

ODNR (6)
Report
11/18/15



DAM SAFETY INSPECTION REPORT

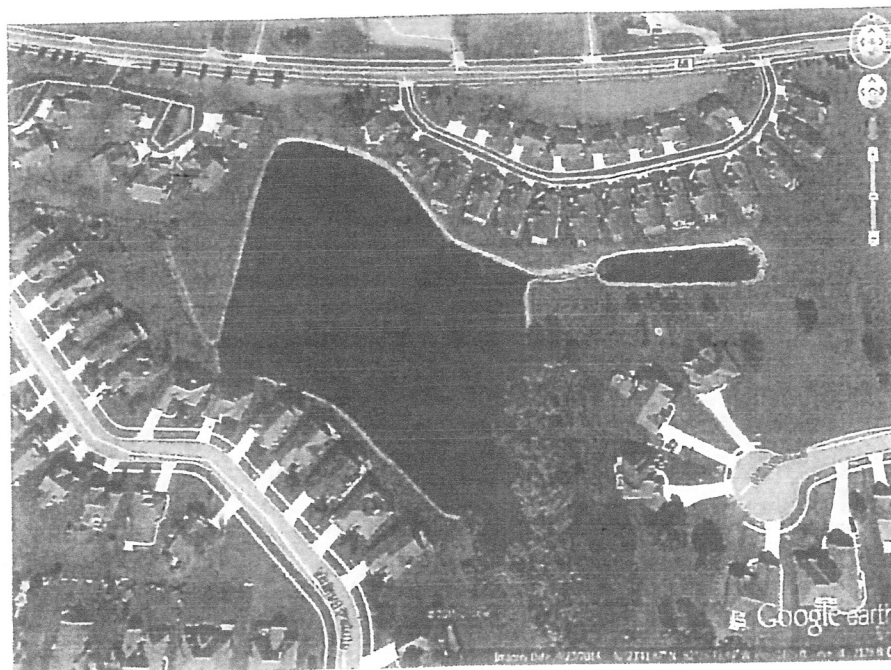
Knox Cattle Company Dam

File Number: 0323-003

Class I

Knox County, Monroe Township

Inspection Date: November 18, 2015



In accordance with Ohio Revised Code Section 1521.062, the owners of dams must monitor, maintain, and operate their dams safely. Negligence of owners in fulfilling these responsibilities can lead to the development of extremely hazardous conditions to downstream residents and properties. In the event of a dam failure, owners can be subject to liability claims.

The Chief of the Division of Water Resources has the responsibility to ensure that human life, health, and property are protected from the failure of dams. Conducting periodic safety inspections and working with dam owners to maintain and improve the overall condition of Ohio dams are vital aspects of achieving this purpose.

Representatives of the Chief conducted this inspection to evaluate the condition of the dam and its appurtenances under authority of Ohio Revised Code Section 1521.062. In accordance with Ohio Administrative Code Rule 1501:21-21-03, the owners of dams must implement all remedial measures listed in the enclosed report.

History of Knox Cattle Company Dam

Date	Event
1945	Dam constructed.
1992	Dam safety inspection by the Division of Water Resources.
?	Dam and adjacent property sold and developed.
2008	Division of Water Resources visited the site and reclassified the dam from Class II to class I based on downstream development.
2009	Division of Water Resources informed the new owners of the required remediation.
November 24, 2010	Dam safety inspection by the Division of Water Resources.
November 18, 2015	Dam safety inspection by the Division of Water Resources.s.

Dam Classification Checklist

Name of Dam: Knox Cattle Company Dam File Number: 0323-003
 County: Knox Date: November 18, 2015 Engineer: TMG

The classification of a dam is based on three factors: the dam's height, storage capacity, and potential downstream hazard. The height of the dam is the vertical distance from the crest to the downstream toe. The storage capacity is the volume of water that the dam can impound at the top of dam (crest) elevation. The downstream hazard consists of roads, buildings, homes, and other structures that would be damaged in the event of a dam failure. Potential for loss of life is also evaluated. Various dam failure scenarios must be considered, and they include failures when the dam is at normal pool level and failures during significant flood events. Each of the three factors is evaluated, and the final classification of the dam is based on the highest individual factor. Class I is the highest and Class IV is the lowest. The classification of a dam can change based on future development along the downstream channel.

