

Sand Lake Inlet/Outlet

MDNR ID #02269

Hazard Potential: Low

Lenawee County, Michigan
Cambridge Township Sec. 12, 13 (T5S, R2E)
Franklin Township Sec. 7, 18 (T5S, R2E)

Inspection conducted June 18, 2015
Act 451 P.A. of 1994 Part 307

Owner of Lake Level
Lenawee County

Represented by: Jennifer L. Escott
Lenawee County Drain Commissioner
320 Springbrook Ave., Adrian Michigan 49221

Inspectors:

Joseph P. Brezvai
Lenawee County Drain Commission
Brian J. Cenci, P.E.
Eng., Inc.

Professional Engineer:
Brian J. Cenci, P.E.



[Handwritten Signature]
10-18-15

SAND LAKE INTRODUCTION

During the years of 1931 and 1932, the three hundred residents of Sand Lake observed an abnormal drop in the lake level of approximately six feet. It is documented that the lake "moved" roughly 1,000 feet further from the houses. The overwhelming concern for this condition prompted action by the Sand Lake Association. Andrew J. Sawyer was appointed the committee chairman; he was determined to restore the lake to its normal level.

Mr. Sawyer contacted his Congressman, Earl C. Michener, who referred the case to the U.S. Department of the Interior Geological Survey. Apparently the association felt that a newly constructed well on the Keeney property allowed the lake water to escape. Mr. R. A. Smith of the Department of the Interior (DIT) explained that this was not possible; the decrease was natural rather than artificial.

W. Osgood(DIT) explained:

High water level in Sand Lake from 1920 to 1925 apparently resulted from more than normal rainfall from 1916 to 1921. The falling level from 1925 to 1927 followed rainfall deficiency in 1922 to 1924. High water in 1930 reflects the excess rainfall in 1925, 1926, and 1927. The present extremely low water level is the natural result of the greatest shortage of rainfall during the period of 1928 to 1931 of any period since 1895. On the basis of the above facts, it is safe to predict that increased precipitation will result in a rising lake level within a relatively short period.

This explanation, coupled with the fact that the volume of water Mr. Keeney used from the well would have only dropped the lake level approximately one inch, proved the cause was natural.

The association then followed the normal legal process to establish a lake level. After much debate, the legal level was set at 969.46 feet above sea level by the Honorable G. Arthur Rathbun in the Lenawee County Courthouse on March 4, 1940.

Establishing a lake level for Sand Lake helped "cap" the high flows but it did nothing for low flow periods. Dry summers often caused a drastic drop in the level within three years. In order to compensate for this, the Sand Lake Association needed to find an artificial source of water to maintain the water table. During the 1950's, a few wells were added. As the water level dropped, the wells could be manually operated to help fill the lake and restore its level.

CONTROL STRUCTURE

The device installed in 1940 used to control the level of Sand Lake is an open-face weir, placed at the north end of an 800' long 30" culvert. A channel was constructed on the NW corner of Sand Lake to bring water to the south end of the control structure. This channel is approximately 1,000' long and its depth and width varies.

Originally, I believe the 30" culvert installed was intended to be used as an equalizer pipe to provide water to Sand Lake during dry conditions and to drain water during wet conditions. Back in the 1930's, prior to construction, a survey indicated the elevation of the swamp North of US-12 was

roughly three feet above the level of Sand Lake. At this time, the lake was abnormally low. In order to fill the lake to a more acceptable level, the 800' long culvert was installed. This drained water from Iron and Wamplers Lakes through a wetland/swamp area into Sand Lake. After the water level of Sand Lake was brought up, the weir was installed to control the level of Sand Lake.

In 1999 McNamee Porter, & Seeley, Inc., (MPS) conducted a study for the Lenawee County Drain Commissioner of Sand Lake and the lake level control structure. The study consisted of evaluating the 50 and 100 year flood elevations, preparation of drawing indicating structures and elevations, and recommendations for cleaning and inspecting the 30" culvert. The study identified that the existing weir in place was not at the legal court ordered level, and MPS recommended amending the legal level of Sand Lake to the existing weir elevation of 968.51. The change in the lake level would not change the physical level of lake but would provide the Lenawee County Drain Commission the ability to maintain it at a level to prevent the flooding of property if it were raised to the level of 969.46 as ordered by Circuit Court on March 4, 1990. The study also recommended cleaning and televising the 30" culvert to identify the location and condition of the culvert.

In February of 2000 the Lenawee County Board of Commissioners passed a resolution directing the Lenawee County Prosecuting Attorney to initiate a petition to Circuit Court to establish an assessment district for Sand Lake to incur costs to be associated with maintaining and further investigation of the lake level by the Lenawee County Drain Commissioner. The Office of the Lenawee County Prosecuting Attorney thence proceeded with a petition according to the Inland Lake Level Act, MCLA Section 324.30701 et seq:. On April 2, 2002 Circuit Court by order amended the legal lake level to 968.51 from 969.46. On June 4, 2002 Circuit Court confirmed the special assessment district for Sand Lake.

A cleaning and inspection was performed in September 2002 by the SOS Service Group of Brighton, MI. The inspection consisted of televising the culvert for its internal condition. Several areas of concern were found with the condition of the culvert. The culvert was slipped lined in December 2002 by the SOS Service Group. The project involved adding an additional manhole structure for future maintenance cleaning and inspection.

In 2007 an Agri-Drain water control structure was installed to replace the existing weir and wing walls on the north side of US-12. The wing walls and weir and were in deteriorating condition from age and were in need of replacement.

