



## Alternatives Analysis

### Wittmann Area Drainage Master Plan—McMicken Dam Project

The McMicken Dam Project was originally constructed to protect Luke Air Force Base and surrounding agricultural lands from flooding. However, since the initial construction, considerable development has occurred downstream from the dam.

The District is considering rehabilitating the McMicken Dam Project in order to extend its useful life, maintain flood control benefits to downstream properties, and comply with state dam safety requirements.

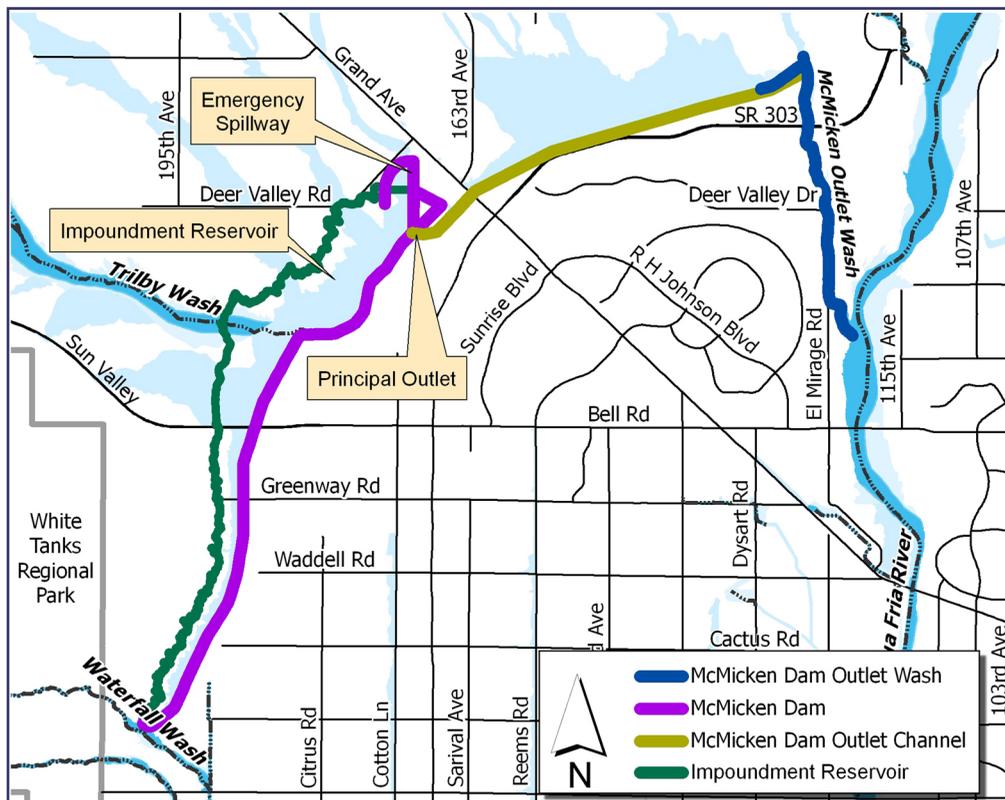
The project consists of McMicken Dam as well as the McMicken Dam Outlet Channel and McMicken Dam Outlet Wash. The McMicken Dam is an earthen dam approximately 10 miles long and 34 feet high, located within the city of Surprise between Peoria Avenue and Happy Valley Road.

Other elements typical of a dam include an impoundment reservoir, a low-flow channel, a principal outlet, and an emergency

spillway, which serves as a bypass when the water in the impoundment reservoir exceeds the flood storage capacity of the dam.

The overall purpose of the Wittmann ADMP is to develop, analyze, and select alternatives that will alleviate existing and potential drainage problems throughout the study area. McMicken Dam is the most significant and complex regional flood protection structure within the Wittmann ADMP study area.

The purpose of the McMicken Dam Project alternatives analysis is to develop feasible alternatives for the rehabilitation or decommissioning of McMicken Dam that address dam safety deficiencies and maintain adequate flood protection downstream of the current dam. The McMicken Dam principal outlet, emergency spillway, outlet channel, and outlet wash would be rehabilitated, or modified to maximize the system performance.



**Numerous alternatives were considered. The top seven advanced in the evaluation process and then narrowed to three alternatives: 1, 2, and 4.**

**Alternative No. 1**

Dam Rehabilitation

**New Facilities:** None

**Decommissioned Facilities:** None

**Rehabilitation of Existing Facilities:** Includes rehabilitation of all portions of the system including the entire dam, the principal outlet, the emergency spillway, the outlet channel, and the outlet wash. This rehabilitation will address all structural deficiencies and also take into consideration aesthetic elements that would allow the final structure to blend better with the surrounding area.

**Alternative No. 2**

Replace Dam South of Bell Road with Basins and/or Channels

**New Facilities:** Requires construction of basins or channels to provide flood protection to the area downstream from the decommissioned portion of the dam. Additionally, a new end of dam would be constructed at or near the Sun Valley Parkway (Bell Road) crossing. Three scenarios were analyzed:

- 2a) Consists of replacement of the south portion of McMicken Dam with 500-year basins
- 2b) Channels
- 2c) A combination of basins and channels

These alternatives whenever possible avoid placement of new basins in areas identified as potential fissure risk zones.

Additional facilities will need to be constructed for option 2b to take care of drainage generated between

the new channel and the old McMicken Dam. This structure will be further evaluated.

**Decommissioned Facilities:** This alternative decommissions the south portion of the dam. A substantial portion of District lands in the impoundment pool would no longer be needed for flood control.

**Rehabilitation of Existing Facilities:** Requires the rehabilitation of the north portion of the dam and the principal outlet, emergency spillway, outlet channel, and outlet wash.

**Alternative No. 4**

Segment Dam at One or More Locations

**New Facilities:** Requires construction of a new end of dam at each segment and the associated principal outlets and emergency spillways.

**Decommissioned Facilities:** None

**Rehabilitation of Existing Facilities:** Requires the rehabilitation of the entire dam and the principal outlet, emergency spillway, outlet channel, and outlet wash. Segment sections will vary in size and specific separation locations will be determined further in the evaluation process.

**For More Information contact:**

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**Estimated Schedule for Wittmann Area Drainage Master Plan (ADMP)**

	2005		2006				2007				2008			
	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr
<b>ADMP</b>	[Dark blue bar spanning from 3rd Qtr 2005 to 4th Qtr 2007]													
<b>McMicken Dam Project</b>	[Dark blue bar spanning from 2nd Qtr 2006 to 4th Qtr 2007]													
Fissure Investigation	[Dark blue bar spanning from 3rd Qtr 2005 to 3rd Qtr 2007]													
Secondary Analysis	[Dark blue bar spanning from 2nd Qtr 2006 to 3rd Qtr 2007]													
Tertiary Analysis	[Dark blue bar spanning from 2nd Qtr 2006 to 4th Qtr 2007]													
Failure Modes and Effects Analysis (FMEA)	[Small dark blue square in 1st Qtr 2008]													
Final Analysis	[Dark blue bar spanning from 3rd Qtr 2007 to 4th Qtr 2008]													
Public Meetings	[Green starburst icons in 4th Qtr 2006, 2nd Qtr 2007, and 1st Qtr 2008]													