



Draft Environmental Assessment

***Metropolitan Government of Nashville and Davidson
County***

Dry Creek Wastewater Treatment Plant Facility Repairs

PA-04-TN-1909-PW-05597(5)

Nashville, Davidson County, Tennessee

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**U.S. Department of Homeland Security
Federal Emergency Management Agency Region 4
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LIST OF ACRONYMS

ACM	Asbestos Containing Materials
APE	Area of Potential Effects
ARAP	Aquatic Resource Alteration Permit
Barge	Barge Design Solutions
BG	Block Group
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
CAA	Clean Air Act
CAG	Community Advisory Group
CARTA	Chattanooga Area Regional Transportation Authority
CEQ	Council of Environmental Quality
CFC	Chlorofluorocarbons
CH ₄	Methane
CHA	Chattanooga Housing Authority
CL	Clays
CL-ML	Silty Clay Loams
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COPD	Chronic obstructive pulmonary disease
CSO	Combined Sewer Overflow
CT	Census Tract
CWA	Clean Water Act
DCWRF	Dry Creek Water Reclamation Facility
EA	Environmental Assessment
ECS	Existing Conditions Score
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act of 2007
EO	Executive Order
ESA	Endangered Species Act
FAC	Facultative
FACW	Facultative Wetland
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FRP	Fiber-reinforced plastic

LIST OF ACRONYMS **CONTINUED**

GBS	Green Building Standards
GHG	Greenhouse Gas

GHGRP	Greenhouse Gas Reporting Program
HFC	Hydrochlorofluorocarbons
HMP	Hazard Mitigation Proposal
HUD	Housing and Urban Development
IPaC	Information for Planning and Consultation
LWD	Large Woody Debris
MBTA	Migratory Bird Treaty Act
MCM	Menu of Control Measures
MGD	Million Gallons Per Day
ML	Silt loams
MOA	Memorandum of Agreement
MWS	Metro Water Services
N ₂ O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
PFCs	Perfluorocarbons
NHD	National Hydrology Dataset
NHPA	National Historic Preservation Act of 1966
NMFS	National Marine Fisheries Service
NO ₂	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	National Resources Conservation Service
NRI	National Risk Index
NSR	Nonattainment
NWF	National Wildlife Federation
NWI	National Wetland Inventory
NWP	Nationwide Permit
O ₃	Ozone
OEHP	Office of Environmental Planning & Historic Preservation
Pb	Lead
PFC	Hydrofluorocarbons
PM	Particle Pollution
PSD	Prevention of Significant Deterioration

LIST OF ACRONYMS
CONTINUED

PUMA	Public Use Microdata Area
PVC	Polyvinyl chloride
RAD	Rental Assistance Demonstration

RFO	Regional Field Office
SF ₆	Sulfur hexafluoride
SHPO	State Historic Preservation Office
SO ₂	Sulfur Dioxide
SQT	Stream Quantification Tool
TDAQ	Tennessee Department of Air Quality
TDEC	Tennessee Department of Environment and Conservation
TDOA	Tennessee Division of Archeology
THC	Tennessee Historical Commission
TNC	The Nature Conservancy
TN-IPC	Tennessee Invasive Plant Council
TOYR	Time of Year restriction
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
U.S.	United States
USACE	United States Army Corps of Engineers
USCB	United States Census Bureau
USCS	United States Soil Classification System
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WSS	Web Soil Survey
WWC	Wet Weather Conveyance

1.0 INTRODUCTION

The Federal Emergency Management Agency's (FEMA's) mission is to help people before, during and after disasters.

The Nashville Metro Area experienced a catastrophic severe storm, flooding, straight-line winds, and tornado event during the period of April 30 to May 18, 2010, which resulted in a total of 13.57 inches of rainfall, surpassing the previous rainfall record of 6.68 inches. On May 4, 2010, President Obama declared a major disaster declaration (FEMA-DR-1909-TN) for the state of Tennessee including federal assistance for Individual Assistance, Public Assistance, and Hazard Mitigation for 52 counties. This assistance was provided pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), and Public Law (PL) 93-288, as amended. Section 406 of the Stafford Act authorizes FEMA's Public Assistance (PA) Program to repair, restore, and replace state and local government and certain private nonprofit facilities damaged as a result of the event.

As a result, the City of Nashville's Metro Water Services (MWS) Dry Creek Water Reclamation Facility (Facility) sustained considerable damage. The site was almost completely inundated by floodwaters, including the majority of the plant's electrical distribution system, the entire tunnel system, and process buildings throughout the plant area (Appendix A, Figure 1). Five electrical unit substations and seven area motor control centers were submerged and sustained major damage, along with the associated instrumentation and control panels. Sixty-eight pumps in the tunnels and over one hundred pumps overall were submerged and sustained mechanical and electrical damage. Over 250 instruments used for monitoring and process automation were submerged and required replacement. Thirty-five variable frequency drives, ranging from 2 to 300 horsepower, were also submerged, and required replacement. During and after the May 2010 flood, the Facility was unable to provide wastewater treatment for almost two months.

With financial assistance from FEMA, the damage has been repaired and the Facility is fully functional. However, to further mitigate damages from future flood events, MWS has prepared a flood mitigation plan that features a floodwall designed to protect the Facility from future flood events up to a 1 in 500-year flood or the 0.2% annual chance of flooding. MWS is seeking funding from FEMA to implement the flood mitigation plan. This action triggers the need for the project to undergo a National Environmental Policy Act (NEPA) review. Specifically, constructing the floodwall would impact Dry and Grizzard Creeks, perennial tributaries of the Cumberland River, that flow through the Project Site. Possible adverse environmental impacts to these creeks resulting from constructing the floodwall and related structures are discussed in this Environmental Assessment (EA).

This EA has been prepared in accordance with Section 102 of the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality's (CEQ's) NEPA Implementing Regulations (40 CFR Part 1500-1508)¹, DHS Directive 023-01- 01, DHS Instruction 023-01-001-01, FEMA Directive 108-1, and FEMA Instruction 108-1-1. As a federal agency FEMA is required to comply with all NEPA, the CEQ regulations, and all other applicable laws and regulations. To achieve this level of compliance, FEMA is required to consider potential environmental impacts before funding or approving actions and projects. By preparing this EA, FEMA has analyzed the potential environmental impacts associated with the alternatives described in this EA.

2.0 PURPOSE AND NEED

The purpose of this action is for the Facility to implement a flood mitigation plan that reduces the flood risk and potential loss of life and property from further weather events.

As a result of the damage caused by floodwaters from the May 2010 flood, the Facility was unable to comply with its National Pollutant Discharge Elimination System (NPDES) permit for a period of 50 days. At the time of the flood, the Facility served approximately 112,000 people from northeastern Davidson County and portions of Sumner County and was unable to provide wastewater treatment (Metro Water Services, 2013). The City of Nashville has a significant investment in the Facility and relocating the Facility to an upland area is not feasible. Thus, a flood mitigation plan was developed to prevent floodwaters from impacting the Facility and potentially rendering it inoperable.

Because MWS is requesting financial support from FEMA, approval of the project is contingent on completing an EA to examine alternatives that will avoid, minimize, or mitigate adverse impacts.

3.0 PROJECT LOCATION AND BACKGROUND

The Facility is located at 61 Edenwold Road, Nashville, Davidson County, Tennessee 37115 (latitude 36.288641, longitude -86.680731). It is north of Northgate Business Park, south of the CSX Railroad tracks and Edenwold Road, and east of Myatt Drive (Appendix A, Figure 2). The Project Site (latitude 36.287472, longitude -86.689054) is mostly on Davidson County Property Appraiser parcel 03411002400, owned by Metro Nashville Government, but also includes small

¹ Consistent with E.O. 14154, CEQ has rescinded the NEPA regulations, effective April 11, 2025, and is working with Federal agencies to revise or establish their own NEPA implementing procedures. Per CEQ Guidance, while revisions are ongoing, agencies should continue to follow their existing practices and procedures implementing NEPA and can voluntarily rely on the regulation in 40 CFR 1500-1508 in completing ongoing NEPA reviews (Implementation of the National Environmental Policy Act, February 19, 2025).

portions of parcels 03411003300 and 03411003400, owned by Dustin Henly and Randall Wherry, respectively. Access to the Facility and Project Site will be from Edenwold Road. The City of Nashville, Tennessee, is located approximately 12 miles south of the site.

The Facility and Project Site were historically pastureland and, in the 1990s, portions were used as a borrow pit area for the surrounding development. Construction of the Facility began in 1961. Over time, land use surrounding the Project Site has changed from undeveloped to commercial and light industrial. The area from the northeast to the west and south is now heavily developed. The closest residential community, Harbor Village, located to the northeast, began development in the late 1980s. To the east is the Cumberland River.

Dry and Grizzard Creeks flow through the Project Site. Currently, Dry Creek is incised with no floodplain connection and is eroding throughout the majority of the Project Site. The stream does not have a riparian buffer on the northern bank. Grizzard Creek is extremely incised and entrenched with no floodplain connection and is eroding throughout most of the Project Site. The stream has a minimal riparian buffer on each side.

A 1967 aerial photo of the Facility shows the land on the left side of Dry Creek as being steeply sloped and with a few trees growing along the banks of the creek. On the right side, the land appears flat with some trees growing along the creek bank.

The May 2010 flood of the Project Site and vicinity resulted in MWS developing a flood mitigation plan to reduce damage to the Facility from future flood events.

4.0 ALTERNATIVES

This chapter explains the rationale for identifying the alternatives to be evaluated, including the No Action Alternative required by NEPA. It also describes each alternative, provides a comparison of alternatives with respect to their potential environmental impacts, and identifies the Preferred Alternative (Proposed Action). Alternatives that were determined to be not viable were eliminated from detailed analysis in this EA and briefly discussed below.

Alternative 1: No Action Alternative

Under the No Action Alternative, MWS would not construct the floodwall or take any other action to protect the Facility from future flooding. No existing physical, biological, water, cultural, and socioeconomic resources would be directly impacted. Erosion of the creek banks would continue and contribute to a decrease in ecological and hydrological functioning of Dry and Grizzard Creeks resulting in continued impacts to human and natural environment. Future flooding events may lead to damage to the Facility leading to socioeconomic and water resources impacts. The No Action

Alternative provides a baseline of conditions against which the impacts of the Proposed Action are measured.