This checklist is intended to establish or verify the appropriate classification in accordance with the Ohio Administrative Code -- it does not necessarily show all potential hazards or the full extent of inundation. In addition, elevations are estimated.

HEIGHT CLASSIFICATION

Dam Height = 19.80 feet
 > 60' - Class I
 > 40' - Class II
 > 25' - Class III
 X ≤ 25' - Class IV

STORAGE CLASSIFICATION

Stor. Capacity (top of dam) = 30.20 acre-feet
 > 5000 acre-feet - Class I
 > 500 acre-feet - Class II
 > 50 acre-feet - Class III
 X ≤ 50 acre-feet - Class IV

EXEMPT-NON-REGULATED

 Height ≤ 6 feet
 Storage ≤ 15 acre-feet
 6 ft. < Height < 10 ft. &
 Stor. ≤ 50 ac-ft

Height Class:

IV

Storage Class:

IV

Hazard Class (see next page):

I

Estimated Population at Risk: 6-15

Final Class:

I

Class Changed (Yes, No)

Flood Routing Summary

A dam must be able to safely pass severe flood events. A dam uses a combination of reservoir storage capacity and spillway discharge to prevent floodwater from overtopping the embankment crest. As part of this inspection, the Division of Water Resources did not thoroughly investigate the ability of this dam to safely pass the required design flood. In 2011 the Division of Water Resources performed hydrologic and hydraulic calculations to estimate the size of the design flood and the total spillway discharge capacity of the dam. These calculations combined with the reservoir storage capacity were used in the flood routings to determine the maximum water surface elevation in the reservoir for various flood events (see Table I).

Knox Cattle Company Dam is a Class I dam; therefore, in accordance with OAC Rule 1501:21-13-02, the required design flood is 100% of the Probable Maximum Flood (PMF) or the critical flood. This dam and its spillway system must safely pass the design flood without overtopping the embankment crest. Flood routing calculations indicate that the dam can pass 12% of the PMF; Knox Cattle Company Dam does not appear to be able to safely pass the design flood.

Table I - Flood Routing Summary

Flood Event	Maximum Inflow	Maximum WSEL ¹	Overtopping	
			Depth ²	Duration
	(cubic feet per second)	(feet)	(feet)	(hours)
PMF	2145	1114.35	1.45	4.5
75% PMF	1608	1114.08	1.18	4.5
50% PMF	1072	1113.77	0.87	4.1
25% PMF	536	1113.38	0.48	1.7
12% PMF ³	257	1112.78	-0.12	0

1. WSEL – water surface elevation, in feet above the mean sea level

2. A negative number indicates that the dam does not overtop and represents the elevation difference between the Maximum WSEL and the Top of Dam Elevation (freeboard)

3. 12% PMF is similar to the 100-year flood. The 100-year flood event has a 1% chance of occurring in any given year. This is only an approximation.

