U.S. Department of Homeland Security
FEMA Region 5
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Chicago, Illinois 60605-1521

FEMA

August 17, 2022

Environmental Assessment Scoping Document

SECTION ONE: BACKGROUND

1.1 Project Information:

Project ID:	FEMA-DR-4507-OH Advanced Assistance Project
Recipient:	Ohio Emergency Management Agency
Subrecipient:	Mahoning Valley Sanitary District (MVSD)
Title:	Mineral Ridge Dam Rehabilitation Environmental Assessment
Address:	Impounds Meander Creek Reservoir
Locality:	Weathersfield Township, Trumbull County, Ohio
GPS:	41.153333, -80.779167
PLSS:	T3N R3W

1.2 Purpose and Need:

The objective of the HMGP is to provide the opportunity to take critical mitigation measures following a disaster to reduce the risk of loss of life and property from future disasters. The purpose of the proposed action is to continue providing a safe and reliable water supply source to MVSD's community customers and to maintain the public health and safety of the downstream population. MVSD utilizes the Meander Creek Reservoir, Mineral Ridge Dam, and their downstream water treatment plant to furnish water to two member cities of Youngstown and Niles, and to the Village of McDonald as agent of these member cities. These entities then supply water to the surrounding metropolitan area including Girard, Canfield, Mineral Ridge, the Village of Lordstown, Craig Beach, and portions of ten townships in Trumbull and Mahoning Counties. The population served is approximately 220,000.

Mineral Ridge Dam is classified as a Class I structure by the Ohio Department of Natural Resources (ODNR). This high-hazard classification indicates that a failure of the dam would result in the probable loss of human life. Construction of the 90-year-old dam was completed in 1932, and major modifications and repairs were made to the dam in 1995.

In 2014, MVSD requested that Gannett Fleming, Inc. perform a comprehensive assessment of the dam to determine if it meets current dam safety design requirements, and to develop needed repairs. Gannett Fleming inspected Mineral Ridge Dam and its appurtenances, reviewed associated documentation, and prepared detailed studies and analyses to evaluate the dam for potential failure modes. Gannett Fleming's assessment of the dam identified deficiencies related to deterioration of the structure over time, deficiencies related to more conservative dam design criteria, increased hydraulic and

seismic loads relative to when the dam was designed, and deficiencies related to potential failure modes not previously identified.

Rehabilitation of the Mineral Ridge Dam is needed to address potential failure modes identified at the dam, bring the facility into compliance with current ODNR and federal dam safety criteria, and address necessary upgrades and repairs. The project anticipates a useful life of at least 50 years with scheduled maintenance.

SECTION TWO: ALTERNATIVE ANALYSIS

NEPA requires FEMA to evaluate alternatives to the proposed project and describe the environmental impacts of each alternative. NEPA also requires an evaluation of the No Action alternative, which is the future condition without the project. This section describes the No Action alternative, the Proposed Action, and reviews the alternatives that were previously considered but dismissed.

A potential failures modes (PFMs) analysis for Mineral Ridge Dam was performed by Gannett Fleming which identified PFMs for the structure under existing conditions, assessed factors that contribute to the credibility of each PFM, and identified remediation features to address the PFMs. As a result of the PFM analysis and subsequent investigations, it was determined that multiple features at the dam do not meet current dam safety criteria to continue providing a safe and reliable water supply source and maintain the safety of the downstream population. Additionally, the existing structure does not meet the requirements of the state dam safety regulator, ODNR Division of Water Resources.