Alternative 2: Proposed Action

Under the Proposed Action, MWS would construct a concrete floodwall around portions of the Facility that are not currently protected by existing structures and berms (Appendix A, Figure 3) to provide protection of the Facility from future flooding events. Some portions of the floodwall would be constructed in previously disturbed upland areas. Other portions of the floodwall would impact portions of Dry and Grizzard Creeks and require permits from the Tennessee Department of Environment and Conservation (TDEC) and the U.S. Army Corps of Engineers (USACE). Approximately 240 feet of Dry Creek would need to be filled to construct the floodwall. Additionally, approximately 205 feet of Grizzard Creek will need to be filled for proper installation of the panels. When designing the flood mitigation plan, MWS considered these impacts and the current low hydrological and ecological functioning of two creeks. This work will require the filled sections of the creeks to be relocated thus impacting water and biological resources (Appendix A, Figure 3).

MWS determined that creating the two new stream segments on relocated sites would improve the functionality of Dry and Grizzard Creeks and satisfy the mitigation required for relocating streams. Implementing this alternative would restore important aquatic resources by replacing the existing non-functioning stream sections with stable, functioning stream beds, reconnecting the stream sections to a more functional floodplain, restoring natural channel geomorphology (dimension, pattern, profile), restoring natural velocities, improving sediment transport, and reducing stream bank erosion. In-stream structures (i.e., wood and rock) will be introduced to increase lateral stability, aquatic habitat, and grade control. Increasing re-oxygenation zones, reducing sediment input, and providing shade will improve the overall water quality of the stream sections. Native riparian zones will be established throughout all reaches of the project and will provide shade, nutrient filtration, and wildlife habitat.

The channels will be relocated and designed using natural channel techniques including stable dimension, pattern, profile, and a functional floodplain bench, as well as a native riparian buffer. As a result of the relocation, numerous geomorphologic and hydraulic functions as well as in-stream habitat will improve.

The project will be completed in two phases. The first phase will be to create the relocated segments of Dry and Grizzard Creeks. Relocation of the two creek segments will commence once all required permits have been obtained. Relocation of Dry and Grizzard Creeks will consist of establishing new natural channel dimensions, patterns, and profiles that will promote a more defined meandering channel with proper pool-to-pool spacing and natural riffle-pool sequences

where applicable. Much of the work will be performed in the dry with the new channels being constructed prior to release of stream flow from the existing channels.

Work will begin at the upstream portion of the channels and continue downstream. Silt fencing, temporary crossings, and all other erosion and control measures will be placed to minimize erosion and runoff. Cobble and gravel from the existing stream channel will be removed and stockpiled to use in the new channel. The new stream channel will be rough graded, and the cobble, gravel, and other structures will be placed in the new channel. Following final grading of the new channel and installation of erosion and control matting along channel banks, the area will be planted with new vegetation, and flow from the original stream beds will be diverted to the relocated and restored stream beds.

Following the construction of the channel, MWS will monitor the restored channel and downstream of the project area annually for five years, and yearly reports will be submitted to TDEC and USACE. Data collected from the monitoring will be documented and serve as indicators to determine if the mitigation is developing into the desired condition. MWS also proposes to protect the restored channel and associated buffers in perpetuity with a conservation easement.

In the second phase the abandoned channels will be filled, the banks stabilized, and the concrete floodwall constructed. Utilizing concrete flood walls will meet the unique requirements of the project site. Concrete walls can be designed to the protection elevation of 439 in all areas to comply with Executive Order (EO) 11988 (EO, 1977a) and local floodplain criteria from the Nashville Multi-Hazard Mitigation Plan for critical action facilities. In some areas the concrete walls will be designed to be approximately 20' high from ground surface. In other areas, concrete walls will be designed to account for shallow bedrock. An example of a concrete flood wall design is provided in Appendix A, Figure 4.

The proposed floodwall will be built to an elevation of 436.8 feet above mean sea level (MSL) which is two feet higher than the flood record elevation of 434.8 feet. The actual height of the floodwall above ground level will vary from 9 to 20 feet. Existing equalization basins, aeration tanks, and primary clarifiers have perimeter walls that exceed the height of the proposed floodwall and thus will not require additional protection.

Alternatives Considered and Dismissed

When first considering how to address future flooding issues at the Facility, the perimeter flood wall and localized/limited flood protection measures were evaluated. The localized/limited protection measures considered included raising equipment, dry flood proofing, wet flood proofing, and walls and gates around individual buildings. Based on the complexity of protecting each of the different plant processes, the difficulty in accessing these localized protection measures

would require, and the tunneling system which connects most of the plant, limited flood protection measures were deemed infeasible.

With the understanding that a floodwall was the best option for protecting the Facility and that constructing the floodwall would impact portions of Dry and Grizzard Creeks, alternatives considered focused on how to build the floodwall by reducing or eliminating impacts to Dry and Grizzard Creeks. The following alternatives were considered but it was determined for the reasons stated below they are not feasible and thus were not carried forward for further consideration.

- **FRP Sheet Pile Flood Wall** - In conversations with the UltraComposite fiber-reinforced plastic (FRP) sheet piling manufacturer, they indicated the maximum wall height possible for cantilevered FRP sheet piles is 8 feet which would not meet the design protection elevation for the majority of the site. In areas where wall heights are 8 feet and under, rock is shallow. Due to these site conditions, FRP sheet pile floodwalls were determined to not be a viable option.
- **Steel Sheet Pile Flood Wall** - The maximum height wall possible for cantilevered steel sheet piles is approximately 12 feet. This has the same issues as FRP with shallow rock and not meeting the design height for flood elevation for large portions of the project site. Due to these requirements and site conditions, FRP sheet pile floodwalls were determined to not be a viable option.
- **Rip Rap** - Traditionally, riprap armoring is used as a low-cost measure to control erosion; however, due to the existing slopes there is not adequate space to install riprap without impacting upstream flood elevations. Riprap must be placed on a 2:1 slope. Since Dry Creek is approximately 20 feet deep, an adequate layer of riprap would extend into the channel bottom approximately 40 feet. This was not considered a viable alternative to MWS.
- **Gabion Baskets** - Based on the excavation requirements to install gabion baskets, they were determined to not be a viable option due to existing infrastructure which cannot be relocated.
- **Concrete Retaining Wall** - Another potential option is to dowel into bedrock and pour concrete.
- **retaining wall** and had similar issues to the gabion basket alternative with excavation requirements and was therefore determined to not be viable.

Impact Evaluation

As per the 40 CFR 1508.1(i)(4) definition of the term, Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial

and detrimental effects, even if on balance the agency believes that the effect will be beneficial. (See also 40 CFR 1508.1(i)(1-4)).

When possible, quantitative information is provided to establish potential impacts; otherwise, the potential qualitative impacts are evaluated based on the criteria listed in Table 4-1.

Table 4-1 Impact significance and context evaluation criteria for potential impacts

Impact Scale	Criteria
None/Negligible	The resource area would not be affected and there would be no impact, OR changes or benefits would either be non-detectable or, if detected, would have effects that would be slight and local. Impacts would be well below regulatory standards, as applicable.
Minor	Changes to the resource would be measurable, but the changes would be small and localized. Impacts or benefits would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate	Changes to the resource would be measurable and have either localized or regional scale impacts/benefits. Impacts would be within or below regulatory standards, but historical conditions would be altered on a short-term basis. Mitigation measures would be necessary, and the measures would reduce any potential adverse effects.
Major	Changes to the resource would be readily measurable and would have substantial consequences/benefits on a local or regional level. Impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce impacts, though long-term changes to the resource would be expected.

The impact analysis in this EA evaluates the potential environmental direct and indirect impact of the No Action and Proposed Action alternative. A summary table of the potential impacts of the No Action and Proposed Action alternative is provided in Table 4-2. Table 4-3 lists the Resource Areas that were eliminated from the EA and the reason for deleting them.

Table 4-2 Summary and Comparison of Alternatives by Resource Area

Area of Evaluation	Alternative 1: No Action	Alternative 2: Proposed Action	Environmental Protection Measures and Required Permits
Geology and Soils	Minor	Minor	Implement best management practices (BMPs) to control erosion.
Air Quality	None	Minor	Project construction and equipment-generated fugitive dust would be controlled using standard construction BMPs, including watering of exposed surfaces and enclosing or covering of stockpile material. No permitting anticipated.
Visual Quality and Aesthetics	None	Minor	If necessary, plant new native vegetation to reduce visual impacts and install visual barriers during the construction phase.
Water Quality	Minor	Minor, beneficial	Impact to water quality would be controlled by using BMPs such as silt fencing to reduce runoff. Appropriate permits would be obtained prior to the start of construction. All permit conditions would be adhered to. Expected permits include TDEC State 401 Individual Water Quality Permit, TDEC Aquatic Resource Alteration Permit (ARAP)/§401 Water Quality Certification, USACE Section §404 Nationwide Permit 27, and a TDEC NPDES Permit.
Floodplains	Moderate	Minor, beneficial	Implement erosion and sediment control BMPs.
Wetlands	N/A	N/A	No wetlands are present in the project footprint.
Wildlife and Fish	Negligible	Minor, beneficial	Educate contractors on rules and regulations that protect wildlife.
Vegetation	None	Minor, beneficial	If needed, dispose of vegetation removed during construction in an approved landfill. Adhere to any local tree clearing or protection requirements that would apply to the Project Site.

Area of Evaluation	Alternative 1: No Action	Alternative 2: Proposed Action	Environmental Protection Measures and Required Permits
T & E Species	None	Minor	Conduct informal consultation with USFWS on listed species. Adhere to any conditions relating to listed species provided by USFWS. Contact USFWS if any listed species are found or seen in the Project Site.
Migratory Birds	None	Minor	To the extent practicable, conduct tree clearing outside of the peak breeding season for migratory birds.
Historic Structures	None	None	No historic structures are within the Project Site.
Archaeological Resources	None	None	No archaeological structures are within the Project Site.
Land Use & Planning	None	Minor	The current land use will remain the same.
Noise	None	Minor	Noise levels will be elevated during daylight hours. Impacts will be temporary and last only during construction.
Transportation	None	Minor	No roads exist within the Project Site.
Public Services & Utilities	None	Minor	No utility or services will be impacted.
Public Health & Safety	None	Minor	Contractor will follow all OSHA regulations.
Hazardous Materials	None	Minor	Follow BMPs for handling, storing, and disposing of hazardous materials

Table 4-3 Resource Areas not Impacted

Area of Evaluation	Reason
Coastal Resources	There are no coastal resources in Davidson County, TN.
Essential Fish Habitat	There is no marine/estuarine Essential Fish Habitat in Davidson County, TN.
Wild and Scenic Rivers	Neither Dry Creek, Grizzard Creek, nor the segment of the Cumberland River in Davidson County, TN, is designated as Wild and Scenic Rivers.
Safe Drinking Water Act	Dry Creek and Grizzard Creek empty into the Cumberland River upstream of MWS's two water treatment facilities, 8.4 and 20.2 river miles downstream. Flow from these two creeks will not have an impact on drinking water.

