruption of public service and utilities.
Traffic and Circulation	<ul style="list-style-type: none"> No changes to traffic. Flooding would continue to cause road closures and traffic delays. 	<ul style="list-style-type: none"> Reduction in street flooding following construction. Increase in traffic due to construction. Contractor required to develop and follow a traffic plan. Improved traffic flow in flood-prone areas after construction 	<ul style="list-style-type: none"> Reduction in street flooding following construction. Increase in traffic due to construction. Contractor required to develop and follow a traffic plan. Improved traffic flow in flood-prone areas after construction
Environmental Justice	<ul style="list-style-type: none"> Executive Order 12898 is not applicable to this alternative. 	<ul style="list-style-type: none"> There are no concentrations of minority or low-income populations in the project area or the downstream flood protection area. Project would not impact these populations. 	<ul style="list-style-type: none"> There are no concentrations of minority or low-income populations in the project area or the downstream flood protection area. Project would not impact these populations.

Table 3-2 Alternatives Comparison Summary			
B. Potential Impacts	Alternative 1 – No Action Alternative	Alternative 2 – Armory Area Stormwater Detention Basin (Proposed Action)	Alternative 3 – Westhaven Golf Course Detention Basin & Storm Sewer Diversion
Safety and Security	<ul style="list-style-type: none"> • Potential existing safety risks would continue to occur from on-going flooding problems. • No construction associated safety or security concerns would occur. 	<ul style="list-style-type: none"> • Project would reduce safety risks associated with on-going flooding. • Safety measures are incorporated into detention basin design. • Safety risks associated with construction activities would be mitigated by using qualified personnel and appropriate safety standards. 	<ul style="list-style-type: none"> • Project would reduce safety risks associated with on-going flooding. • Safety measures are incorporated into detention basin design. • Safety risks associated with construction activities would be mitigated by using qualified personnel and appropriate safety standards.
Historic Structures	<ul style="list-style-type: none"> • No historic structures would be disturbed or impacted. 	<ul style="list-style-type: none"> • No impacts to historic structures are anticipated. 	<ul style="list-style-type: none"> • No impacts to historic structures are anticipated.

4.0 Cumulative Impacts

Cumulative impacts are effects on the environment that result from the Proposed Action when added to past, present, and future actions. Cumulative impacts may result from individually minor actions, which when added together result in greater impacts over a period of time.

No cumulative impacts are expected as a result of this project. The proposed project will reduce flooding of streets and buildings in developed areas downstream of the project. The Proposed Action will not allow for the creation of added developments or new projects, which will increase flooding or other negative environmental impacts. The City of Oshkosh has strict stormwater management regulations, which require development sites to implement flood control and stormwater management practices to mitigate the increase in flooding and stormwater pollution from the development.

In addition to the proposed Armory Area Stormwater Detention Basin, the City of Oshkosh is in various stages of implementing other stormwater management practices throughout the City. The projects vary in size and scope, and are in various stages of planning and design. Each project provides flood relief benefits and some projects also reduce stormwater pollution. There are three additional projects within the Campbell Creek and Sawyer Creek watersheds. They are:

- Westhaven Clubhouse Area Detention Basin and Storm Sewer Improvements (completed in fall, 2011).
- 9th & Washburn Area Detention Basin and Maricopa Drive Relief Sewer (scheduled for construction in 2014).
- James Road Detention Basin (scheduled for construction in 2012).

These projects are located in an area (the Sawyer Creek watershed) which during larger flooding events stormwater flows into the Campbell Creek watershed and causes additional flooding problems. These projects will reduce flooding in the Sawyer Creek watershed, as well as reduce stormwater flows into the Campbell Creek watershed.

All future stormwater management projects will be required to comply with local, state, and federal rules and regulations. By complying with these regulations cumulative impacts to the environment, such as loss of open space or wetlands, will be avoided. Each future project will also be evaluated by a detailed hydrologic and hydraulics analysis to ensure that the project provides flood reduction benefits and there are no unintended flooding consequences. Based on these factors there are no cumulative impacts to occur from this project.

5.0 Public Participation

During the process of developing the concept for the Armory Area Stormwater Detention Basin project the City of Oshkosh Staff provided updates to the Common Council at public meetings. At these meetings, the public was provided the opportunity to make comments.

A 30-day public review period for this document was held. A public notice regarding the public comments period and the availability of the document was published in the Oshkosh Northwestern on XXXX. The draft EA was available for review at XXXX. The draft EA was also published at the FEMA website: XXXX. A copy of the published notice is included in Appendix F. The public was given the opportunity to comment on the project from XXXX to XXXX.

At the end of the public comment period a summary of all comments received will be incorporated into this section and copies of the comments will be placed in Appendix G.

