

# UPPER BLANCHARD FLOOD RISK MANAGEMENT EAGLE CREEK DRY STORAGE BASIN

## Preliminary Report

The City of Findlay (City) and the Hancock County Commissioners (County) engaged the US Army Corps of Engineers in 2007 to develop a plan for reducing damages caused by the increasing frequency of flooding on the Blanchard River and its tributaries. The result of the Corps study recommended a diversion channel to be constructed south and west of the City from Eagle Creek to the Blanchard River, however, the project did not meet the requirements to pursue Federal funding assistance. Consequently, the County, City, and a coalition of Findlay businesses and citizens supportive of flood risk reduction (Blanchard River Watershed Solutions (BRWS) requested the assistance of the Maumee Watershed Conservancy District (MWCD) to determine if a cost effective local plan for flood risk management could be implemented. The urgency to pursue flood risk reduction has been amplified by the occurrence of six (6) flood events in the past twelve (12) years that rank in the top ten highest recorded floods since 1913.

The County, using funds provided by a ¼% flood mitigation sales tax, contracted with Stantec Consulting Services Inc in 2016 to review the Corps recommendation and also consider other flood risk reduction projects. Stantec issued a Proof of Concept report in 2017 that proposed the following projects:

1. Excavation of the north side of the Blanchard River in the City between Broad Avenue and the Norfolk Southern (NS) railroad bridge to increase the floodplain capacity.
2. Modification or expansion of the NS railroad bridge over the Blanchard to increase the capacity of flow through the structure.
3. Construction of dry storage basins upstream of the City on the Blanchard River and Potato Run near the Village of Mount Blanchard and a third basin on Eagle Creek just south of the US 68/SR 15 interchange. The storage basins would be constructed of earthen embankments to impound floodwater during rain events and release the floodwaters slowly thus reducing the water surface elevations downstream of the basins.

Project 1 is currently nearing completion. Final engineering has begun on Project 2 including consultation with NS. The most cost effective dry storage basin concept proved to be on Eagle Creek and, thus, is the subject of this report.

The cost/benefit analysis (BCA) prepared with the Proof of Concept report was calculated at 2.21 if all recommended projects were constructed.

In December 2018, through the efforts of BRWS, State Senator Rob McColley, and State Representative Jon Cross, the Ohio General Assembly approved legislation providing \$ 15 million in funding for “Eagle Creek Watershed Flood Mitigation”. The Ohio Department of Natural Resources (ODNR) was tasked with administering

the grant and MWCD was appointed as the grantee. In June, 2019, MWCD authorized the submittal of a Project Information Package to ODNR to secure the release of the grant from the Ohio Controlling Board. Also in June, 2019, MWCD contracted with Stantec to develop preliminary engineering of the Eagle Creek dry storage basin concept.

Stantec issued a preliminary engineering technical memo in November, 2019. A synopsis of the memo is as follows:

- The proposed basin would be located in sections 1 & 2 of Eagle Township.
- Soil borings indicate native soils can be used for embankments.
- Sixteen (16) different configurations of the storage basin were analyzed ranging in size from 572 acres to 933 acres. Two (2) outflow rates were also used in the analysis, 1,100 cubic feet per second (CFS) and 500 CFS. For comparison, the flow rate in Eagle Creek during a 1% Annual Chance Event (ACE) or 100-year storm is 4,000 CFS.
- The constructed basin will require the vacation and relocation of Eagle Township Road 49. Four (4) alternatives for this work were submitted to the Ohio Department of Transportation for their review and consultation.
- Two (2) residences will need to be acquired and demolished. Three (3) additional residences may need to be acquired and demolished depending on the final selected basin configuration.
- Preliminary coordination has taken place with the Ohio Historical Preservation Office (OHPO), the Ohio Department of Natural Resources (ODNR), and the US Fish & Wildlife Service (USFWS) to determine potential impacts to identified wetlands, cultural and environmental resources, and threatened or endangered species. No significant adverse impacts have been discovered during this preliminary investigation.
- Opinions of Probable Construction Cost, including a 25% contingency, were calculated for each of the 16 configurations.
- An analysis was performed to determine the effectiveness of diverting up to 500 CFS from the basin to Aurand Run, another tributary of the Blanchard with headwaters just west of the proposed basin location. This option would require improvements to Aurand Run including enlarging existing bridges and culverts and excavation along both banks of Aurand Run above the Ordinary High Water level to provide capacity for the increased flow. The diversion of flow to Aurand Run would only occur when flooding exceeded the 2% ACE (50-year storm).
- The cost effectiveness of the basin improves as the footprint of the basin gets larger, primarily due to less soil excavation needed to provide sufficient holding capacity. A larger basin also minimizes the need for a secondary outlet to Aurand Run.