5.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

This chapter describes the existing environmental, social, and economic conditions of the proposed Project Site and the surrounding areas that might be affected if the No Action or Proposed Action Alternative is implemented. This chapter also describes the potential environmental effects that could result from implementing the Proposed Action. This EA uses the guidance in 40 CFR § 1501.3, to determine whether an adverse effect of the Proposed Action is significant,

5.1 PHYSICAL RESOURCES

5.1.1 Geology and Soils

FEMA uses departments such as the U.S. Department of Agriculture (USDA) and U.S. Geological Survey (USGS) to determine the current conditions of the site in question and to determine if any specific mitigation measures or significant potential impacts may occur at the site. This helps to analyze support efforts during emergencies such as flooding events, tornadic outbreaks, or earthquakes.

5.1.1.1 Existing Conditions

The project is in the northwest portion of the outer Central Basin physiographic province of Tennessee. The Central Basin is an ovoid geologic and topographic feature approximately 80 kilometers (km) (50 miles) wide and 129 km (80 miles) long. The Nashville (Central) Basin lies

on the geologic formation known as the Nashville Dome and is composed mostly but not exclusively of middle and upper Ordovician age materials. The geology of northwestern Davidson County is typical of the Central Basin in Tennessee. The area is underlain primarily by the Fort Payne, Hermitage, Bigby-Cannon, and Leipers and Catheys Formations. The Nashville Basin is an erosional remnant that has been most eroded at its center (inner basin) with less weathering around the periphery. Topography becomes more undulating toward the Highland Rim. The Highland Rim surrounds the Central Basin and is typically 500–600 feet higher in elevation. West of the Area of Potential Effect (APE), the Highland Rim is demarcated by Backbone Ridge, which also divides the less fertile “Barrens” from more fertile soils in the outer Basin. In the Central Basin, the topography is rolling and characterized by ridges and hills dissected by small to large streams.

The Leipers formation consists of limestone that is fossiliferous and argillaceous, thin bedded and nodular, has thin shale partings, and is medium dark gray to brownish gray in color. The Catheys formation consists of limestone that is argillaceous, nodular, and silty, fine-grained, with thin-bedding and medium dark gray to brownish gray in color. This rock formation is approximately 200 feet thick.

The site consists of several soil types typical to the area (Appendix A, Figure 5). The soil types include:

- Arrington Silt Loam (Ar) – occasionally flooded, well drained, consists of fine-grained alluvium derived from limestone and siltstone.
- Lindell silt loam (Ld) – occasionally flooded, moderately well drained, consists of fine-loamy alluvium derived from limestone and siltstone.
- Armour Silt Loam (AmB) – well drained, silty alluvium over clayey residuum weathered from phosphatic limestone.
- Minmosa-Urban Land complex (MsD) – well drained, clayey residuum weathered from limestone.

The proposed floodwall will require the relocation of segments of Dry and Grizzard Creeks. The Dry Creek relocation will include placing fill within the existing creek channel and, to construct the floodwall, excavating to depths between 15 and 25 feet below the existing ground surface. The Grizzard Creek relocation will be constructed in a similar fashion with maximum excavation for the panels as deep as 40 feet along the new creek alignment.

The ground surface where the floodwall would impact Dry Creek generally slopes down towards the east, with elevations ranging from about 419 feet (east end) to 439 feet (west end) above MSL. This segment of the floodwall will impact approximately 240 linear feet of habitat within Dry Creek and its floodplain. The area adjacent to the creek is heavily wooded with some grass areas

within the plant. Ground surface elevations range from about 390 feet to 425 feet above MSL along this reach.

The ground surface where the floodwall would impact Grizzard Creek slopes down towards the east, from an elevation of approximately 437 MSL near the Facility to an elevation of approximately 420 MSL at the creek over a distance of 20 feet. The steep slope along Grizzard Creek and the depth below ground needed to place the floodwall panels requires placing fill in approximately 205 feet of Grizzard Creek.

A geotechnical exploration was conducted over three periods: June 25-July 22, 2021, May 5, 2022, and June 22, 2022, and the report was issued on August 4, 2022 (Appendix B, Document 1). The purpose of this work was to evaluate the stability and seepage conditions for the planned floodwall. During the investigation, a total of 35 test borings were conducted across the Project Site. The borings were analyzed for their composition of soils, depth of the bedrock layer, the presence/absence of groundwater, and technical laboratory-based analyses of the borings. The test borings did not encounter measurable groundwater that would require dewatering.

5.1.1.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the site would remain undisturbed, and the soils and general geology of the area would not be disturbed. Any potential flooding events would affect the Facility and surrounding areas. The area where both Dry Creek and Grizzard Creek are located would continue to degrade and erosion and sediment movement would continue to worsen over time.

Alternative 2: Proposed Action

No significant adverse impacts to the geology and soils will result from implementing the Proposed Action. While construction of the floodwall will result in permanent impacts to the existing geology and soils, the impacts are minor in comparison to the large area of similar geology and soil composition. Based on the exploration and laboratory testing completed, the soils present along the floodwall alignments consist of an upper layer of lean clay fill underlain by native lean clay to the bedrock surface. Geotechnical models were used to determine if the existing topography and existing soils would be sufficient to support the floodwall panel under flooding and non-flooding conditions. Details of these studies are in Appendix B, Document 1. The report provides recommendations on how to support the panels so they would survive a flooding event, a general process for preparing the site including a recommendation to muck the creek segments that will be relocated, and the type of fill and compaction needed to support the panels. MWS would implement best management practices (BMPs) to minimize impacts.

5.1.2 Air Quality

The Clean Air Act (CAA) (42 U.S.C. §7401 et seq.) and the U.S. Environmental Protection Agency (USEPA) have established and regulate the nation's air quality. The purpose is to ensure and protect public health and welfare concerning air quality. The USEPA established National Ambient Air Quality Standards (NAAQS) for six pollutants: ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, lead, and particulate matter (which includes respirable particulates from 10-2.5 micrometers in diameter). The thresholds are further characterized into primary standards, which protect against health effects, and secondary standards, which protect against welfare effects such as damage to crops, vegetation, and buildings.

The CAA classifies the country into attainment and nonattainment areas, usually designated by county or metropolitan areas. Nonattainment is defined as any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for a NAAQS. Attainment is defined as any area (other than an area identified in clause) that meets the national primary or secondary ambient air quality standard for a NAAQS. Each state is required to have a plan outlining compliance with NAAQS and other components of the CAA through their State Implementation Plan.

Table 5-1 National Ambient Air Quality Standards

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3- month average	0.15 µg/m ³ ⁽¹⁾	Not to be exceeded
Nitrogen Dioxide (NO₂)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb ⁽²⁾	Annual mean
Ozone (O₃)		primary and secondary	8 hours	0.070 ppm ⁽³⁾	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	PM _{2.5}	primary	1 year	12.0 µg/m ³	Annual mean, averaged over 3 years

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
		secondary	1 year	15.0 µg/m ³	Annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m ³	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24 hours	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO₂)		primary	1 hour	75 ppb ⁽⁴⁾	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: USEPA website: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>

Notes:

µg/m³ = micrograms per cubic meter; AAM = annual arithmetic mean; mg/m³ = milligrams per cubic meter; ppm = parts per million

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.

(2) The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O₃ standards.

(4) The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a SIP call under the previous SO₂ standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Greenhouse gases emitted by both natural processes and human activities. When these gases are released at greater rates than then can be removed from the atmosphere, they begin to accumulate and can change atmospheric conditions. GHGs include water vapor, carbon dioxide, methane, nitrous oxides, and other compounds. The accumulation of greenhouse gases in the atmosphere can affect species distribution, temperature fluctuations, sea level dynamics, and weather patterns.

The following gases are components of GHGs:

- Carbon dioxide enters the atmosphere through burning fossil fuels, solid waste, trees, other biological materials, and as a result of certain chemical reactions, such as cement manufacturing. Carbon dioxide is absorbed and emitted naturally as part of the carbon cycle, through plant and animal respiration, volcanic eruptions, and ocean-atmosphere exchange.

- Methane (CH₄) is natural, and human activities produce methane. Most commonly, natural wetlands, agricultural activities, fossil fuel extraction and transport all emit methane.
- Nitrous oxide (N₂O) is produced through activities such as cultivation, fertilizers, fossil fuel combustion, nitric acid, and biomass burning.
- Fluorinated gases such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) are often used in coolants, foaming agents, fire extinguishers, solvents, pesticides, and aerosol propellants.

There is no classification system that measures the levels of GHGs at the national, state, or county level or provides an attainment/non-attainment system. The USEPA has established the Greenhouse Gas Reporting Program (GHGRP) (40 CFR Part 98) that requires all large GHG emission sources to report emission sources, fuel and industrial gas suppliers, and CO₂ injection sites across the United States. The minimum emissions a facility can either emit or supply (if all products that could release CO₂ were emitted at once) is 25,000 metric tons CO₂ per year. USEPA maintains the Facility Level Information on Greenhouse Gases Tool (FLIGHT) (EPA, 2022.). FLIGHT data consists of mandatory reports of GHGs emitted from large facilities in the U.S.

5.1.2.1 Existing Conditions

Air quality is under the jurisdiction of the USEPA and the Tennessee Department of Air Quality (TDAQ). The Project Site is in Davidson County which is classified as a NAAQS attainment area.

5.1.2.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would have no effect on air quality or GHG emissions. GHG emissions will not change if no action is taken unless factors not related to the project result in changes to GHGs.

Alternative 2: Proposed Action

Construction of the Proposed Action would result in minor short-term construction-related impacts to air quality primarily from the exhaust from equipment and fugitive dust. The construction would involve using diesel-powered machinery that would create small amounts of airborne dust and debris and temporary increases in air pollutants. The emissions include carbon monoxide, nitrogen oxides, and sulfur dioxide, resulting in a slight localized increase of GHGs during construction.

Emissions from construction activities would be limited or minimized by the contractor properly maintaining equipment, implementing dust control measures, and using ultra-low sulfur diesel fuel as required by the Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel

Rule (EPA, 2004). Emissions are expected to remain below de minimis levels. Construction activity would be temporary and, by implementing BMPs, impacts on air quality would be minimal, short-lived, and would not result in a change to the County's attainment status. Once the floodwall is constructed and the stream segments are relocated, the Project Site will not produce any new sources of air pollution or GHGs.

5.1.3 Visual Quality and Aesthetics

Visual resources include natural and constructed features that give aesthetic qualities to a particular environment. Landforms, water surfaces, and vegetation are the primary components that characterize undeveloped landscapes. Buildings, fences, and streets are considered constructed elements which may also be visible. Attributes used to describe an area's visual resource value include significant views, landscape character, perceived aesthetic value, and uniqueness.