Five major PFMs were identified at the high hazard potential Mineral Ridge Dam by Gannett Fleming in 2016:

1. Principal Spillway - Failure by sliding at the bottom of the concrete cutoff during extreme events due to low rock strength, ineffective foundation drains, and relatively flat bedrock bedding;

2. Existing Twin Auxiliary/Emergency Spillways - Failure by surface erosion and breaching due to high velocities in the vegetated and riprapped portions of the discharge channel;

3. Dam Embankment - Failure by uncontrolled seepage and internal erosion due to the absence of an internal drainage system, high pore pressures measured in downstream embankment, and dispersive soils identified during testing;

4. Top of Dam – Failure by seepage, surface erosion and downstream slope instability due to a seepage window between the concrete curb at top of dam and concrete core wall, and the absence of an internal drainage system in the embankment; and

5. Inadequate Spillway Capacity (Marginal) – Failure by overtopping and surface erosion of the earth embankment due to inadequate spillway capacity during the Probable Maximum Flood and a low area present at the east abutment.

The above PFMs along with other dam safety deficiencies and remediation solutions developed by Gannett Fleming were reviewed by an Independent Technical Review Panel (TRP) convened by the MVSD in 2017. The TRP concluded that major and permanent

remedial efforts would be required to bring dam components into compliance with contemporary standards.

Alternatives analyses were performed during conceptual-level investigations to develop and screen rehabilitation alternatives for Mineral Ridge Dam. A total of nine conceptual dam modification alternatives were developed to address the known PFMs and bring the dam into compliance with current dam safety standards. Based on discussions with MVSD, two of the nine alternatives were not considered to be feasible from a water supply standpoint due to the significant lowering of pool level that would be required during construction and/or during flood events. The remaining seven alternatives shared common rehabilitation features, including: maintaining the normal pool level; increasing the top of dam; stabilizing the principal spillway; flattening the downstream embankment; rehabilitating two access roads, redirecting surface runoff, and repairs to the gate house. A comparison of the seven feasible alternatives and their varying key features was performed to determine a preferred alternative in consideration of project cost, schedule, and meeting project purpose and need. The preferred alternative is described herein as the Proposed Action.

2.1 Alternative 1 –No Action Alternative

The No Action Alternative is used as a baseline for comparison to estimate the benefits and impacts presented in the Proposed Action Alternative. Under the No Action Alternative, the existing Mineral Ridge Dam would not be modified and would remain in its current state. Considering the dam safety deficiencies identified at the dam, this alternative would result in an unacceptable risk to public health and safety of the downstream population and reliability of the water supply storage for communities in Youngstown, Niles, and McDonald.

2.2 Alternative 2—Proposed Action

The proposed action consists of the implementation of a dam rehabilitation project to address dam safety deficiencies identified at Mineral Ridge Dam, bring the facility into compliance with current ODNR and federal dam safety criteria, and address needed upgrades and repairs. The major components of the dam rehabilitation project are listed below.

Abandon the existing twin auxiliary spillways and replace with a new roller-compacted concrete (RCC) auxiliary spillway, grass-lined channel, and riprap lined channel.

Extend the existing embankment concrete core wall up to Elevation 918.0 feet, which is approximately 0.3 feet above the computed Probable Maximum Flood spillway design flood peak reservoir level, and modify the top of dam roadway.

Flatten the downstream embankment slope from 2.0 Horizontal to 1.0 Vertical (2H:1V) to between 2.5H:1V and 3H:1V to improve stability, and install internal filter drains to safely collect and convey potential seepage.

Modify and repair the principal (or primary) spillway, including raising and buttressing the existing training walls with new reinforced concrete walls to accommodate the flattened embankment slopes, lining the ogee surface and stilling basin with a new reinforced concrete liner slab, installing rock anchors in the stilling basin slab to improve stability and concrete surface repairs.

Install post-tensioned anchors into the dam's foundation to improve the stability of the principal spillway concrete ogee structure and the gate house structure.

Replace the existing inflatable rubber dam and controls at the principal spillway.

Replace the stairway on the east embankment slope.

Remove the existing spoil pile to improve surface drainage adjacent to the downstream toe of the east embankment slope.

Upgrade dam-related instrumentation, electrical and lighting systems on the gatehouse and road.

Improve the existing east and west access roads leading to the dam.