Further review of the Aurand Run option determined increasing the storage capacity of the basin would be more cost effective than making the necessary improvements to Aurand Run.

If constructed, the basin is estimated to reduce the water surface elevation on Main Street in Findlay at the Blanchard during a 1% ACE by up to 1.5' with the 1,100 CFS outflow option or 1.7' with the 500 CFS outflow option. Approximately 2,000 acres would be removed from the FEMA regulatory floodplain (1,950 parcels).

An updated cost/benefit analysis completed for the Eagle Creek basin alone returned a ratio of 2.20 to 1.

In early 2020, using proceeds of the initial \$15 million grant, 417 acres of property was received by assignment through purchase offers obtained by Blanchard River Watershed Solutions in Sections 1 & 2 of Eagle Township. BRWS had appraisals performed by ODNR certified appraiser that were subsequently reviewed and approved by ODNR's appraisal reviewer. Phase 1 environmental studies were completed for each parcel as well as ALTA surveys in compliance with ODNR regulations.

A second \$15 million grant was approved by the General Assembly in December, 2020. Sufficient funds are now available to complete property acquisition and detailed design. Additional grants from the State will be pursued that should enable full funding of construction for the proposed storage basin.

Annual operation and maintenance costs of the completed basin are estimated to be \$100,000. O&M will include mowing, debris removal following flood events, upkeep/repair of the outlet structure and emergency spillway and maintenance of public access locations required to comply with ODNR access requirements. The City of Findlay is considering offering assistance with annual O&M. MWCD will need to follow the required procedures to establish a maintenance assessment on benefitted properties in order to collect the necessary funds.

In conclusion, the benefits for this project are as follows:

- The storage basin provides the most effective flood risk reduction in the Upper Blanchard watershed
- The project has a positive cost/benefit ratio of 2.2 to 1.
- The water surface elevation during flooding conditions will be reduced by 1.5 feet in downtown Findlay.
- 2,000 acres downstream of the basin will be removed from the FEMA regulated flood plain.
- 1,950 parcels will no longer be required to be covered by flood insurance.
- 50% of the property needed to construct the basin has been acquired

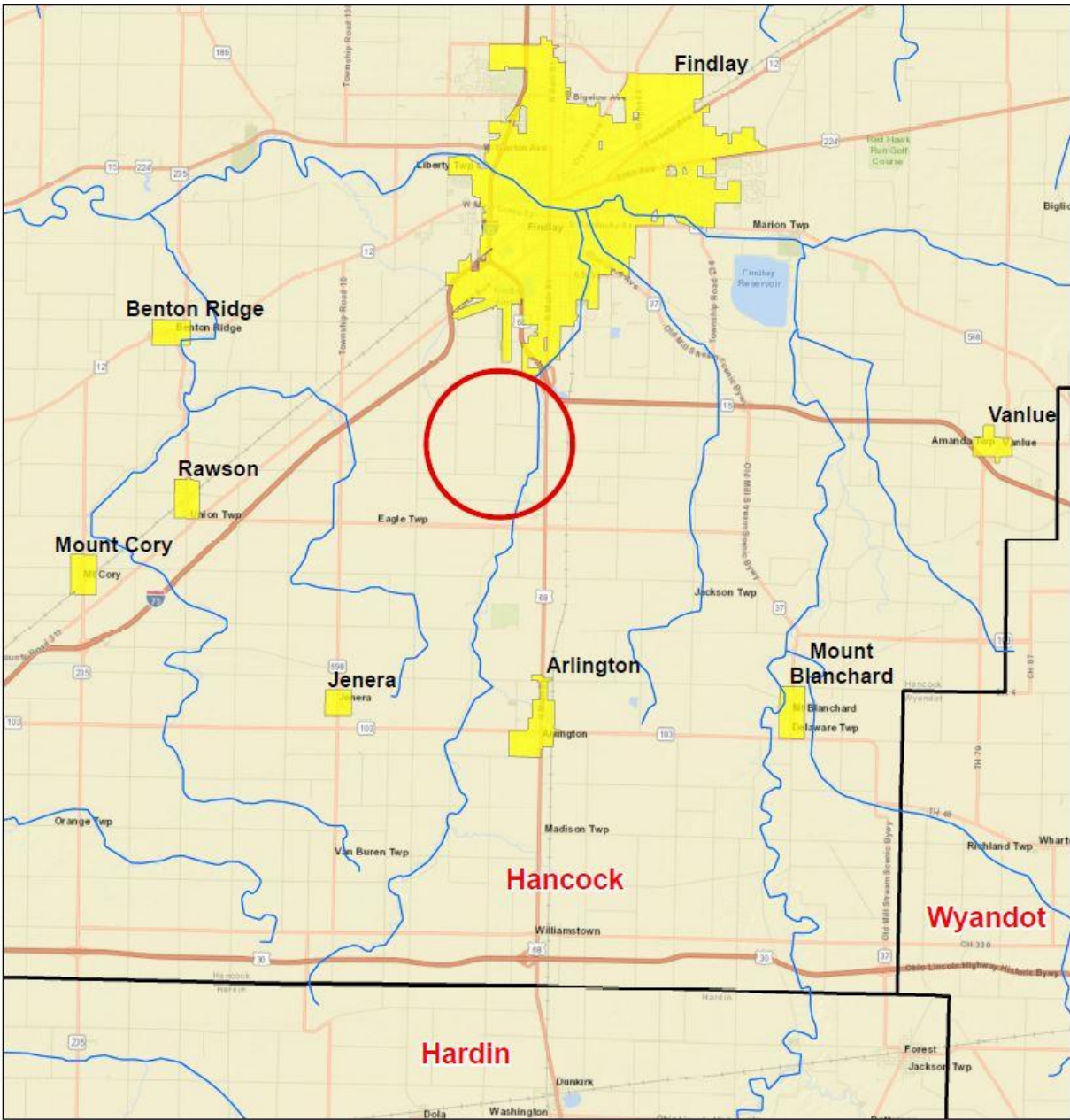
Four (4) attachments are included with this report. The 1<sup>st</sup> identifies the preliminary location of the proposed storage basin. The 2<sup>nd</sup> identifies properties that are targeted

