Report to Congress for Future Water Resources Development (WRRDA 7001) Submission Package

Proposal Name: Miami Well Field Flood Mitigation Study

Submission Date: 08/09/2017

Proposal ID Number: 5189ba40-aa78-4dad-95c7-fec5e2c39e7c

Purpose of Proposal: The City of Dayton is proposing a feasibility study for the purpose of flood mitigatio n project to protect the Miami Well Field during times of high river levels of the Great Miami River.

1. Administrative Details

Proposal Name: Miami Well Field Flood Mitigation Study

by Agency: City of Dayton Water Department, Division of Water Supply and Treatment

Locations: OH

Date Submitted: 08/09/2017

Confirmation Number: 5189ba40-aa78-4dad-95c7-fec5e2c39e7c

Supporting Documents

File Name	Date Uploaded
ConsequencesAndAssetsReport (1) MWF.pdf	08/09/2017
Letter of Support City of Dayton MCD.pdf	08/09/2017
ClimateAwarenessReport MWF Flooding.pdf	08/09/2017
Letter Flood Mitigation Mayor.pdf	08/09/2017
WRRDA Proposal Support FRMP.PDF	08/09/2017
USACE Grant Application Support Letter EAB.pdf	08/09/2017
Miami-Well-Field-Map.pdf	08/09/2017

2. Provide the name of the primary sponsor and all non-Federal interests that have contributed or are expected to contribute toward the non-Federal share of the proposed feasibility study or modification.

Sponsor	Letter of Support
City of Dayton Water Department, Division of Water Supply and Treatment, Dayton, Ohio(Primary)	The Great Miami Buried Valley Aquifer is one of the largest and most productive aquifer systems in the country. Our regional aquifer resource is protected with and award winning source water protection program and sole source designation by the USEPA. Dayton and surrounding communities participate in the Source Water Protection Program which includes land use control zoning, ground water monitoring and remediation, emergency preparedness. The City of Dayton Water Department treats and pumps drinking water to approximately 440,000 peopled in Montgomery County and beyond. Water is supplied to treatment plants by two well fields, the Miami and Mad River Well Fields. The Water Department's proposal to investigate flood mitigation by installing "duckbill" style, all rubber check valves on storm sewers that flow in the Great Miami River. These valves would further increase the strength of our Program by helping to prevent flooding of the well fields and possible contaminants from spills entering the well field and recharge lagoons during high river flows.
Environmental Advisory Board	The City of Dayton Environmental Advisory Board is a composed of citizens who volunteer their time to advise the city environmental matters of concern. The City of Dayton and surrounding region are blessed with a clean and plentiful supply of groundwater which makes it a attractive for living and working in the area. Over the years, the city has enacted a robust set of protective measures to ensure this invaluable resource is maintained for all who depend on it.
Miami Conservancy District	The Miami Conservancy District has been actively involved in supporting community efforts to protect water resources in the Great Miami River Watershed for a long time. It is important for Dayton to have a means of preventing the Miami Well Field from flooding during high flow events.
Five Rivers Metroparks	Five Rivers Metroparks, with a purpose of protecting natural areas and parks and river corridors, is fully supportive of the City of Dayton Water Department's proposal for a Miami Well Field Flood Mitigation Study. We understand the proposal is to investigate flood mitigation by installing storm sewer check valves. This aligns with Five Rivers Metroparks mission of protecting the region's natural heritage and providing outdoor experiences.

3. State if this proposal is for a feasibility study, a modification to an authorized USACE feasibility study or a modification to an authorized USACE project. If it is a proposal for a modification, provide the authorized water resources development feasibility study or project name.

[x] Feasibility Study

4. Clearly articulate the specific project purpose(s) of the proposed study or modification. Demonstrate that the proposal is related to USACE mission and authorities and specifically address why additional or new authorization is needed.

The City of Dayton is proposing a feasibility study for the purpose of flood mitigation project to protect th e Miami Well Field during times of high river levels of the Great Miami River.