Constructed features are more prominent in developed areas. The visual character of a developed area encompasses size, forms, materials, and functions of buildings, structures, roadways, and infrastructure, along with surrounding landscape features. Visual quality can be regulated by urban areas or developments by ordinances, standards, or design guidelines for achieving or protecting visual quality. In undeveloped areas, scenic quality is protected in some designated areas by laws such as the National Wild and Scenic Rivers Act and federal land management regulations.

5.1.3.1 Existing Conditions

Visual resources are very important to people living in and travelling through an area. The Project Site is located directly south and east of the Facility on undeveloped land consisting of Dry Creek, Grizzard Creek, and a wooded floodplain of the Cumberland River. The areas to the north and south are primarily commercial and light industrial. There is a wooded area west of the Project Site that separates the view of the Project Site from Myatt Drive. To the east is the Cumberland River. The Project Site is not visible from any of the nearby residences. People in a few of the buildings in the Northgate Industrial Park to the south of the Project Site will notice some construction activity in the Dry Creek area but the floodwall will not be visible to anyone looking at the site due to being hidden by existing vegetation.

5.1.3.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would not result in a change in current conditions. There would be no impact to visual resources.

Alternative 2: Proposed Action

Implementing the Proposed Action will not result in significant adverse impacts to the visual quality and aesthetics visible to the public. Construction of the Project would convert some wooded

land within the existing floodplain to a new stream bed. However, this work and construction of the floodwall will be mostly unnoticed due to the Project Site being bordered by wooded areas that will block view of the work. Depending on the amount of clearing done to relocate Dry Creek, the viewshed from the rear of three or four commercial/light industrial properties along Northgate Business Parkway may see some construction activity. These visual impacts would be minor and, with the planned replanting of the Project Site, would eventually become unnoticeable. Depending on the locations of the laydown areas, stockpiles of materials, onsite construction vehicles, and employee parking may be visible during construction. These impacts would be temporary and would cease upon the completion of construction activities. Overall, the appearance of the area will be similar to that of the commercial/light industrial developments surrounding the site.

5.2 WATER RESOURCES

5.2.1 Water Quality

Congress enacted the Federal Water Pollution Control Act in 1948 which was later reorganized and expanded in 1972 and became known as the Clean Water Act (CWA) (33 U.S.C. Section 1251 et seq.). The CWA regulates discharge of pollutants into water with sections falling under the jurisdiction of USACE and USEPA. Section 404 of the CWA establishes the USACE permit requirements for discharging dredged or fill materials into Waters of the United States and traditional navigable waterways. USACE regulation of activities within navigable waters is also authorized under the 1899 Rivers and Harbors Act. Under the NPDES permitting process, the USEPA regulates both point and non-point pollutant sources, including stormwater and stormwater runoff. Activities that disturb one acre of ground or more are required to apply for an NPDES permit, through TDEC as authorized by USEPA. This Section 401 water quality certification is required when obtaining a CWA 404 Permit.

5.2.1.1 Existing Conditions

The Project Site falls within the Interior Plateau (71) Tennessee ecoregion and is further categorized into the Dry Creek Basin (71) sub-ecoregion region of Tennessee. The Project Site is within the Goodlettsville, Tennessee, topographic quadrangle (Appendix A, Figure 6), and the property is located within the Dry Creek-Cumberland River (051302020302) lower HUC-12 watershed, within the Lower Cumberland-Sycamore HUC-8 watershed (05130202), which is within the Cumberland River Basin (Appendix A, Figure 7).

Two streams, Dry and Grizzard Creeks, and two wet weather conveyances (WWCs) were identified within the Project Site (Appendix A, Figure 8). Detailed descriptions of these creeks and WWCs are provided in Appendix B, Document 2. Both streams were assessed for hydrology (runoff and stormwater infiltration into the ground), hydraulics (floodplain connectivity), and geomorphology (presence of woody debris, erosion rate, amount of riparian vegetation, and stream bed form diversity) using TDEC's Tennessee Stream Quantification Tool (SQT) (Tennessee

Department of Environment and Conservation, 2023). The Existing Conditions Score (ECS) for both streams was Non-Functional for hydraulics, hydrology, and geomorphology (Appendix B, Document 3).

There are limited data on the water quality in Dry Creek. The segment of Dry Creek from its confluence with the Cumberland River to CSX railroad bridge was listed as impaired by TDEC in 2022 for recreational use due to high levels of *Escherichia coli* but was not assessed for fish and aquatic life (Appendix B, Document 4). Upstream of this segment Dry Creek was considered impaired for fish and aquatic life and recreation based on 2022 data. There are no water quality data for Grizzard Creek, and the stream has not been classified by TDEC.

TDEC and USACE have confirmed the streams are jurisdictional but the WWCs are non-jurisdictional. In response to a November 21, 2022, application for a State 402 Individual Water Quality Permit, TDEC has issued an Aquatic Resource Alteration Permit (ARAP)/§401 Water Quality Certification to fill 1,080 feet of existing degraded streams and construct 780 feet of new stream channel using natural channel design on June 23, 2023 (Appendix B, Document 5). On August 19, 2022, MWS applied for a Nationwide Permit (NWP) 27 (Aquatic Habitat Restoration, Enhancement, and Establishment Activities) to relocate and restore portions of the highly degraded Dry and Grizzard Creeks. Approval of the NWP permit application is pending, and once determination from the USACE has been received, FEMA will be notified).

5.2.1.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

If no action is taken, the segments of Dry and Grizzard Creek will not be relocated and restored and there would be no impact to either stream. Water quality would not be improved. Further degradation of the riparian zone could result from continuing erosion of the stream banks. The TDEC Non-Functional ECS scores would not change.

Alternative 2: Proposed Action

Implementing the Proposed Action will not result in significant adverse impacts to water quality. Rather, implementing the Proposed Action will enhance water quality over time. The design of the relocated stream segments will provide new re-oxygenation zones and reduce sediment input, and the added vegetation will provide shade and improve the overall water quality of the stream reaches. The proposed approach will improve floodplain connectivity, bedform diversity, lateral stability, and riparian buffer width and restore natural channel geomorphology. The result of these actions is expected to improve water quality.

Connecting the proposed streams with their floodplain, increasing the entrenchment ratio, and reducing bank height ratio will lift the hydraulics function to “Functioning.” The ECS for Dry and

Grizzard Creeks will improve to “Functioning at Risk” for geomorphology and “Functioning” for hydraulics, but there will be no change for hydrology. Although the biology function was not assessed, the proposed in-stream habitat introduction and restored bedform diversity/riffle pool sequencing will allow aquatic species to move freely throughout the system and reclaim the biological integrity of the watershed. Native riparian zones will also provide wildlife habitat. All the aforementioned measures will restore and protect a portion of Dry Creek and Grizzard Creek, producing water quality and ecological benefits.

Site planning, design, construction, and maintenance strategies would be used to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology regarding the temperature, rate, volume, and duration of flow. This would require the implementation of an erosion and sedimentation control plan and appropriate construction stormwater BMPs. These measures would minimize the potential for indirect impacts to offsite surface waters.

5.2.2 Floodplains

EO 11988, Floodplain Management (EO 11988), amended January 29, 2015, and as implemented in 44 CFR Part 9, requires federal agencies to “avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.” (Office of the President, 1977). The 100- year floodplain is the area covered by water in the event of a 100-year flood, which is a flood that has a 1 percent annual chance of being equaled or exceeded in magnitude in any given year. The 500-year floodplain is the area covered by water in the event of a 500-year flood, which is a flood that has a 0.2 percent annual chance of being equaled or exceeded in magnitude in any given year. The 100- and 500-year floodplains are mapped on FEMA Flood Insurance Rate Maps (FIRMs).

Under 44 CFR Part 9.6, an 8-step decision making process must be completed for proposed actions taking place in a floodplain as required by EO 11988. The EO requires federal agencies (or a state agency implementing a federal funding program) to provide leadership and take action that reduces risk of flood loss, minimize impacts of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial functions of floodplains. Under this order, federal agencies should first look at avoiding all actions in or adversely affecting floodplains unless no practicable alternatives exist. If no practicable alternatives exist, then federal agencies must evaluate the potential effects of the proposed action. The Tennessee Emergency Management Agency (TEMA) administers and regulates the National Flood Insurance Program.

In addition, federal agencies are required to demonstrate that consideration of all practicable alternatives has resulted in the reduction or elimination of the long- and short-term adverse impacts associated with occupancy and modifications of the floodplain. This eight-step process includes assessing all practicable alternatives and incorporating public review. Projects located within the

Special Flood Hazard Area (SFHA) are subject to EO 11988. Information on where SFHAs are located is available on Flood Insurance Rate Maps (FIRMs) published by FEMA. FEMA uses engineering studies to determine the delineation of these areas or zones subject to flooding. The relevant data source for the SFHA is the latest issued FEMA data or guidance, which includes advisory data, such as Advisory Base Flood Elevations (ABFEs) or preliminary and final FIRMs.

The SFHA is the area that would be inundated by a 100-year flood: an area that has a one percent or greater chance of experiencing a flood in any single year (see definition of the term “Area of Special Flood Hazard”, 44 CFR § 59.1). SFHAs are shown on FIRMs as shaded areas labeled with the letter “A” or “V.”

- “V” zones are coastal flood hazard zones subject to wave run-up in addition to storm surge.
- “A” zones include all other special flood hazard areas.
- “VE” zones, “AE” zones, “V” zones, or “A” zones followed by a number are areas with specific flood elevations, known as Base Flood Elevations (BFEs).
- A zone with the letter “A” or “V” by itself is an appropriately studied flood hazard area without a specific flood elevation.
- Within an “AE” zone or a numbered “A” zone, there may be an area known as the “regulatory floodway,” which is the channel of a river and adjacent land areas which must be reserved to discharge a 100-year flood without causing a rise in flood elevations.

5.2.2.1 Existing Conditions

Currently, 680 linear feet of Dry Creek and 400 linear feet of Grizzard Creek, are located within the Project Site. Both creeks have a floodplain connection to the adjacent Cumberland River. The existing conditions of both creeks are eroding and lack any diversity in vegetation and hydrology. Dry Creek also lacks a riparian zone on its left bank and Grizzard Creek has minimal riparian zones on both banks. These conditions contribute to the “Non-Functioning” ECS scores for both streams. This project will restore the floodplain values in Dry and Grizzard Creeks and, through a conservation easement, protect the floodplain values consistent with the requirements of EO 11988, Floodplain Management (EO, 1977a).

5.2.2.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

If no action is taken, the creek banks would continue to erode and degrade resulting in an expanding floodplain that was not previously occupied by SFHA.