for acquisition. The 3<sup>rd</sup> attachment is a preliminary budget for the work. The 4<sup>th</sup> attachment characterizes the estimated change in the floodplain if the work is completed.

Respectfully Submitted,

*Steven C Wilson*

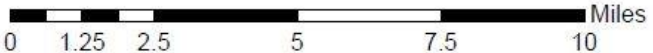
Steven C. Wilson, PE, PS  
Project Manager

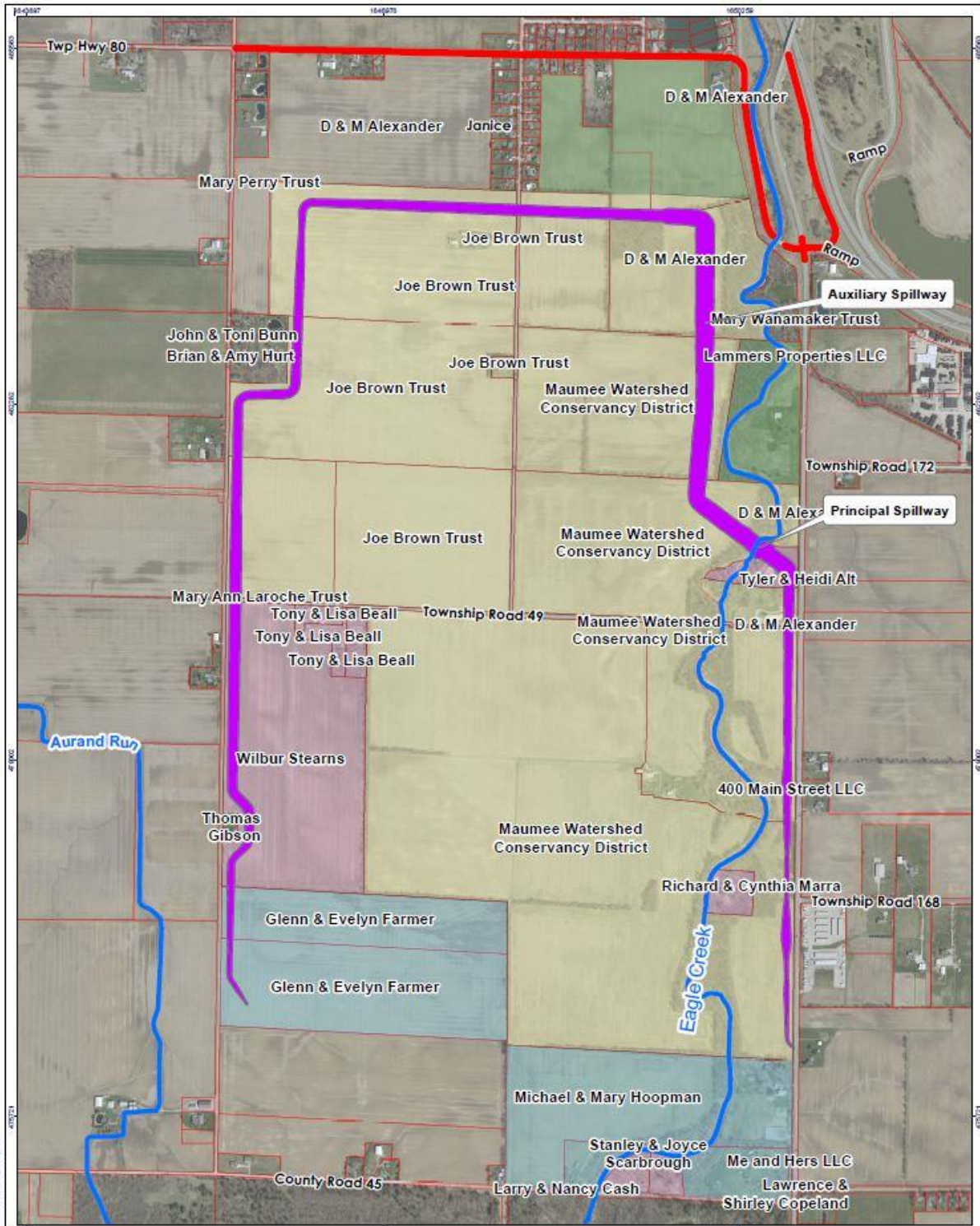


**Site Vicinity Map**  
**Eagle Creek Dry Storage Basin**  
**Eagle Township**  
**Hancock County, Ohio**

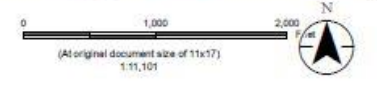
**Legend**

- Corporation Lines
- County





- Legend**
- Preliminary Design Embankment
  - Proposed Roadway Modifications to Replace Township Road 49 Crossing
  - Stream Centerline
  - Flowage/Construction Easement
  - In Discussion
  - MWCD Owned/Purchase Agreement
  - To Be Determined
  - Other Parcels



Project Location  
 City of Findlay and Eagle Township  
 Hancock County, Ohio

Prepared by DTH on 2021-03-01  
 TR by ACS on 2021-03-01

Client/Project  
 Maumee Watershed Conservancy District  
 Hancock County Flood Risk Reduction Program  
 Eagle Creek Dry-Storage Basin Preliminary Design