5. To the extent practicable, provide an estimate of the total cost, and the Federal and non-Federal share of those costs, of the proposed study and, separately, an estimate of the cost of construction or modification.

	Federal	**Non-Federal**	**Total**
Study	$20,000	$20,000	$40,000
Construction	$60,000	$60,000	$120,000

Explanation (if necessary)

6. To the extent practicable, describe the anticipated monetary and nonmonetary benefits of the proposal including benefits to the protection of human life and property; improvement to transportation; the national economy; the environment; or the national security interests of the United States.

The Miami Well Field, consisting of 36 water production wells, each capable of producing approximately 3 MGD, supplies drinking water treated at the Miami Water Treatment Plant for the City of Dayton and su rrounding communities and businesses. The Miami Water Treatment Plant is one of two City of Dayton dr inking water treatment plants that supplies drinking water to approximately 440,000 residents of Montgom ery County, Ohio including Dayton, Ohio. The Miami Water Treatment Plant and Miami Well Field lie along Great Miami River in Dayton Ohio. Although a levee, constructed between 1918 and 1922 by the Mi ami Conservancy District, protects the well field, four storm sewer outflows discharge to the river. At flood stage, the storm sewers are capable of backing up and flooding the wellfield and businesses adjacent to the Great Miami River. Currently 42 inch manually operated gate valves control the storm sewers, which Wat er Department employees close if a storm event is anticipated. The City of Dayton is seeking funds for a f easibility study and construction project to protect the Miami Well Field during times of flood stage. The City of Dayton Miami Well Field mitigation project would be an installation of "duckbill" style all rubber c heck valves on four 42" storm sewers outflows that discharge to the Great Miami River. During periods of high river levels, water backs up into the well field, flooding the well field, roads, and businesses. The addit ion of check valves to the storm sewer outfall could reduce the need to manually close the gate valves and r educe the potential for flooding. Due to global climate change, it is anticipated that there will be an incr eased frequency of heavy intense rain events increasing the potential for flooding. Using USEPA Climate R esilience Evaluation and Awareness Tool (CREAT) 3.0 it is predicted that average annual rainfall may inc rease 10.6% and a 21.2% increase in in 100-year storm by the year 2060. Economic impact from the loss of

7. Does local support exist? If 'Yes', describe the local support for the proposal.

[x] Yes

Local Support Description

Letters of Support for the Miami Well Field Flood Mitigation Study have been received from several Miam i Valley agencies in addition to the City of Dayton Mayor are the City of Dayton Environmental Advisory Board, the Miami Conservancy District, and Five Rivers Metro Parks. Each agency has a stake in the prot ection of the drinking water well field for the community. The USEPA has designated the Miami Valley B uried Aquifer as a sole source aquifer. The City of Dayton and surrounding communities are actively invol ved in and committed in a Source Water Protection Plan for many years, the Miami Well Field Flood Miti gation Study would further strengthen the region's protection efforts.

8. Does the primary sponsor named in (2.) above have the financial ability to provide for the required cost share?

[x] Yes

Additional Proposal Information

(This is as uploaded, a blank page will show if nothing was submitted)

ConsequencesAndAssetsReport (1) MWF.pdf

Consequences and Assets for City of Dayton Water - Miami WTP

Changing climate conditions may impact utility assets that can have a number of different consequences, including loss of operating revenue and equipment damage, water quality, environmental and health consequences. The assets and consequences listed below were identified by City of Dayton Water - Miami WTP for consideration in assessing the potential impacts from climate change.