Re-grade the low area at the east abutment of the dam to eliminate the area of overtopping during the Probable Maximum Flood.

Install temporary erosion and sediment controls, diversion of water and excavation dewatering features to facilitate rehabilitation construction.

The fixed crest elevation of the ogee spillway, the fully inflated crest elevation and the auto deflation elevation of the replacement inflatable rubber dam, the crest elevation of the ungated auxiliary spillway, the peak 100-year reservoir level and 100-year outflow, and the peak Probable Maximum Flood reservoir level would be unchanged from existing conditions under the proposed alternative.

Value engineering and independent peer review was performed during the design process to minimize construction costs, verify constructability, and minimize impacts to environmental and cultural resources.

2.3 Alternatives Considered and Eliminated from Further Analysis

As described in Section 2.1, the alternatives analyzed shared several common features. This resulted in similar overall environmental impacts at Mineral Ridge Dam, since these impacts are in project areas that require rehabilitation and modification to improve the safety and reliability of the dam. Due to their similarities, alternatives were further considered and eliminated based on key variations to the principal spillway and new auxiliary spillway. The overall least cost alternative for the project included replacing the existing bladder on the existing principal spillway crest and not changing the fixed crest elevation or the normal pool elevation.

Principal Spillway Alternatives Not Selected

Principal spillway alternatives that were considered but not selected included lowering the fixed crest elevation and eliminating the inflatable rubber bladder and raising the fixed crest elevation.

In addition to increasing overall dam modification alternative cost, removal of the inflatable rubber bladder and permanently raising the crest was not selected because it would result in raising of the normal pool and need for a larger auxiliary spillway structure.

Lowering of the fixed principal spillway crest and installation of large gates at the principal spillway was considered in an effort to eliminate the need for an auxiliary spillway. This principal alternative was eliminated due to the potential for loss of significant water supply storage during gate activation and did not offer a reduction in overall dam modification alternative cost.

New Auxiliary Spillway Alternatives

Each of the auxiliary spillway alternatives that were considered included a downstream RCC drop structure. Seven of the auxiliary spillway alternatives included removal of the existing twin auxiliary spillways and two included modifying the existing auxiliary spillways to augment the discharge capacity of the new auxiliary spillway. Modifying the existing twin auxiliary spillways was eliminated due to seepage, uplift, and erosion concerns that were identified during the PFM analysis of the existing structure, and which could not be addressed or corrected in a cost-effective manner.

Three alternatives that included a new labyrinth-type conventional concrete spillway with articulated concrete block (ACB) armored downstream channels were considered but not selected due to higher overall construction costs relative to the selected alternative. The higher construction costs were primarily associated with foundation constraints and relatively large amount of conventional concrete required for construction of the labyrinth.

One alternative that included replacing the existing twin auxiliary spillways with new twin conventional concrete broad-crested weir spillways with an ACB-armored downstream channel was considered but not selected due to higher overall construction costs relative to the selected alternative.

Three alternatives included a new, stepped RCC control structure. The RCC control structure was determined as the most feasible alternative due to overall construction cost and elimination of foundation concerns. The RCC control structure was optimized during design to consist of a conventional concrete ogee-crested weir with an RCC chute, training walls, and stilling basin, and downstream riprap apron. The stilling basin invert elevation was lowered to eliminate the downstream steep channel slope and to allow for energy dissipation to occur in the stilling basin prior to entering the grass-lined/riprap-lined channel. Lowering of the stilling basin resulted in elimination of a downstream RCC drop structure.

Dam Decommissioning

Decommissioning (removal) of the dam was not considered to be a technically feasible alternative. Removal of the dam would result in permanent draining of the reservoir, which would eliminate the hazard to downstream population. However, this alternative would also result in the permanent loss of critical water supply storage benefitting downstream communities and the loss of potential flood protection benefits.