Alternative 2: Proposed Action

Implementing the Proposed Action will not result in significant adverse impacts to floodplains. The proposed relocation of the Dry Creek and Grizzard Creek segments is entirely within an SFHA (Appendix A, Figure 9). Because the relocation and restoration of the two stream segments results in improvement to the streams, the work serves as the required mitigation that is a condition of the TDEC and USACE permits. The proposed mitigation approach will reconnect the stream reaches to a more functional floodplain, restore natural channel geomorphology (dimension, pattern, profile), restore natural velocities, improve sediment transport, and reduce stream bank erosion. Connecting the proposed streams with their floodplain, increasing the entrenchment ratio, and reducing bank height ratio will lift the SQT hydraulic function to “Functioning.”

The construction of the floodwall around the Facility would contain any floods that are within a 100-year flood. This would not expand the floodplain’s current footprint and would allow both Dry Creek and Grizzard Creek to improve in functionality. Using the 8-step Process for EO 11988: Floodplain Management, the Project Site was evaluated, and it was determined that all designs and elevations match the 100-year floodplain mark.

5.2.3 Wetlands

EO 11990 Protection of Wetlands (EO, 1977b) requires federal agencies to avoid funding activities that directly or indirectly support occupancy, modification, or development of wetlands, whenever there are practicable alternatives.

5.2.3.1 Existing Conditions

Wetlands are defined by 33 CFR § 328.3(c)(1) as “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (USEPA, n.d.). Five wetlands were observed on the Facility’s property. All are located outside of the Project Site (Appendix A, Figure 8).

5.2.3.2 Potential Impacts and Proposed Mitigation

Because there are no state or federal jurisdictional wetlands within the Project Site, there will be no changes in the wetlands from implementing either the No Action or Proposed Action Alternative.

5.3 BIOLOGICAL RESOURCES

This section provides an overview of existing biological resources within the Project Site and the potential impacts to these resources that would be associated with the Proposed Action and No Action Alternatives.

Biological resources are regulated by federal and state laws. The laws relevant to biological resources in the vicinity of the Proposed Action include the following:

- The Endangered Species Act (ESA) (16 U.S.C. §§ 1531-1544)
- The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §§ 703-712) (for actions of nonfederal entities)
- Bald and Golden Eagle Protection Act (BGEPA) 16 U.S.C. §§ 668-668d,
- Rules of the Tennessee Wildlife Resources Agency (TWRA), Chapter 1660-01-32 (based on authority provided in Tennessee Code Annotated §§ 70-1-206, 70-8-104, 70-8-106 and 70-8-107)

5.3.1 Aquatic and Terrestrial Species and Vegetation

5.3.1.1 Existing Conditions

On March 20 and April 18, 2022, Barge Design Solutions, Inc., FEMA's consultant that prepared the EA, performed onsite investigations of the Study Area that included the delineation of wetlands and watercourses, as well as the identification of vegetation communities and habitat types that may be suitable for protected species with state and federal agencies. The Study Area defined in Appendix A, Figure 8 includes more land than the Project Site, which includes only the area where the creek segments will be relocated, and permits are required from TDEC and USACE.

Prior to visiting the Study Area, a resource review of available background site information was conducted using the U.S. Fish and Wildlife Service's (USFWS's) National Wetland Inventory (NWI) database to determine if wetlands could be found within the area. Topographic maps and the USGS National Hydrography Dataset (NHD) were evaluated for potential jurisdictional waters, and the USDA Natural Resources Conservation Service's (NRCS's) Web Soil Survey was reviewed for potential of hydric soils (Appendix A, Figure 5). Additionally, major landscapes and vegetation units were identified using aerial imagery prior to surveying the Study Area and again in the field before beginning field work. The Project Site is in an intensely developed area. The only undeveloped areas are the floodplains surrounding Dry and Grizzard Creeks and some remnant upland areas to the east and west of the Facility. No notable fish, other aquatic species, or wildlife were observed during the March 20 and April 18, 2022, site visits.

Most of the riparian zone vegetation around Dry Creek and Grizzard Creek is comprised of hackberry (*Celtis occidentalis*), American sycamore (*Platanus occidentalis*), and American elm (*Ulmus americana*). The forested areas adjacent to the streams are overgrown with early successional growth urban forest with a dense understory of invasive Chinese privet (*Ligustrum sinense*). In the upland areas Eastern red cedar (*Juniperus virginiana*), hackberry, sweetgum (*Liquidambar styraciflua*), and Chinese privet were observed.

Evidence of a past disturbance is evident within the 200-foot-wide buffer on the right side of Dry Creek. The site is dominated by young trees at a density greater than a healthy forested community can sustain. The trees were planted in the early 2000s, once the adjacent commercial facilities were constructed along Northgate Business Parkway.

5.3.1.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the existing fish, wildlife, and vegetation would not be impacted. As conditions change due to natural processes, the species composition may change.

Alternative 2: Proposed Alternative

No significant adverse impacts to the Aquatic and Terrestrial Species and Vegetation will result from implementing the Proposed Action. The proposed stream relocation will improve habitat quality for fish and aquatic mollusk species within the Cumberland River. Habitat for wildlife may improve some, but given the small areas of undeveloped habitat, the influx of new species will be limited. As part of the required mitigation for the stream relocation, MWS prepared planting plans for streambank, floodplain, and terrace for Dry and Grizzard Creeks (Tables 5-2 and 5-3).

Table 5-2 Dry Creek Planting Plan

Zone 1 - Streambank	Total Area = 0.25 acres	
Common Name	Scientific Name	Composition (%)
Ninebark	<i>Physocarpus</i>	20%
Silky Dogwood	<i>Cornus amomum</i>	30%
Buttonbush	<i>Cephalanthus occidentalis</i>	30%
Silky Willow	<i>Salix sericea</i>	20%
Total		100%
Zone 2 - Floodplain	Total Area = 0.81 acres	
River Birch	<i>Betula nigra</i>	20%
Eastern Redbud	<i>Cercis canadensis</i>	20%
Sweetgum	<i>Liquidambar styraciflua</i>	20%
Serviceberry	<i>Amelanchier arborea</i>	20%
Winterberry	<i>Ilex verticillata</i>	20%
Total		100%
Zone 3 - Terrace	Total Area = 1.43 acres	
Red Maple	<i>Acer rubrum</i>	20%
Common Alder	<i>Alnus glutinosa</i>	20%
Flowering Dogwood	<i>Cornus florida</i>	20%
Slippery Elm	<i>Ulmus rubra</i>	20%
Southern Red Oak	<i>Quercus facata</i>	20%
Total		100%

Table 5-3 Grizzard Creek Planting Plan

Zone 1 - Streambank	Total Area = 0.25 acres	
Common Name	Scientific Name	Composition (%)
Ninebark	<i>Physocarpus</i>	20%
Silky Dogwood	<i>Cornus amomum</i>	30%
Buttonbush	<i>Cephalanthus occidentalis</i>	30%
Silky Willow	<i>Salix sericea</i>	20%
Total		100%
Zone 2 - Floodplain	Total Area = 0.81 acres	
River Birch	<i>Betula nigra</i>	20%
Eastern Redbud	<i>Cercis canadensis</i>	20%
Sweetgum	<i>Liquidambar styraciflua</i>	20%
Serviceberry	<i>Amelanchier arborea</i>	20%
Winterberry	<i>Ilex verticillata</i>	20%
Total		100%
Zone 3 - Terrace	Total Area = 1.43 acres	
Red Maple	<i>Acer rubrum</i>	20%
Common Alder	<i>Alnus glutinosa</i>	20%
Flowering Dogwood	<i>Cornus florida</i>	20%
Slippery Elm	<i>Ulmus rubra</i>	20%
Southern Red Oak	<i>Quercus facata</i>	20%
Total		100%

5.3.2 Threatened and Endangered Species

The Endangered Species Act (ESA) (16 U.S.C. §§ 1531-1544 (1973)) provides for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead federal agencies for implementing ESA are the USFWS and the U.S. National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS). Under Section 7 of the ESA, federal agencies are required to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a “take” of any listed species of endangered fish or wildlife (see U.S.C. § 1532(19)).

5.3.2.1 Existing Conditions

Using the Study Area, the USFWS’s Information for Planning and Consultation (IPaC) online database was queried for trust resources on February 20, 2024 (Appendix B, Document 6). Included in trust resources are federally listed endangered and threatened species and species proposed for listing, candidate species. The IPaC report listed 13 species as potentially present

within, or near, the Study Area (Table 5-4). No species listed in the IPaC report were observed and no critical habitat for any of the species potentially occurring in the Study Area was identified.

Additionally, TDEC's Rare Species Data Viewer, TWRA's Rules and Regulations for In Need of Management, Threatened, and Endangered Species, and the Tennessee Natural Heritage Program's Rare Plant List were utilized to identify state listed species within the Study Area.

Table 5-4 State and Federal Endangered and Threatened Species

Common Name	Species	State Status	Federal Status	Habitat Type	State Rank*	Habitat Present	Observed
Mammal							
Gray bat	<i>Myotis grisescens</i>	Endangered	Endangered	Year-round resident in caves. Uses different caves for summer and winter roosting. Forages over open water, wetlands, and riparian areas during warm months.	S2	Yes (foraging habitat)	No
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	Endangered	Hibernates during winter in caves, or occasionally in abandoned mines. Summer roosting season in late spring and summer months. Females will roost on trees with exfoliating bark, and/or trees with cracks, crevices, and hollows. Will rarely roost in barns or other similar shed-like structures.	S1S2	Yes (summer roosting and foraging)	No
Tricolored bat	<i>Perimyotis subflavus</i>	Threatened	Threatened, Proposed Endangered	Hibernates during winter in caves, or occasionally in abandoned mines. Summer roosting season in late spring and summer months. Females will roost in leaf clusters in living or dead trees, as well as utilize cavities in living or dead trees and anthropogenic structures.	S2S3	Yes (summer roosting and foraging)	No
Bird							
Whooping Crane	<i>Grus americana</i>	Not Listed	Experimental Population, Non-Essential**	Breeds in freshwater marshes and prairies. Uses grain fields, shallow lakes and lagoons, and saltwater marshes on migration and in winter.	N/A	No	No
Mollusk							
Cumberlandian Combshell	<i>Epioblasma brevidens</i>	Endangered	Endangered	Medium-large rivers with riffles and shoals w/ relatively firm rubble, gravel, and stable substrates; within Tennessee & Cumberland River systems.	S1	No	No
Orangefoot Pimpleback	<i>Plethobasus cooperianus</i>	Endangered	Endangered	Large rivers in sand-gravel-cobble substrates in riffles and shoals in deep flowing water; within Cumberland & Tennessee River systems.	S1	No	No
Pink mucket	<i>Lampsilis abrupta</i>	Endangered	Endangered	Large rivers, prefers sand-gravel or rocky substrates with moderate to strong current; Tennessee and Cumberland River systems.	S2	No	No