RECOMMENDATIONS AND CONCLUSIONS

See attached Report.

It should be noted that the amount of money available to spend on a lake level is limited to \$10,000.00 per year. In order for the Drain Commissioner to exceed this limit, an emergency condition or a petition by the district is necessary.



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
LAND AND WATER MANAGEMENT DIVISION
DAM INSPECTION REPORT**

This form is to be used for inspection reports required by Part 307, Inland Lake Levels, for those dams that do not meet the size criteria as defined by Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Dams six (6) feet or more in height, as defined by Part 315, and impounding five (5) acres or more at the design flood elevation, must meet the inspection report format as outlined in Section 31518 of Part 315.

A person failing to comply, or falsely representing dam conditions, is guilty of misconduct in office.

DAM NAME Sand Lake Inlet/Outlet		DAM ID 02269	COUNTY Lenawee
DATE OF INSPECTION June 18, 2015	NAME OF WATERBODY Sand Lake	SECTION, TOWN, RANGE Sec. 12 T 5-S, R 2-E	LEVEL THIS DATE 968.25 South Side 968.18 North Side
DATE ELEVATION SET BY COURT 4-2-2002	LEGAL LEVEL 968.51	DRAWDOWN LEVEL Not Applicable	HIGH WATER MARK ELEVATION 968.84

EARTH EMBANKMENTS LEFT EMBANKMENT __NA__ FT. RIGHT EMBANKMENT __NA__ FT. TOTAL LENGTH __NA__ FT.
(LOOKING DOWNSTREAM)

	UPSTREAM	CROWN	DOWNSTREAM
VEGETATIVE COVER	N/A	N/A	N/A
EROSION	None	None	None
SEEPAGE			None
SLIDES, SLUMPS & CRACKS	N/A	N/A	N/A
ANIMAL BURROWS	None	None	None
WAVE ACTION PROTECTION	N/A		N/A
REMARKS*	None	None	None

CONTROL STRUCTURE

TYPE 800 feet of 22 inch HDPE & Agri-Drain Water Control Structure.	YEAR CONSTRUCTED 1959 Original 30 inch CMP replaced in 2002. Agri-Drain structure installed in 2007	STRUCTURAL HEIGHT (top of dam elevation minus stream invert) 3.2 feet
LENGTH OF SPILLWAY 15 feet	FREEBOARD 2.0 feet	HYDRAULIC HEIGHT (design flood elevation minus stream invert) 1.83 feet
VERTICAL PIPE SIZE Not applicable.	HORIZONTAL PIPE SIZE 800 feet of 22 inch HDPE	HEAD (normal headwater minus normal tailwater) .9 feet

DESCRIBE CONDITION OF THE FOLLOWING ITEMS.

STOPLOG VALVES AND GATES (open and close to check condition): Check location of top stoplog in relation to top of riser pipe intake box or fixed crest, for leakage, and condition of stoplogs, valves and gates.
Stop logs are metal at the outlet structure and are in good condition. WSEL 0.3 feet above reference mark above crown of pipe.

CONTROL STRUCTURE (continued)

OUTLET PIPE: Check for damage from ice, logs, vandalism; inside discharge pipe for settlement and/or joint separation; condition of pipe coating. New 21" HDPE installed in 2002. Overall in good condition. Some minor debris on south end at inlet side.	
CONCRETE STRUCTURE: Check for erosion; location of cracking or spalling. If old or new; settlement; need for crack repairs. Concrete headwall on south end (inlet) is in fair condition. No visible signs of cracks or settlement of structure.	
WALKWAY & RAILING: Check if in place or removed, condition, and if adequate protection provided. None	TRASHRACK OR LOG BOOM: Check if operable. N/A
EMERGENCY SPILLWAY: Size, type, and condition. N/A, none exists	

INLET & OUTLET CHANNELS

	INLET	OUTLET
SIZE	Open channel from sand lake. 30+ feet wide, 1000-foot long	Small swale (2-3 feet wide) through wetland area
EXISTING CONDITION	Fair, some debris collects near inlet, should be monitored	Good
EROSION	None	None
DEBRIS & OBSTRUCTIONS	Tire, metal grate near....nothing blocking flow	None
RIPRAP PROTECTION	None, headwall in place so nothing needed	None
REMARKS*	Overall in fair condition	Overall in good condition

RECOMMENDATIONS

List work needed, how to be done, by whom, estimated cost, source of funds, recommended completion date. If emergency, to what extent. ADDITIONAL COMMENTS.

Inspection Ordered By: Jennifer L. Escott, Lenawee County Drain Commissioner
Lenawee County Delegated Agent

Brian J. Cenci, P.E.

4063 Grand Oak Drive, Suite A109

INSPECTOR'S NAME (PRINTED)

ADDRESS

SIGNATURE

Lansing, MI 48911

No. 6201053847

CITY, STATE, ZIP CODE

517-887-1100

P.E. REGISTRATION NO.

TELEPHONE NUMBER

Please submit this completed report and photographs of the dam, downstream channel, and deficiencies cited in the report to:

DAM SAFETY PROGRAM
LAND AND WATER MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
PO BOX 30458
LANSING MI 48909-7958

*NOTE: If space is inadequate for remarks, attach additional sheets as needed.

SAND LAKE LEVEL CONTROL STRUCTURE



North Side US-12 Control Structure



South Side of US-12 Structure



South Side of US-12 Looking Upstream



Inside Control Structure