SECTION THREE: AFFECTED ENVIRONMENT

The proposed project impounds Meander Creek Reservoir along Meander Creek within Weathersfield Township, Trumbull County, Ohio. The portion of Mineral Ridge Dam where the proposed project would occur is in an environment of both natural areas and maintained infrastructure including the creek and reservoir.

Alternative 2 the proposed action proposes to rehabilitate Mineral Ridge Dam located on Meander Creek in Weathersfield Township, Trumbull County, Ohio. Major project features include permanently flattening the embankment slopes, repairs to the principal spillway, and replacement of the auxiliary spillway along with a temporary stream crossing of Meander Creek. This dam rehabilitation project will have temporary stream impacts of 0.923 acres. It will also include littoral impacts to Meander Creek Reservoir; permanent impacts total 0.446 acres and temporary impacts total 0.673 acres. Additional impacts to wetlands are expected with approximately 0.398 acres of permanent impact and 0.018 acres of temporary impacts. Dewatering will occur approximately 150 feet downstream of the principal spillway. This area will be used as a temporary crossing during construction activities and returned to existing grade upon completion of all activities. Impacted streams and wetlands will be protected with proper erosion and sediment control measures.

Exhibit 1: General Project Location Aerial

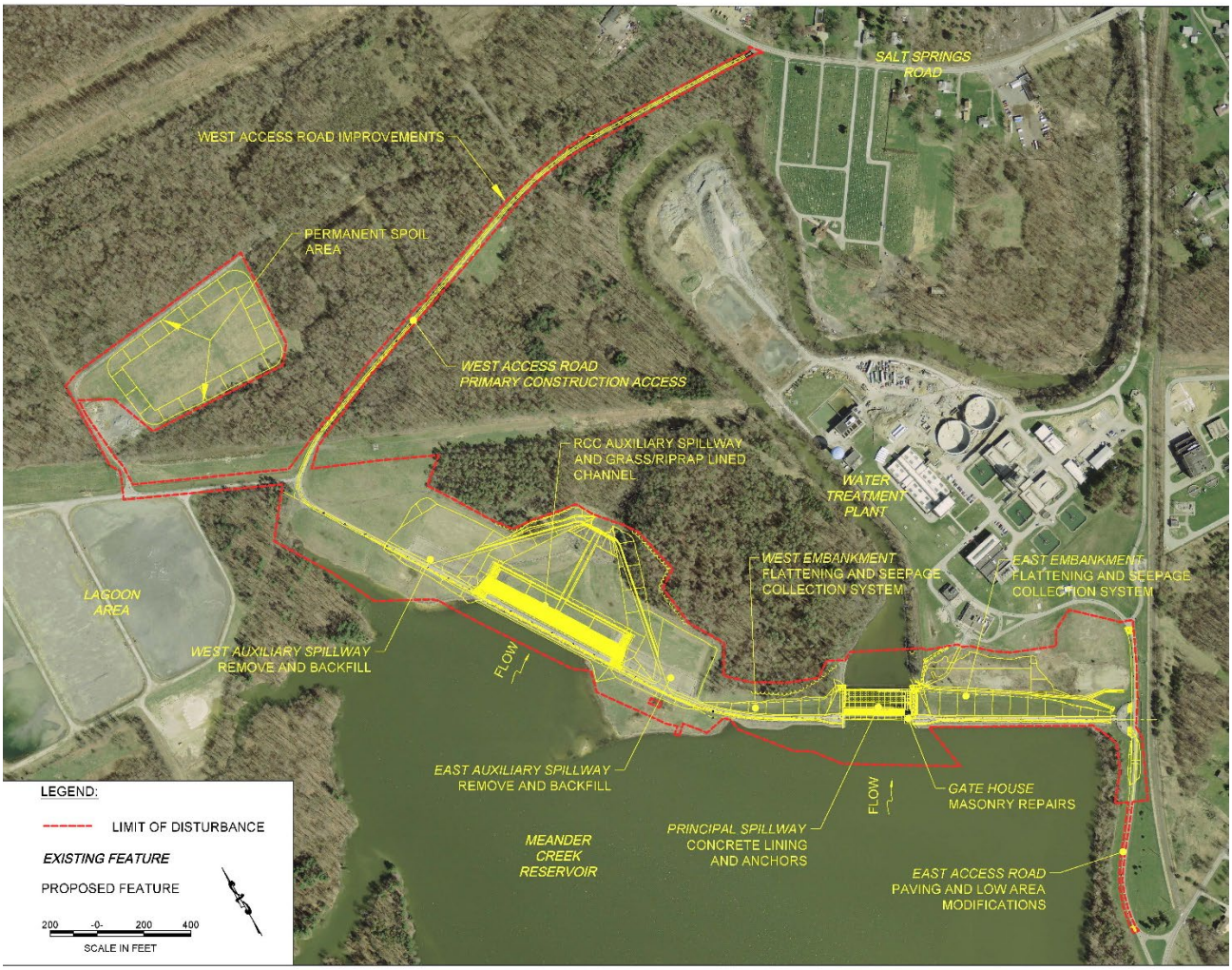
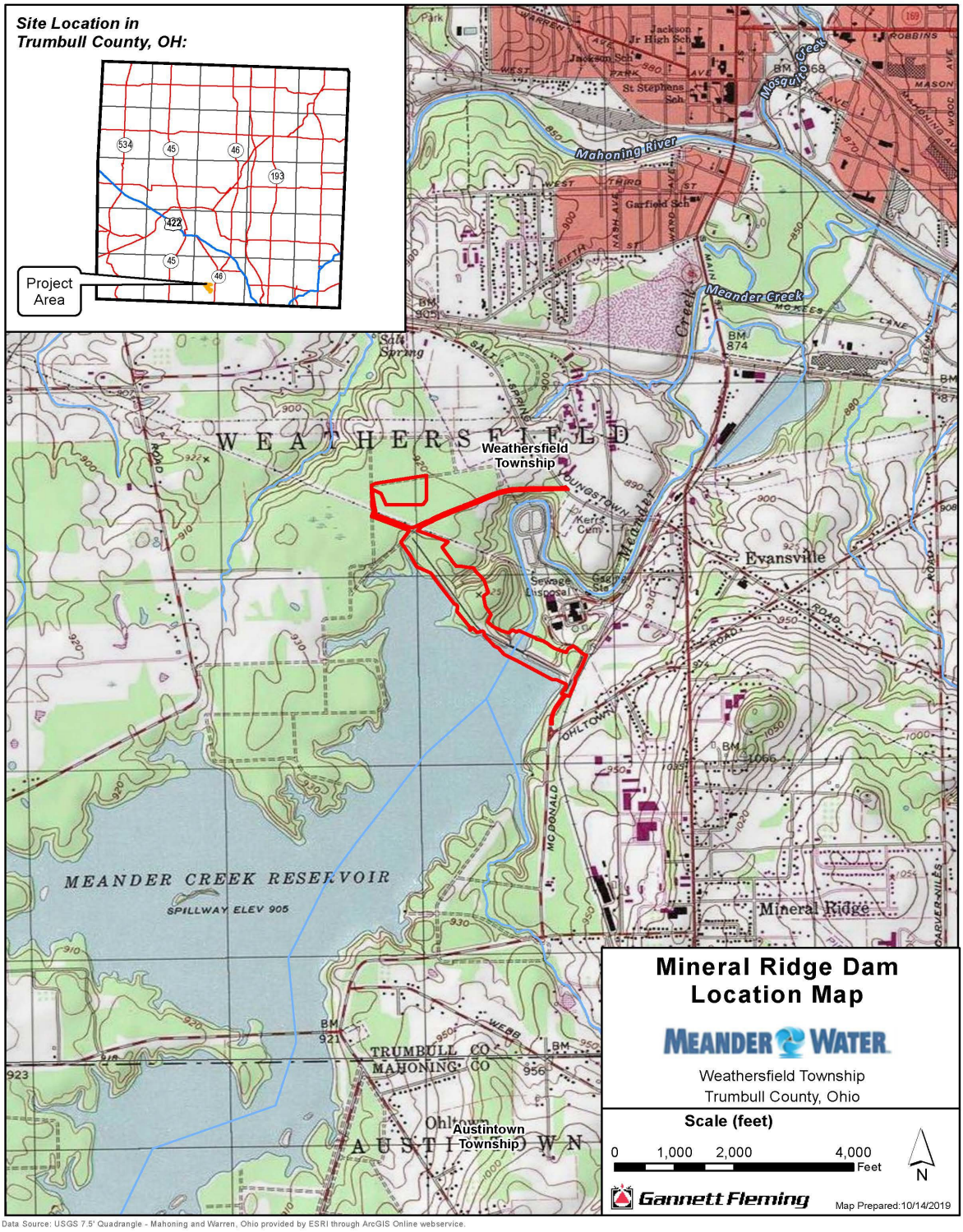