Common Name	Species	State Status	Federal Status	Habitat Type	State Rank*	Habitat Present	Observed
Ring pink	<i>Obovaria retusa</i>	Endangered	Endangered	Large rivers in gravel and sand bars; Tennessee and Cumberland River watersheds; many historic locations currently inundated.	S1	No	No
Insect							
Monarch butterfly	<i>Danaus plexippus</i>	Not Listed	Candidate	Fallow fields or prairies with a presence of milkweed (<i>Asclepias spp.</i>) host plants for larval development.	N/A	Yes	No
Amphibian							
Streamside Salamander	<i>Ambystoma barbourin</i>	Endangered	Not Listed	Known from middle Tennessee in seasonally flowing karst streams	S3	Yes	No
Plant							
Price's potato-bean	<i>Apios priceana</i>	Endangered	Threatened	Thrives in open, wooded areas, often in forest gaps or along forest edges. Prefers mesic areas in open, low areas near streams or along the banks of streams and rivers. Grows in well-drained loams over limestone on rocky, sloping terrain.	S3	No	No
Braun's Rock-cress	<i>Arabis perstellata</i>	Not Listed	Endangered	Typically found on mesic, shady, steep, north-facing wooded slopes above streams or in ravines that lead into streams. The plants often occur either in sheltered areas, such as around the bases of larger trees, or in areas where there is little competition.	N/A	No	No
Guthrie's (Pyne's) Ground-plum	<i>Astragalus bibullatus</i>	Endangered	Endangered	Occurs in limestone cedar glade ecosystems in the Middle Tennessee Central Basin. The plants are associated with Lebanon limestone and occur in transitional areas or glade margins where the soils are deeper (5-15 cm) and there is partial shade from shrubs and small trees.	S1	No	No
Leafy prairie-clover	<i>Dalea foliosa</i>	Endangered	Endangered	Occurs in Tennessee and Alabama in open, thin-soiled limestone glades and limestone barrens. In Tennessee, the plants occur on wet calcareous barrens and moist prairies or cedar glades, usually near a stream or where some seepage from limestone provides seasonal moisture.	S2S3	No	No
Davis' Sedge	<i>Carex davisii</i>	Special concern	Not Listed	Occurs in bottomlands with riparian soils.	S1	Yes	No

*State Rank: The state rank is a numeric rating (S1 through S5) of relative rarity based primarily on the number of occurrences of the plant in the state.

S1– Extremely rare and critically imperiled in the state with five or fewer occurrences, or very few remaining individuals, or because of some special condition where the species is particularly vulnerable to extirpation from Tennessee.

S2– Very rare and imperiled within the state, six to twenty occurrences and less than 3,000 individuals, or few remaining individuals, or because of some factor(s) making it vulnerable to extirpation from Tennessee.

S3– Rare and uncommon in the state, from 21 to 100 occurrences.

Suitable habitat for the federally listed endangered gray bat, northern long-eared bat, and tricolored bat is present; however, the trees are in an area with a dense understory of Chinese privet that diminishes the suitability of the roosting and feeding habitat.

It is assumed that the listed aquatic mussel and clam species inhabit the Cumberland River as no remnants of aquatic mollusks were observed within the perennial waters of Dry Creek and Grizzard Creek, but Asian clam (*Corbicula fluminea*) was observed. None of the state or federally listed species listed in Table 5.4 were observed in the Study Area. Suitable habitat for the state listed streamside salamander is present. This species typically prefers intermittent streams with no predatory fish. While STR-1 was identified as an intermittent stream, this resource is outside of the Project Site and will not be impacted during the construction of the project and the relocation of Dry and Grizzard Creeks. Thus, the habitat will remain available for this salamander. BMPs will be followed to prevent adverse impacts to any state listed species potentially present within the site.

Some birds protected under the BGEPA and the MBTA may be present in the Study Area. The USFWS identifies these birds as Birds of Conservation Concern (BCC). The following species are BCC listed for the Study Area: bald eagle (*Haliaeetus leucocephalus*), bobolink (*Dolichonyx oryzivorus*), chimney swift (*Chaetura pelagica*), field sparrow (*Spizella pusilla*), prairie warbler (*Dendroica discolor*), prothonotary warbler (*Protonotaria citrea*), red-headed woodpecker (*Melanerpes erythrocephalus*), rusty blackbird (*Euphagus carolinus*), and wood thrush (*Hylocichla mustelina*). None were observed in the Study Area.

5.3.2.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would have no impact on threatened and endangered species. No existing or potential listed species habitat would be disturbed and there would be no “take” of federally threatened or endangered species.

Alternative 2: Proposed Action

Implementing the Proposed Action will not result in significant adverse impacts to the visual resources but would result in minor adverse impacts on listed species. FEMA initiated informal consultation with USFWS on November 20, 2023 (Appendix C, Correspondence 1). FEMA determined that the proposed action may affect, but not likely adversely affect the endangered gray bat and endangered northern long-eared bat. FEMA asked for concurrence from the USFWS, and on March 13, 2024, USFWS concurred with FEMA’s recommendations and added that tree removal is to occur from October 1 until March 31 to avoid or minimize potential impacts to the bats (Appendix C, Correspondence 2). This timeframe can also be used to avoid impacting any nesting migratory birds protected under the MBTA.

FEMA also initiated consultation with the TWRA concerning state-listed species on [TBP by Endia]. On June 24, 2024, TWRA responded and requested the presence/absence surveys be conducted for the state endangered streamside salamander prior to any instream construction

(Appendix C, Correspondence 3. Two surveys at least 45 days apart and conducted between December 15th through March 15th and by a person that possesses a TWRA Scientific Collection Permit were required. Because the request for the surveys was not received until June 24, 2024, the surveys cannot be initiated until at least December 15, 2024. TWRA's letter did state the agency "concluded they do not anticipate adverse impacts to state listed species under our authority due to the proposed construction; provided that best management practices to address erosion and sediment are implemented and maintained during construction activities." Should issues arise after the surveys are completed that would change the outcome of the EA, the EA will be modified to address the findings.

5.4 CULTURAL RESOURCES

As a federal agency, FEMA must consider the potential effects of its actions upon cultural resources prior to engaging in any project. Cultural resources are defined as, "evidence of past human activity. These include sites, districts, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture (NRCS, n.d.). There are several laws a federal agency must consider when working with and identifying cultural resources. For the Dry Creek Wastewater Treatment Plant Flood Mitigation Project, FEMA will meet this obligation through its Section 106 of the National Historic Preservation Act of 1966 (NHPA) consultation. Section 106 of the NHPA, as amended and implemented by 36 CFR Part 800, outlines the required process for federal agencies to consider a project's effects to historic properties. The NHPA defines a historic property as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register, including artifacts, records, and material remains relating to the district, site, building, structure, or object" (see 54 U.S.C. § 300308). Eligibility criteria for listing a property on the National Register of Historic Places (NRHP) are found at 36 C.F.R. Part 60. While the definition of a cultural resource under NEPA can be broader, FEMA regularly uses Section 106 to meet its obligations to consider effects to cultural resources. For this project, FEMA determined that it was appropriate to use its NHPA review to fulfill its NEPA obligations.

Cultural resources determined to be potentially significant under the NHPA are subject to a higher level of review and federal agencies must consider the potential effects of their projects on those resources and consider steps to avoid, minimize, or mitigate those effects. To be considered significant, a cultural resource must meet one or more of the criteria established by the National Park Service (NPS) that would make that resource eligible for inclusion in the NRHP. The term "eligible for inclusion in the NRHP" includes all properties that meet the NRHP listing criteria, which are specified in the Department of Interior regulations Title 36, Part 60.4 and NRHP Bulletin 15. Properties and sites that have not been evaluated at the time of the undertaking may be considered potentially eligible for inclusion in the NRHP and, as such, are afforded the same regulatory consideration as nominated properties. The Tennessee Division of Archaeology

(TDOA) maintains a database of Tennessee’s historic properties, the TDOA Site File HUB. FEMA uses this database, along with the NRHP National Resources Information Service (NRIS), as part of its efforts to identify significant cultural resources that may be impacted by a project.

For cultural resources surveys, the Area of Potential Effect (APE) is defined as, “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (CFR, 2024). Within the APE, impacts to cultural resources are evaluated prior to the undertaking for both Standing Structures (above ground resources) and Archaeology (below ground resources). The APE for this undertaking consists of the footprint of ground disturbance for the installation of a concrete floodwall, sheet piling, and two earthen berms around the perimeter of the Facility bounded by Edenwold Road to the north, the west bank of the Cumberland River to the east, and Edenwold Road Connection to the west. Ground disturbance will also occur outside of the Facility wall, on the south and east sides of the property up to the north fence line of Northgate Business Park at the rear of the buildings and around Gizzard Creek. This work will consist of filling in Dry and Gizzard Creeks then excavating new channels away from the Facility and installing six new utility pipes, five drainage ditches and trenches, and an access easement. Visual impacts for the concrete floodwall and earthen berms are anticipated to be minor as the viewshed has already been impacted by the original construction of the Dry Creek Wastewater Treatment Plant and other nearby industrial developments. There will be no visual impact from the proposed work on the south and east sides of the property.

To fulfill its Section 106 responsibilities, FEMA initiated consultation on this project in accordance with the Tennessee Statewide Historic Preservation Programmatic Agreement (2017 Statewide Agreement) executed on January 21, 2017, and subsequently amended, among the Tennessee State Historic Preservation Officer (SHPO), Tennessee Emergency Management Agency, and participating Tribal Nations. In addition to identifying historic properties that may exist in the proposed project’s APE, federal agencies must also determine, in consultation with the appropriate SHPO and interested Tribal Historic Preservation Officers (THPO), what effect, if any, the action will have on historic properties.

5.4.1 Historic and Archaeological Resources

FEMA evaluated potential resources in the APE utilizing the NPS NRHP GIS resource and the TDOA Site File HUB, along with previous and current cultural resource investigations. The project area is located on the west bank of the Cumberland River and east of Myatt Drive within the city of Nashville, Tennessee.

The review identified multiple archaeological sites and above ground resources within proximity to the APE. As part of FEMA’s consultation process, TRC utilized the Phase I archaeological

survey conducted in May 2022 by James N. Greene and Krista Jordan-Greene of TRC Environmental, Inc. (*Phase I Cultural Resources Survey for the Dry Creek Flood Mitigation Project, Davidson County, Tennessee*). In addition, USACE requested TRC Environmental, Inc. to conduct an architectural survey in August 2023. Within background research the archaeological survey reidentified one archaeological site of unknown eligibility which is mostly located under pavement adjacent to the APE. No resources or deposits were identified from this site during the above survey. The architectural survey did not identify any historic properties that are eligible for the NRHP within the APE.