Utility Information

System Type:	Water Only
Volume Treated (Million Gallons per day [MGD]):	30
Population Served:	140,000
Financial Condition:	Good

Asset/Threat List for City of Dayton Water - Miami Well Field

Asset Name	Assigned Threat
Buildings And Offices	**Floods**
Miami Well Field	**Floods**

Economic Consequence Matrix for City of Dayton Water - Miami WTP

Levels	Utility Business Impacts Operating revenue loss evaluated in terms of the magnitude and recurrence of service interruptions. Consequences range from long-term loss of expected operating revenue to minimal potential for any loss.	Utility Equipment Damage Costs of replacing the service equivalent provided by a utility or piece of equipment evaluated in terms of the magnitude of damage and financial impacts. Consequences range from complete loss of the asset to minimal damage to the equipment.	Environmental Impacts Evaluated in terms of environmental damage or loss, aside from water resources, and compliance with environmental regulations. Consequences range from significant environmental damage to minimal impact or damage.	Source/Receiving Water Impacts Degradation or loss of source or receiving water quality or quantity evaluated in terms of recurrence. Consequences range from long-term compromise to no more than minimal changes to water quality or quantity.
Very High	Long-term or significant loss of expected revenue or operating income	Complete loss of asset	Significant environmental damage	Long-term compromise of source water quality or quantity
	> $8,310,000	**> $10,470,000**	**> $558,600**	**> $3,196,200**
High	Seasonal or episodic compromise of expected revenue or operating income	Significant damage to equipment	Persistent environmental damage	Seasonal or episodic compromise of source water quality or quantity
	$5,550,000 - $8,310,000	**$4,380,000 - $10,470,000**	**$232,400 - $558,600**	**$1,331,400 - $3,196,200**
Medium	Minor and short-term reductions in expected revenue	Minor damage to equipment	Short-term damage, compliance can be quickly restored	Temporary impact on source water quality or quantity
	$2,760,000 - $5,550,000	**$1,740,000 - $4,380,000**	**$93,800 - $232,400**	**$533,400 - $1,331,400**
Low	Minimal potential for loss of revenue or operating income	Minimal damage to equipment	No impact or environmental damage	No more than minimal changes to water quality
	$0 - $2,760,000	**$0 - $1,740,000**	**$0 - $93,800**	**$0 - $533,400**

Public Health Consequences

Public health impacts are assessed in terms of number of fatalities and number of injuries. CREAT records a Value of Statistical Life (VSL) per fatality and Value of Statistical Injury (VSI) per injury in order to monetize public health impacts.

Value of Statistical Injury (VSI) = **$79,000**
Value of Statistical Injury (VSI) is the value attributed to each injury assessed due to the occurrence of a threat to a particular asset.

Value of Statistical Life (VSL) = **$7,900,000**
Value of Statistical Life (VSL) is the value attributed to each fatality assessed due to the occurrence of a threat to a particular asset.

Other Non-Federal Sponsors Letter(s) of Support

(This is as uploaded, a blank page will show if nothing was submitted)

Letter of Support City of Dayton MCD.pdf

MCD
MIAMI CONSERVANCY DISTRICT

38 E. Monument Ave.
Dayton, OH 45402
(937) 223-1271

July 25, 2017

David E. Lawrence
Department of Water
Water Administration | City of Dayton
320 West Monument Avenue
Dayton, Ohio 45402

Dear Mr. Lawrence,

The Miami Conservancy District is pleased to learn that you are seeking funding support from the U.S. Army Corps of Engineers for flood mitigation at the Miami Well Field.

As you know, we have been actively involved in supporting community efforts to protect water resources in the Great Miami River Watershed for a long time. The Great Miami River is a potential source of contaminants to the Miami Well Field, particularly if a spill occurred. It's important for Dayton to have a means of preventing the Miami Well Field from flooding during high river flows. Installing "duckbill style" rubber check valves on the storm sewers that flow from the Miami Well field into the Great Miami River would allow Dayton to prevent contaminants in the river from entering the recharge lagoons during high river flows.

We are pleased you are applying for the U.S. Army Corps of Engineers grant, and we support your efforts.