Figure No. 17340990 REVK

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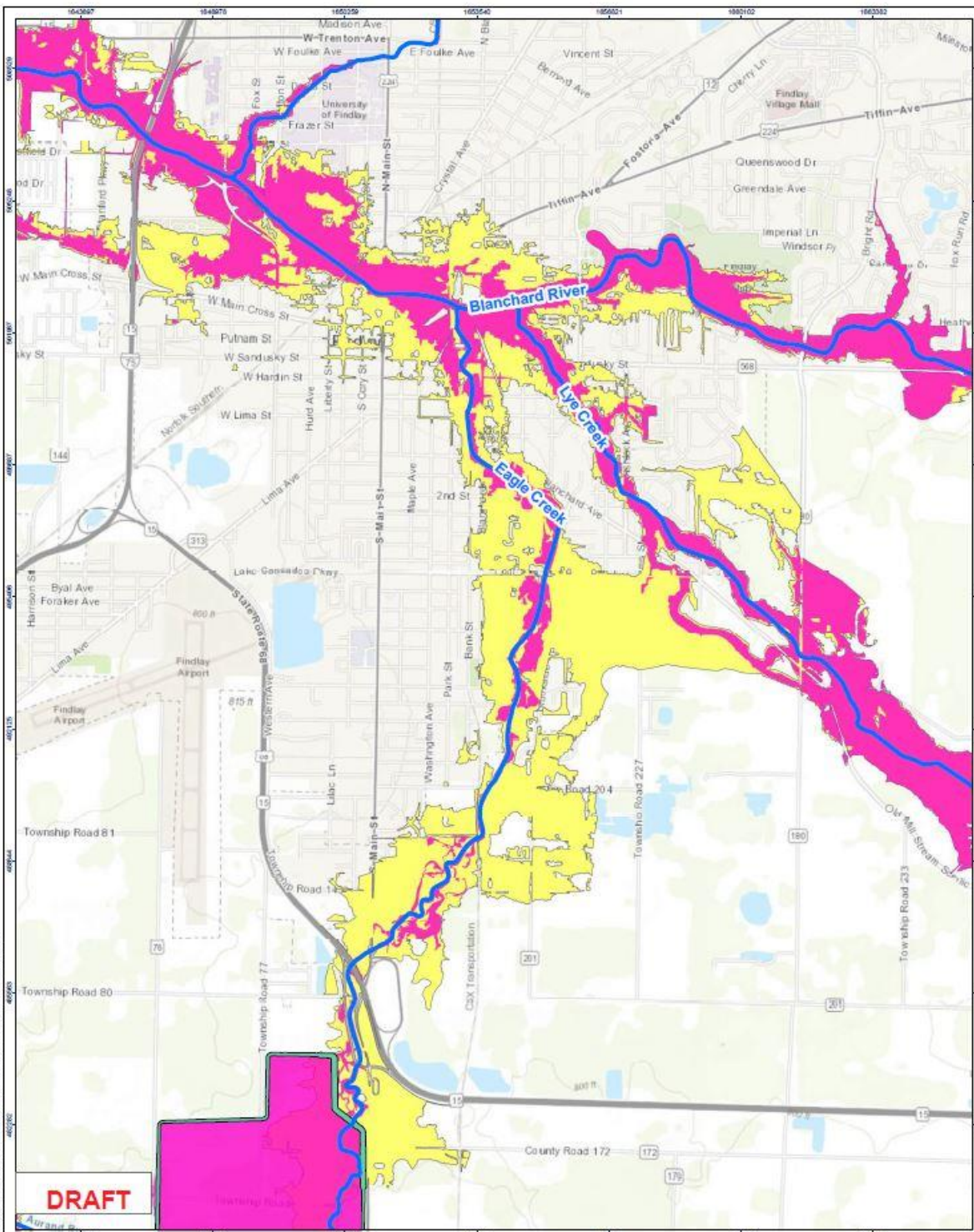
**Notes**

1. Coordinate System: NAD 1983 2011 StatePlane Ohio North FIPS 3401 FIPS
2. Data Source:
3. Background: Source: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the

Title  
**Eagle Creek at Dry-Storage Basin**

Eagle Creek Dry Storage Basin  
Opinion of Probable Construction Cost  
Configuration Option 2B

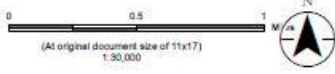
Basin Earthwork	\$ 12,000,000	
Seepage Mitigation	2,600,000	
Road & Bridge Modifications	4,300,000	
Spillway & Outlet Structure	<u>7,000,000</u>	
Construction Subtotal		\$ 25,900,000
Construction Contingency (25%)	\$ 6,475,000	
Mobilization, Site Prep, Utilities	<u>3,300,000</u>	
Construction Total		\$ 35,675,000
Land & Structures	\$ 25,400,000	
Environmental Mitigation	1,800,000	
Engineering Design & Permitting	5,000,000	
Construction Oversight & Admin	<u>2,400,000</u>	
Subtotal		\$ 34,600,000
<b>Total Probable Construction Cost</b>		<b>\$ 70,275,000</b>



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- Legend**
- Stream Centerline
  - Eagle Creek Dry-Storage Basin 1B Alignment
  - Eagle Creek Dry-Storage Basin - 1% ACE WSE
  - Existing Conditions - 1% ACE WSE



Project Location: City of Findlay and Eagle Township, Hancock County, Ohio  
 Prepared by DTI on 2019-12-03  
 TR by ACG on 2019-12-04  
 in Review by JRM on 2019-12-04  
 Drawn/Project: TRC/MSM/RSK

Maumee Watershed Conservancy District  
 Hancock County Flood Risk Reduction Program  
 Eagle Creek Dry-Storage Basin Conceptual Design  
 Figure No. **DRAFT**

Title:  
**Floodplain Comparison, Eagle Creek at  
 Dry-Storage Basin**

Name: findlay\TASL17\03\2019\findlay\findlay\_eagle\_creek\_1b\_conceptual\_design\findlay\_eagle\_creek\_1b\_conceptual\_design\findlay\_eagle\_creek\_1b\_conceptual\_design.dwg - revised 2019-12-03 by: dgrayson