However, FEMA identified the Louisville & Nashville Railroad which is eligible for listing in the NRHP within the viewshed of the proposed undertaking. The viewshed from the railroad has already been impacted by the original construction of the Dry Creek Wastewater Treatment Plant and other nearby industrial development.

5.4.1.1 Potential Impacts and Proposed Mitigation to Historic and Archaeological Resources

Alternative 1: No Action

If no action is taken, there would be no ground disturbance or new construction resulting in viewshed impacts. Therefore, under the No Action Alternative there would be no impact to cultural resources.

Alternative 2: Proposed Action

Under the proposed action, there would be no adverse effects to the previously identified archaeological site adjacent to the APE as the archaeological survey within the APE was negative for any historic properties or cultural resources. The undertaking has also been conditioned to include archaeological monitoring and protective surface treatment in areas of interest. There will be no adverse effect visually to the NRHP-eligible Louisville & Nashville Railroad resulting from the construction of the floodwall and earthen berm as part of this project. In accordance with Section 106 of the NHPA, and the implementing regulations, 36 CFR Part 800, on November 6, 2023, FEMA consulted with SHPO and federally recognized tribes with an ancestral interest in the project area: Absentee Shawnee Tribe of Oklahoma, Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town of the Creek Nation, Cherokee Nation, Chickasaw Nation, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Muscogee (Creek) Nation, Poarch Band of Creek Indians, Seminole Tribe of Florida, Shawnee Tribe, and United Keetoowah Band of Cherokee Indians in Oklahoma with a finding of No Adverse Effect to Historic Properties for this undertaking in accordance with 36 CFR 800.4(d)(1) (Appendix C, Correspondence 4). In addition, FEMA sent a follow up consultation to all aforementioned parties on January 8, 2024, to notify them of the request for archaeological monitoring and offer additional

time to comment. Responses were received from the Eastern Band of Cherokee Indians on November 14, 2023, Eastern Shawnee Tribe of Oklahoma on December 28, 2023, and SHPO on November 15, 2023. All responding consulting parties concurred with FEMA's determination of No Adverse Effect to Historic Properties. However, due to the proximity of a known archaeological resource, the project was conditioned with archaeological monitoring during construction. Details of the required monitoring process are provided in Appendix C, Correspondence 4.

5.5 SOCIOECONOMIC RESOURCES

5.5.1 Land Use and Planning, Transportation, Utilities, and Public Health & Safety

5.5.1.1 Existing Conditions

Land use is defined as the way people use and develop land, including uses such as agricultural, residential, recreational, government, and industrial. The Project Site is within the Metro Government of Nashville and Davidson County (Metro Nashville).

The Dry Creek Water Reclamation Facility is within a tract of land zoned as Industrial Restrictive District (IR) in Metro Nashville's Parcel Viewer website (Nashville Planning Department, n.d.). The IR district is for light industrial uses. Land to the east and across the Cumberland River is zoned R15, medium intensity one-family and two-family development. That land is mostly undeveloped. North of the Facility is the Harbor Village community (R15 Zoning), a small parcel of land zoned Industrial Warehousing/Distribution District (IWD), and more land zoned IR. To the west the land is zoned CD, Commercial Service District.

The transportation infrastructure and access to the Project Site is limited. The only access to the Facility is by turning from Myatt Drive onto Edenwold Road. Myatt Drive separates the Facility from other businesses to the west. The CSX railroad tracks on the north side of the Facility are parallel to Edenwold Road. There is no road that crosses to the north side of the tracks from Edenwold Road. The Cumberland River is to the east. There are no docks that would provide access to the Project Site. To the south is Northgate Business Park, but there is no road connection from the Facility to the business park.

There is one 2-way Tennessee Department of Transportation (TDOT) station (Location ID 19000337) on Myatt Drive immediately north of the intersection with Edenwold Road. The annual average daily traffic (AADT) count in 2022 was 25,853 vehicles. In 2021 the count was 26,942, and in 2020, the count was 24,686. The values provided are AADT volumes based on a 24-hour, two-directional count at the location. The raw traffic data is mathematically adjusted for vehicle type, determined by an axle correction factor. The data are then statistically corrected by a seasonal

variation factor that considers the time of year and day of the week. These data were obtained from TDOT (Tennessee Department of Transportation, 2023).

All utilities needed for construction of the project are present and available at the Project Site. Construction of the floodwall and the work needed to relocate and restore segments of Dry and Grizzard Creeks will require access to electricity, water, cell phone service, and waste disposal.

If there is a need for public health and safety services, the Officer Phil Scurry Madison Police Precinct and Nashville Fire Department Station 31 are 1.1 and 3.3 miles respectively from the Project Site. Additionally, the Ascension Saint Thomas Urgent Care – Madison is 1.2 miles from the Project Site and the TriStar Hendersonville Medical Center is 7.1 miles away.

5.5.1.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

If no action is taken, existing land use will not change and there will be no changes to current conditions unless initiated by another landowner in the area. Taking no action will result in no impacts to transportation, public services and utilities, public health and safety needs, or need for these services unless initiated by another landowner.

Alternative 2: Proposed Action

Implementing the Proposed Action will not result in significant adverse impacts to Land Use and Planning, Transportation, Utilities, and Public Health & Safety. Constructing the floodwall and relocating and restoring the stream segments will not result in a need to change existing land use or zoning, impact any existing utilities, require any new public services or utilities, or create any impacts to public health and safety.

Constructing the floodwall and relocating segments of Dry and Grizzard Creeks will not have any long-term impacts on the transportation infrastructure. During construction, there may be a slight increase in the AADT due to the workers needed to construct the floodwall and relocate the stream segments and for delivery of material needed for the construction, but this will be temporary and end when construction is completed. Once the work is done, a few workers or employees will periodically be needed to maintain the floodwall and monitor the restoration of the stream segments.

5.5.2 Noise

5.5.2.1 Existing Conditions

Noise is described as unwanted sound, based on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). Sound, including noise,

is typically measured in decibels (dB). When discussing noise experienced by humans, sound is weighted because the human ear does not hear all frequencies of sound equally. The weighted decibel, dBA, expresses loudness perceived by the human ear. A day-night average sound level of 55 dBA is commonly used as a threshold level for noise which could result in adverse impacts, and prolonged exposure to levels above 65 dBA is considered unsuitable for residential areas (USEPA, 1974). The threshold of human hearing is approximately 0 dBA, and the threshold of discomfort or pain is around 120 dBA.

The magnitude and frequency of environmental noise may vary over the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetation cover. Noise levels occurring at night generally produce a greater annoyance than do the same levels occurring during the day.

The Noise Control Act of 1972 and its subsequent amendments (42 U.S.C. §§ 4901–4918) delegate authority to the states to regulate environmental noise. It also directs government agencies to comply with local community noise statutes and regulations. Metro Nashville’s Code of Ordinances limits certain noise levels and times of day noises over a certain decibel are allowed (Metro Government of Nashville and Davidson County, 2023).

Noise levels at the Facility and other adjacent commercial and light industrial areas are higher than in residential areas due to the operation of machinery, pumps, and other mechanical devices. Typical noise levels of equipment that would be used for implementing the Proposed Action taken from the American National Standards Institute’s website are provided in Appendix A, Figure 9.

5.5.2.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, there would be no changes to noise levels at the Facility unless new equipment at the treatment plant or adjacent businesses are added that contributes to increased noise levels.

Alternative 2: Proposed Action

No significant adverse impacts to the noise levels will result from implementing the Proposed Action. Noise levels would temporarily increase due to the additional equipment and machinery needed to construct the floodwall. Noise levels would return to the normal background level for the Facility as once the floodwall is constructed, it will not generate any new noise. Chapter 9.30.010 of the Metro Government of Nashville and Davidson County Code of Ordinances details the restrictions on when construction can occur. MWS would comply with this ordinance. Additionally, the Tennessee Occupational Safety and Health Administration (TN OSHA) requires

hearing protection for noise levels above 90 dBA. MWS would ensure the contractor complies with Metro Nashville's noise ordinance and all TN OSHA regulations.

5.5.3 Socioeconomics

5.5.3.1 Existing Conditions

The primary factors in assessing the socioeconomic conditions of the community in the area surrounding the Project Site are race, income, education, and employment. The data presented below are taken from the U.S. Census Bureau data (USCB, n.d.) for the Nashville-Davidson County Metropolitan Area (Metropolitan Area) and the Census Tract (CT) and Block Group (BG) of the Project site.

In 2020 the population of the Metropolitan Area was 715,884. The Project Site is within CT 104.01 and BG 3. The population of the BG 3 was 2,086 in 2020 with approximately 54 percent of the population White; 31.6 percent of the population Black or African American; 0.01 percent American Indian and Alaskan Native; 0.02 percent Asian; 0.002 percent Native Hawaiian and Other Pacific Islander; and 14.4 percent two or more races. Approximately 11.0 percent of the population was two or more races. Additionally, 87.1 percent of the population is over 18 years old, and 16.3 percent of the population is over 65 years old. Approximately 43.6 percent of the population were men and 56.4 percent of the population were women.

The USCB estimated per capita income for BG 3 in 2023 was \$38,109 which is lower than the state estimate of \$38,538 and the Metropolitan Area estimate of \$51,804. The USCB estimated median household income for BG 3 in 2023 was \$54,813 which is also lower than the state estimate of \$67,631 and lower than the Metropolitan Area estimate of \$80,379.

In 2023, the USCB estimates that 62.2 percent of people over 18 to 24 years of age were high school graduates and approximately 24.4 percent of all ages were college graduates. Employment data is only available for the CT. For all persons over the age of 16, the employment rate was 67.3 percent in 2023 with 2.8 percent unemployed, 1.4 percent in the armed forces, and 32.7 percent not in the labor force.

5.5.3.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the proposed floodwall would not be constructed and there would be no impact on the community demographics.

Alternative 2: Proposed Action

The Project Site is within the boundary of Dry Creek Wastewater Treatment Plant property with a small portion in the floodplain portion of two privately owned properties . The location of the new floodwall is approximately 0.2 miles from the nearest residence. Construction impacts will be

temporary and will not have any adverse impacts to those living in the BG or beyond. Once completed, the project will not alter the demographic characteristics of BG 3. No displacement or relocation will result from this project for individuals or families. The project will not increase or decrease employment or income patterns.

5.5.4 Hazardous Materials

5.5.4.1 Existing Conditions

The portions of Dry and Grizzard Creeks within the Project Site are forested and undeveloped. During the site visits to these Project Site, no hazardous wastes were observed. A check of USEPA's Search for Superfund Site Where You Live website (Environmental Protection Agency, n.d.) found no superfund sites in Davidson County.