Sincerely,

Michael P. Ekberg
Manager Water Resource Monitoring and Analysis

Additional Proposal Information

(This is as uploaded, a blank page will show if nothing was submitted)

ClimateAwarenessReport MWF Flooding.pdf

Climate Awareness Report

Potential future climate conditions for City of Dayton Water - Miami Well Field

Climate change presents challenges to water, wastewater and stormwater utilities and the communities they serve. Those utilities that adapt to these changes may need to raise rates to develop new water supplies and adjust their treatment and operations. Without adaptation, infrastructure and operations designed for historical climate conditions could be overwhelmed or damaged. Main breaks, overflows, and service outages would lead to lost local business revenue and public health concerns. Several changes are possible for your utility's location and each future has unique challenges to consider:

What if the climate were significantly hotter?

5.99°F increase in average annual temperature and
12.95 days over 100 °F per year by 2060

- Adjust treatment processes to warmer waters and altered water quality
- Utility crews and equipment stressed during hot days
- Increased demand during hot days exceeding supply leads to outages and public health risks
- Larger wildfires and damage to infrastructure and water resources under hotter conditions

What if the climate were significantly wetter?

10.6% change in annual precipitation and
21.21% increase in 100-year storm by 2060

- Strained reservoirs, overwhelmed treatment and flooded facilities during sustained and intense storm events
- Adjust treatment processes to lesser quality inflow due to soil erosion and contaminants from overland flows
- Flooded streets and basements throughout the community following heavy precipitation events
- Health risk from Combined Sewer Overflows (CSOs) and Sanitary Sewer Overflows (SSOs)

What if the climate were significantly drier?

-0.94% change in annual precipitation by 2060

- Revenue loss from reduced usage during voluntary or mandatory conservation actions in response to drought
- Operational changes to increase efficiency, conserve and access alternate supplies during intense drought
- Disrupted historical storage cycles in aquifers, reservoirs and snowpack
- Larger wildfires and damage to infrastructure and water resources under hotter conditions

The Climate Resilience Evaluation and Awareness Tool (CREAT) is a risk assessment and scenario-based planning application for water, wastewater, and combined utilities of all sizes. CREAT provides users with access to basic climate science information and a framework to gauge climate-related risk reduction following the implementation of different adaptation strategies. Results can be incorporated into asset planning and water-resource management efforts to build resilience at their utility.

Please review the Climate Change Scenarios and Data chapter in the CREAT Methodology Guide for more information on the climate science data provided in the tool, which incorporates the same models and overall conclusions in the U.S. Global Change Research program's 2014 National Climate Assessment, as well as methods used to provide projections in CREAT.

For more information on CREAT, visit EPA's Creating Resilient Water Utilities initiative.

Primary Sponsor Letter of Support

(As uploaded)

Letter Flood Mitigation Mayor.pdf

NAN WHALEY
MAYOR

OFFICE OF THE MAYOR
CITY HALL • 101 WEST THIRD STREET
P.O. BOX 22 • DAYTON, OHIO 45401
(937) 333-3636 • www.daytonohio.gov

July 28, 2017

Mr. Mark Toy
Brigadier General, U.S. Army
Division Commander
U.S Army Corps of Engineers,
Great Lakes & Ohio River Division
550 Main Street, Room 10524
Cincinnati, OH 45202-3222

Re: City of Dayton, Ohio Water Department WRRDA Proposal

Dear BG Toy:

I am pleased to support the City of Dayton Water Department as they pursue congressional authorization for future water resource development activities through the Water Resources Reform and Development Act. Specifically, the proposal is for a Miami Well Field Flood Mitigation Study.

The Great Miami Buried Valley Aquifer is one of the largest and most productive aquifer systems in the country. Our regional aquifer resource is protected with an award winning source water protection program and sole source aquifer designation by the U.S. Environmental Protection Agency. Dayton and surrounding communities participate in the Source Water Protection Program which includes land use control zoning, groundwater monitoring and remediation, and emergency preparedness.

The City of Dayton Water Department treats and pumps drinking water to approximately 440,000 people in Montgomery County and beyond. Water is supplied to treatment plants by two well fields, the Miami and Mad River Well Fields. The Water Department's proposal is to investigate flood mitigation by installing "duckbill" style, all rubber check valves on storm sewers that flow in the Great Miami River. These valves would further increase the strength of our Program by helping to prevent flooding of the wellfields and possible contaminants from spills from entering the well field and recharge lagoons during high river flow.