Top of Dam Elevation: 1112.90 feet above msl

Emergency Spillway Elevation: 1110.10 feet above msl

Normal Pool Elevation: 1110.00 feet above msl

CLASS 1



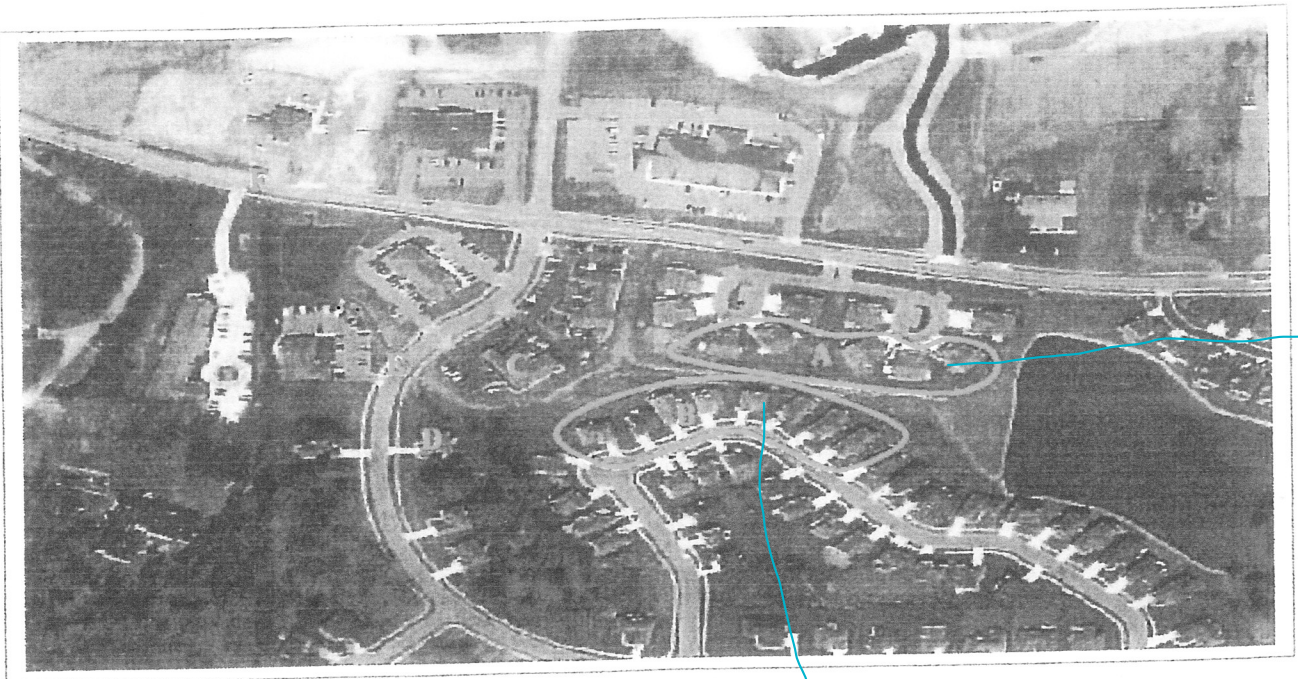
POTENTIAL DOWNSTREAM HAZARD

	I	II	III	IV	V	VI	Distance downstream of dam to affected structure (feet)	Vertical distance from streambed to base of affected structure (feet)	Horizontal distance from stream to affected structure (feet)	
Probable loss of human life										
Loss of public water supply or wastewater treatment facility, release of health hazardous waste										
Flooding of structure or high-value property										
Damage to high-value or Class I, II, III dam or levee										
Damage to major road (US or state route), disruption of only access to residential or critical facility area										
Damage to railroad or public utility										
Damage to rural building, not otherwise high-valued property, or Class IV dam or levee										
Damage to local road (county and township)										
Loss restricted mainly to the dam or agricultural /rural land										
No hazard to structure noted										
No hazard assessment; further investigation needed										
							25	6-10	25	Homes
							250	4-6	25	Homes
							600	9	50	Business
							800	6	100	Home
							925	11	0	Woodlake Tr
							1350	7	0	Yauger Dr

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1. This checklist is intended to establish or verify the appropriate classification in accordance with the OAC – it does not necessarily show all potential hazards or the full extent of inundation.
2. The letters in the above chart correspond to matching letters on the following maps.
3. In the event of dam failure, downstream property owners or other affected parties in addition to those identified in the table above should be made aware of the situation.
4. This downstream hazard investigation is based on field observations and from 2014 aerial imagery obtained from Google Earth.

Location of Developments Downstream of Dam



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