There are hazardous materials used at the Dry Creek Facility and some adjacent businesses but implementing the Proposed Action will not involve any of these materials as they have no connection to the construction of the floodwall or stream relocation. The Dry Creek facility and any nearby business that uses hazardous material should have BMPs for minimizing spills and plans in place to address a spill should it occur.

5.5.4.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, no hazardous materials would be brought to the Project Site by MWS or their contractors and there would be no impacts to the Project Site from hazardous materials.

Alternative 2: Proposed Action

No significant adverse impacts to the hazardous materials will result from implementing the Proposed Action. During construction and maintenance, small amounts of hazardous waste would be generated. Hazardous waste that may be generated during construction includes hydraulic fluids, used oil, paint and paint thinner, other petroleum-based fluids, and any materials saturated with these fluids. No hazardous waste would be generated during operation.

By following guidance in the Stormwater Pollution Prevention Plan (SWPPP) required for this project and implementing BMPs, minimal direct and indirect impacts from hazardous waste storage and spills are anticipated. BMPs would be implemented to minimize the potential of a spill and to instruct onsite workers on how to contain and clean up spills. Details regarding the handling of spills would be included in the SWPPP. Any spill that may occur, regardless of amount, would

be cleaned up within 48 hours and a spill report completed. Copies of spill and cleanup reports would be kept onsite during construction.

All hazardous materials would be stored onsite in storage tanks, vessels, or other appropriate containers specifically designed for the characteristics of these materials. Collection and disposal of these wastes would be conducted in accordance with applicable regulatory requirements to minimize health and safety effects. All hazardous waste would be transferred to an approved landfill or processing center. To the extent possible, hazardous waste would be recycled. The removal of any invasive species will be disposed of properly in accordance with state disposal laws and regulations.

Fuel for construction equipment may be stored onsite during construction. Fueling of construction vehicles would occur within the laydown area. Appropriate safety protocols would be followed during fueling.

6.0 CUMULATIVE IMPACTS

The 2022 version of CEQ's NEPA regulations, Title 40, Chapter V, Subchapter A, defines cumulative effects as "effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (CEQ, 2022).

Land surrounding the Project Site is mostly zoned commercial and light industrial. Existing undeveloped land is designated as flood zone AE by FEMA and has a high chance of flooding. Development of that land is unlikely in the foreseeable future. Additional development would primarily be redevelopment of existing sites. Impacts arising from constructing the floodwall and stream relocations will have a minor benefit for aquatic organisms and species utilizing the riparian zone surrounding the creeks.

Desktop research of potential past, present, and future actions in an area within a 0.5-mile radius of the Project Site did not identify any past, present, or foreseeable future local projects that could combine with the Proposed Action to cause cumulative impacts that may significantly affect the environment.

7.0 PERMITS AND PROJECT CONDITIONS

7.1 PERMITS

Permit/Approval	Associated Documentation	Lead Agency	Permit Conditions
Endangered Species Act Section 7 (ESA)	Informal consultation presenting results of biological survey and protected species habitat assessment and impact determinations	U.S. Fish and Wildlife Service (USFWS)	No endangered species were observed within the Project Site. If necessary, any endangered or threatened species will be reported to the USFWS immediately.
Migratory Bird Treaty Act (MBTA)			
Section 404 of the Clean Water Act – Nationwide Permit 27	Approved Jurisdictional Determination (AJD) Package and concurrence letter	U.S. Army Corps of Engineers (USACE)	BMPs will be installed to ensure the sediment or other pollutants remain within the Project Site.
Section 106 National Historical Preservation Act consultation	Cultural Resources Survey Report/Results	Tennessee Historical Commission (SHPO)	No historical or cultural artifacts were observed within the Project Site. If necessary, if any archeological or artifacts are found, the TN SHPO office will be contacted immediately.
Aquatic Resource Alteration Permit (ARAP)/Section 401 Water Quality Certification	Hydrologic Determination (HD) Package and concurrence letter	TDEC – Division of Water Resources	Improvements will be made to Dry Creek and Grizzard Creek to raise the functionality score.
Construction General Permit (NPDES) Permit No. TNR 100000	Stormwater Pollution Prevention Plan (SWPPP)	TDEC – Division of Water Resources	A SWPPP has been planned and will be implemented to ensure all water quality is reached.
Approval	Response	Tennessee Wildlife Resources Agency – Biodiversity Division	Presence/absence surveys for the streamside salamander to be performed prior to any instream construction. Surveys must be conducted by a person that possesses a TWRA Scientific Collection Permit during the survey period of December 15th through March 15th. Two surveys, no fewer than 45 days apart, are required within the survey period.

7.2 PROJECT CONDITIONS

7.2.1 General Project Conditions

1. The subrecipient will obtain and comply with all required local, state, and federal permits and approvals.
2. If deviations from the proposed scope of work result in substantial design changes, the need for additional disturbance to the Dry or Grizzard Creeks, or any other unanticipated changes to the physical environment, the subrecipient will contact FEMA so that the revised project scope can be evaluated for compliance with NEPA and other applicable environmental and historic preservation laws.
3. Secure the construction area from public access and use signage at all entrances and exits indicating only authorized personnel may enter the Project Site.

7.2.1 Physical Resources

4. Commit to the best available emissions control technologies for project equipment to meet USEPA exhaust emissions standards for model year 2010 and newer heavy-duty, on-highway compression-ignition engines (e.g., long-haul trucks, refuse haulers,) and meet the USEPA Tier 4 exhaust emissions standards for heavy-duty, non-road compression-ignition engines (e.g., construction equipment).
5. Minimize construction equipment engine idling to the extent practicable and properly maintain engines to reduce the emissions of criteria air pollutants.
6. Cover and/or apply water or chemical/organic dust palliative to stabilize open storage piles and disturbed areas where appropriate.

7.2.1 Water Resources

7. The subrecipient will obtain a permit for impacts on Waters of the United States in accordance with Sections 401 and 404 of the CWA and adhere to all conditions as required in those permits.
8. The subrecipient will prepare a SWPPP to obtain an NPDES permit and an Individual Aquatic Resource Permit from TDEC and adhere to all conditions required in those permits.
9. Construction activities, equipment staging, and storage activities are not to be located within or adjacent to any nearby wetlands.

7.2.1 Biological Resources

10. Advise all personnel that there are civil and criminal penalties for harming, harassing, or killing listed species.

11. Operations of moving equipment shall cease if a protected species is observed within 50 feet of operations. Activities shall not resume until the protected species has departed the project area of its own volition.

12. Report any interaction with a protected species immediately to the USFWS office: 446 Neal Street, Cookeville, TN 38501, (931) 528-6481.

13. Use the following conservation measures during the construction activities to reduce impacts to birds and their habitats protected under MBTA.

a. To the extent practicable, schedule all vegetation removal, trimming, and grading of vegetated areas from September 1st – March 31st, which is outside of the peak breeding season for migratory birds.

b. Educate contractors about relevant rules and regulations that protect wildlife. Prior to the onset of construction activities, the contractor's designated lead will conduct a briefing with all construction staff to instruct them on the potential presence of species protected under MBTA. If work occurs during a bird's breeding season, briefing boards strategically placed at laydowns area will inform construction staff of the species' scientific and common name, a picture of the bird, timing of breeding, and habitat notes.

c. Do not collect birds (live or dead) or their parts (e.g., feathers) or nests without a valid permit.

d. Report any incidental take of a migratory bird, to:

U.S. Fish and Wildlife Service Migratory Bird Permit Office 1875 Century Blvd.
Atlanta, GA 30345 404-679-4163

14. Wash construction equipment prior to contact with waters and unpaved areas to minimize the spread of invasive species.

15. Properly dispose of vegetation removed from the Project Site to avoid incidentally dispersing invasive plants.

16. Use the plants listed in this EA to revegetate areas disturbed by construction.

7.2.1 Cultural Resources

17. Monitor all ground disturbing activities associated with the project located within proximity to Dry Creek, Gizzard Creek, and the Cumberland by a Secretary of the Interior (SOI) qualified archaeologist.

7.2.1 Socioeconomic Resources

18. Implement standard soil erosion and dust control measures.
19. Limit construction activities to between dawn and dusk.
20. Provide solid waste receptacles for non-hazardous waste at all project areas.
21. To minimize noise impacts, construction activities will adhere to all local noise ordinances.
22. Avoid, to the greatest extent practicable, transporting materials to and from the construction area through school zones and areas with low-income and minority populations.
23. Use qualified and trained personnel to minimize risks to safety and human health.
24. Conduct all construction activities in accordance with the standards specified in the OSHA regulations.
25. During ground disturbing activity, properly treat, store, and dispose of any contaminated soil according to applicable federal, state, and local regulations.
26. Handle and dispose of all hazardous materials discovered, generated, or used during construction in accordance with applicable federal, state, and local regulations.
27. Keep construction equipment in good working order. Inspect equipment daily for fuel and fluid leaks, promptly repair any leaks, and clean up any spills.
28. In the event of an inadvertent spill, the subrecipient must immediately call the Tennessee Emergency Management Agency (TEMA - 1-800-262-3300).

8.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

While preparing the EA, coordination was required with one federal agency, several tribes, and one state agency.

Federal Agency

U.S. Fish and Wildlife Service – consultation initiated November 20, 2023. Response received March 13, 2024.

U.S. Army Corps of Engineers, Nashville – consultation was initiated August 19, 2023. Permits are still pending.

State Agency

Tennessee Historical Commission – consultation initiated January 21, 2017, and was reinitiated on November 6, 2023. Response received November 15, 2023

Tennessee Department of Environment and Conservation - consultation initiated June 29, 2022. Permits were received.

Tennessee Wildlife Resources Agency – Consultation initiated June 3, 2024. TWRA response received June 24, 2024.

Tribes

Absentee Shawnee Tribe of Oklahoma – No response
Alabama-Coushatta Tribe of Texas – No response
Alabama-Quassarte Tribal Town of the Creek Nation – No response
Cherokee Nation – No response
Chickasaw Nation – No response
Eastern Band of Cherokee Indians – Responded November 14, 2023
Eastern Shawnee Tribe of Oklahoma – Responded December 28, 2023
Muscogee (Creek) Nation – No response
Poarch Band of Creek Indians – No response
Seminole Tribe of Florida, Shawnee Tribe – No response
United Keetoowah Band of Cherokee Indians in Oklahoma – No response

The EA will be posted on the [National Environmental Policy Act Repository | FEMA.gov](#) and MWS (<https://www.nashville.gov/departments/water>) websites. The public will be able to review the EA online and provide comments via either website.

9.0 LIST OF PREPARERS

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11.0 COMMENTS/RESPONSE

Any public comments and responses of the public notice and EA draft will be made available in this appendix upon request if a FONSI is issued.

**Appendices are available for review upon request to
FEMA-R4EHP@fema.dhs.gov**