Sincerely,

Nan Whaley

Nan Whaley
Mayor

Other Non-Federal Sponsors Letter(s) of Support

(This is as uploaded, a blank page will show if nothing was submitted)

WRRDA Proposal Support FRMP.PDF

FIVE RIVERS METROPARKS

409 E. Monument Ave.
Third Floor
Dayton, Ohio 45402-1260

Phone (937) 275-7275
Fax (937) 278-8849

metroparks.org

August 3, 2017

Mr. Mark Toy
Brigadier General, U.S. Army
Division Commander
U.S Army Corps of Engineers,
Great Lakes & Ohio River Division
550 Main Street, Room 10524
Cincinnati, OH 45202-3222

Re: City of Dayton, Ohio Water Department WRRDA Proposal

Dear BG Toy:

Five Rivers MetroParks, with a purpose of protecting natural areas and parks and river corridors, is fully supportive of the City of Dayton Water Department's proposal for a Miami Well Field Flood Mitigation Study. We hope you will give serious consideration to their study as they pursue congressional authorization for future water resource development activities through the Water Resources Reform and Development Act.

We understand that the Water Department's proposal is to investigate flood mitigation by installing "duckbill" style, all rubber check valves on storm sewers that flow into the Great Miami River. The installation of these valves aligns with our mission of protecting the region's natural heritage and providing outdoor experiences that inspire a personal connection with nature. Our waterways are a vital part of our recreation system and keeping them and our source water free of debris and contaminants is very important; the valves would help with that effort and we are happy to support the City's efforts.

Sincerely,

Carrie Scarff
Chief of Planning & Projects

Other Non-Federal Sponsors Letter(s) of Support

(This is as uploaded, a blank page will show if nothing was submitted)

USACE Grant Application Support Letter EAB.pdf

Environmental Advisory Board
Dayton, Ohio

July 25, 2017

To Whom It May Concern:

I am writing on behalf of the City of Dayton Environmental Advisory Board (EAB) in support of the City's grant application for funding of its Miami Well Field mitigation project. The EAB provides advice and input to the City Commission and City management on matters pertaining to environmental issues facing the City and is composed of citizens who volunteer their time and talents to ensure the environment in Dayton is protected for both residents and businesses.

The City of Dayton and surrounding region are blessed with a clean and plentiful supply of groundwater which makes it attractive for living and working in the area. Over the years, the City has enacted a robust set of protective measures to ensure that this invaluable resource is maintained for all who depend upon it. A significant component of this effort resulted from a unique collaboration among the municipalities in the region who benefit from the groundwater supply and who have passed their own ordinances to ensure its protection. In fact, the program has become a national model for other cities/regions to follow in protecting their water resources.

As the major supplier of water for Dayton and much of the surrounding area, the City of Dayton is charged with the substantial responsibility of making sure the groundwater is not only clean but plentiful. To this end, in addition to the protective measures mentioned above, the City has established groundwater recharge basins to allow surface water collected from clean sources of rain and storm water runoff to replenish the aquifer. It is the protection of these sources of recharge to the basins which is the subject of this grant application.

The EAB fully supports the funding of this application.