Exhibit 2: Specific Area of Potential Effect Project Location Topographic Map



3.1 Preliminary Screening of Assessment Categories:

The alternatives listed above are likely to result in impacts governed by the federal laws and executive orders listed below. Checked items will require closer coordination with the appropriate agencies to identify and mitigate potentially significant impacts.

- ☒ Clean Water Act (CWA)
- ☐ Clean Air Act (CAA)
- ☐ Coastal Barrier Resources Act (CBRA)
- ☐ Coastal Zone Management Act (CZMA)
- ☒ Endangered Species Act (ESA)
- ☒ Executive Order 11988 – Floodplains
- ☒ Executive Order 11990 – Wetlands
- ☒ Executive Order 12898 – Environmental Justice for Low Income & Minority Populations
- ☐ Executive Order 13112 – Invasive Species
- ☐ Farmland Protection Policy Act (FPPA)
- ☒ Executive Order 13175 – Consultation and Coordination with Indian Tribal Governments
- ☐ Migratory Bird Treaty Act (MBTA)
- ☒ National Historic Preservation Act (NHPA)

3.2 Reasonably Foreseeable Future Actions

At this time, there are no reasonably foreseeable future actions to Mineral Ridge Dam, along Meander Creek or Meander Creek Reservoir.

SECTION FOUR: REFERENCES

Gannett Fleming, Inc. Mineral Ridge Dam Weathersfield Township, Trumbull County, Ohio Preliminary Analysis and Evaluation Report NID ID No. OH-00337. March 2016.

Mineral Ridge Dam, OH, Technical Review Panel Meeting, December 18-20, 2017-TRP Report #01.

SECTION FIVE: AGENCY CONSULTATION

The Tribal Nations and Agencies listed below have been provided a copy of this document or will be notified of this project through FEMA Region 5 Standard consultation procedures as directed under individual Environmental laws and Executive Orders. Other State and Local Agencies and interested parties including local officials and organizations not listed below will also be provided with this scoping document.

Delaware Tribe of Indians

Seneca Nation of Indians

Seneca – Cayuga Nation

Nottawaseppi Huron Band of the Potawatomi

Ohio Historic Preservation Office

US Fish and Wildlife Service, Ohio Field Office

US Army Corps of Engineers, Pittsburgh District

US Environmental Protection Agency, Region 5

Ohio Environmental Protection Agency

Ohio Department of Natural Resources

SECTION SIX: FEMA CONTACT INFORMATION

Anyone interested in providing comment on this document may respond as noted below before September 26, 2022. Be sure to provide your name and contact information along with your comments.

Respond by Mail:

Federal Emergency Management Agency, Region 5

c/o Duane Castaldi, Regional Environmental Officer

536 South Clark Street, 6th Floor

Chicago, IL 60605-1521

Respond by Email:

Send comments to fema-r5-environmental@fema.dhs.gov.