6.0 Mitigation Measures and Permits

The following permits will be required for the implementation of the proposed Armory Area Stormwater Detention Basin:

1. A Wisconsin Pollution Discharge Elimination System (WPDES) permit for construction site stormwater Runoff issued by the WDNR.
2. A Chapter 30 Wetlands and Waterways permit issued by the WDNR.
3. A Section 404 Permit issued by the USACE.

The City of Oshkosh will follow all local, state, and federal rules and regulations that pertain to the proposed project. The City will also obtain all applicable permits prior to commencing work at the proposed site. If permit conditions change the scope of work for the project, it will be submitted to FEMA for additional review.

These mitigation measures will be followed for the implementation of the Proposed Action:

1. Appropriate construction BMPs will be implemented to minimize soil erosion. The measures will be implemented, installed, and maintained as required by the WPDES Permit and meeting City of Oshkosh erosion control standards. The measures may include, but are not limited to, minimizing the disturbed area, maintaining vegetative cover, inlet protection, stabilized construction entrances, silt fence, and erosion mat.
2. Measures will be taken to reduce the potential for temporary air quality impacts during construction including, keeping fuel-burning equipment running time to a minimum, minimizing open construction areas, and watering open construction areas to control dust when necessary.
3. To mitigate for potential impacts to the terrestrial and aquatic environment, native vegetation will be planted throughout the detention basin. Plant species tolerant of the various conditions surrounding the detention basin will be incorporated into the design. An open pool of water will also be incorporated into the detention basin design. These features will provide habitat for various wildlife such as water fowl, amphibians, small mammals, and migratory bird species.
4. If hazardous materials are encountered during construction, materials will be handled and disposed of in accordance with all applicable rules and regulations.
5. The proposed project must comply with Oshkosh City Ordinance Chapter 15, Health, Article V, Excessive Noise which defines allowable hours of construction and noise levels at property boundaries.
6. The detention basin will incorporate several safety features into the design. These features include: tall vegetation to discourage people from approaching the detention basin, a safety

shelf surrounding the pool, and the installation of grates over the inlet and outlet storm sewers.

7. To minimize the risks to safety and human health, all construction activities will be performed using qualified personnel trained in the proper use of the appropriate equipment including all appropriate safety precautions; additionally, all activities would be conducted in a safe manner in accordance with the standards specified in the OSHA regulations.
8. Equipment will be maintained in good working order to minimize noise and pollution.
9. If any human or archeological remains are encountered during construction, work at the site would be stopped immediately and FEMA and the Wisconsin SHPO would be contacted immediately.
10. If deviations from the proposed scope of work result in substantial design changes, the need for additional ground disturbance, additional removal of vegetation, or in any other unanticipated changes to the physical environment, the Grantee must contact FEMA, and a re-evaluation under NEPA and other applicable environmental laws will be conducted by FEMA.
11. The applicant is responsible for obtaining and complying with all required local, State and Federal permits and approvals.
12. No spoil material removed from detention basin may be stored or disposed of in a regulated floodplain or wetland area.

7.0 Consultations and References

The following agencies were consulted during the preparation of this EA:

Federal, State, City, and Local Agencies Consulted

Federal Emergency Management Agency
Wisconsin Emergency Management Agency
Wisconsin Department of Natural Resources
Wisconsin Historical Society
United States Fish and Wildlife Service
City of Oshkosh

Tribal Agencies Contacted

Ho-Chunk Nation; Black River Falls, WI
Winnebago Tribe of Nebraska; Winnebago, NE

References:

AECOM Report: *Armory Detention Basin Hydrologic & Hydraulic Analysis*. October, 2010.

AECOM Memo Report: *Environmental Review of Historical Records for the Proposed Armory Detention Basin, Oshkosh, Wisconsin*. April, 2011.

Bates Soil & Water Testing Services, LLC.: *Wetland Determination & Delineation Report for the Proposed Armory Area Detention Basin, City of Oshkosh, Winnebago County*, February, 2012.

Earth Tech Report: *City of Oshkosh Citywide Stormwater Management Plan and Ordinance Development*. December, 2008.

Strand Associates Report: *Campbell Creek Stormwater Management Plan, Addendum 1*, February 2008.

US Census Bureau website: <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>
Visited 8/4/2011.

USEPA; Air Quality website: <http://www.epa.gov/oaqps001/greenbk/> Visited 8/3/2011.

USDA NRCS Soils website: <http://websoilsurvey.nrcs.usda.gov/app/> Visited 8/3/2011.

WDNR *Upper Fox River Basin Summary Flyer* http://dnr.wi.gov/water/basin/upfox/upfox_flyer.pdf.

WDNR Wetland Inventory <http://dnrmaps.wi.gov/imf/imf.jsp?site=SurfaceWaterViewer.wetlands> Visited 10/31/2011.

8.0 List of Preparers

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