Sincerely,

Scott Arentsen /mgw

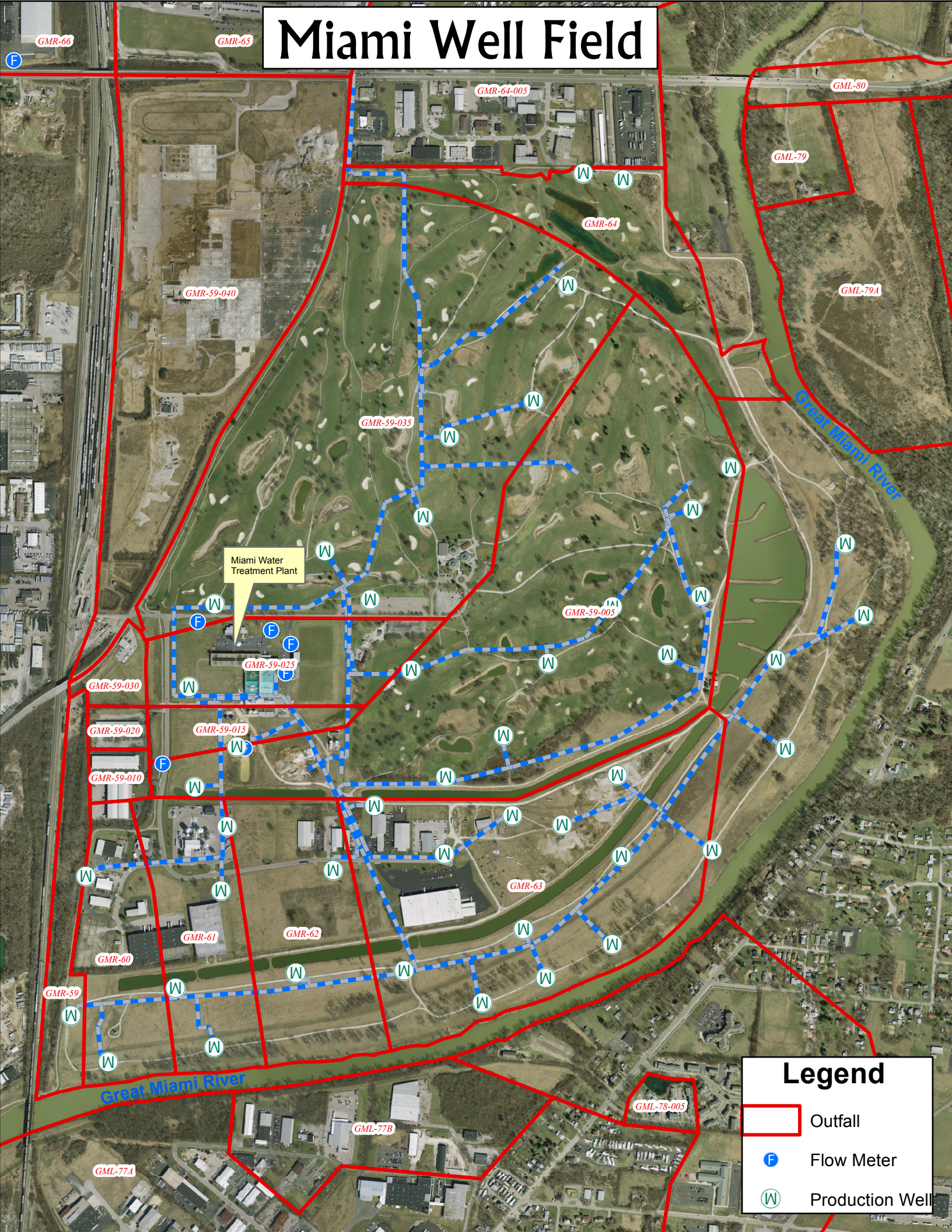
Scott Arentsen, Chair
City of Dayton
Environmental Advisory Board

(937) 333-3734 • P.O. Box 22, Dayton, OH 45401

Map Document

(This is as uploaded, a blank page will show if nothing was submitted)

Miami_Well_Field_Map.pdf


Miami Well Field
GMR-66
GMR-65
GMR-64-005
GML-80
GML-79
GMR-64
GMR-59-040
GML-79A
Great Miami River
GMR-59-035
Miami Water Treatment Plant
GMR-59-005
GMR-59-025
GMR-59-030
GMR-59-020
GMR-59-015
GMR-59-010
GMR-63
GMR-61
GMR-62
GMR-60
GMR-59
Great Miami River
GML-78-005
GML-77B
GML-77A
Legend
Outfall
Flow Meter
Production Well