STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF GENESEE

In the matter of the Establishment of the Level of Ponemah, Tupper and Squaw Lakes located in Fenton Township, Genesee County, Michigan

NO. 986

FINAL ORDER OF DETERMINATION OF LEVEL OF PONEMAH, TUPPER AND SQUAW LAKES

At a session of said Court held in the Court House in the City of Flint, in said County, on the 4th day of September, 1963
PRESENT: HON. Stewart A. Newblatt, Circuit Judge

It appearing to this Court from the evidence presented by the Department, Genesee County Drain Commissioner, and after hearing all interested persons appearing in Court that the mean and high levels of Ponemah, Tupper and Squaw Lakes should be established, and that the statute governing the same has been complied with:

NOW THEREFORE in pursuance of the provisions of Act No. 276 of Public Acts of 1945, I do hereby fix the mean level of Ponemah, Tupper and Squaw Lakes at 869 feet above sea level and the high level at 870 feet above sea level.

The Department, Genesee County Drain Commissioner, is ordered to set a permanent monument commemorating the establishment of these levels in some suitable place in proximity to said lakes within one year from the date hereof and a copy hereof shall be forthwith recorded in the Office of the Register of Deeds of Genesee County, Michigan, the County affected.

STEWART A. NEWBLATT

Circuit Judge

Countersigned:

Margery Newman
Deputy Clerk

RECORDED
Earl M. Smith
REGISTER OF DEEDS

SEP 10 8 57 AM '63

GENESEE COUNTY
FLINT, MICHIGAN

McTaggart & Lattie
William R. McTaggart
702 Church Street
Flint 3, Michigan

State of Michigan
County of Genesee ss

I, George G. Dunn, Clerk of the Circuit Court for the County of Genesee, and State of Michigan, do hereby certify that the above and foregoing is a true and correct copy of an Order entered September 4, 1963 in the above entitled cause in said Court, as appears of record in my office; that I have compared the same with the original, and it is a true transcript therefrom, and of the whole thereof.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the Seal of said Court at the City of Flint,

Fenton Independent
Sept. 12, 1963
County Court sets PST water levels

Judge Sets Water Level

Preliminary to construction of a new dam on the Shiawassee river at Linden, Judge Stewart A. Newblatt in Flint Circuit Court last week established water levels for Lakes Pontomah, Squaw and Tupper Lake. He fixed the levels at 869 feet mean and 870 feet high over sea level.

The decision followed a court hearing. A petition had been filed in 1959 by residents of the lakes areas with the county drain commission asking a water level determination. A special assessment district, which includes 473 parcels of land around the lakes as well as in the village of Linden, has been set up.

Involved in the project is construction of a new dam at the site of the present Linden dam. A bridge over Ripley road and dredging of the Shiawassee river from Tupper Lake to the dam site is included. Estimated cost of the project is $100,000.

Construction is to begin early in 1964, Drain Commissioner Anthony Ragnone indicated.

On May 28 the same water levels approved by the judge had been set by Ragnone, based on a study of the lakes made by an Ann Arbor engineering firm. These levels had been challenged by some residents of the areas, and the hearing followed.

Austin Gilbert, 14037 Squaw Lake drive, chairman of a committee which petitioned for the drainage district, said there had been problems because of extremes of high and low water. He called it "an intolerable situation."

...ARD
...WARD
...SMIT
...CRAIGMILE

...E. AYRES
ROBERT NORRIS

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
500 WOLVERINE BUILDING
ANN ARBOR, MICHIGAN 48108
313-761-1010

HYDRAULIC PROBLEMS
WATER SUPPLY
SEWAGE DISPOSAL
ELECTRIC POWER

SURVEYS, REPORTS
DESIGNS, APPRAISALS
SUPERVISION OF
CONSTRUCTION

March 10, 1967

Genesee County Drain Commissioner
Room 203 County Office Building
Flint, Michigan

Re: Linden Dam

Dear Mr. Ragnone

In reply to your inquiry relative to operation of the proposed Linden Dam, we submit the following:

On Spetember 4, 1963, Circuit Court for the County of Genesee fixed the mean level of Ponemah, Tupper, and Squaw Lakes at 869 feet above sea level and high level at 870 feet above sea level.

Economic and engineering factors dictated the need for a control structure using a radial gate device in lieu of more expensive type construction employing drum, bear-trap, or tilting gates.

Accordingly, a radial gate type of structure has been used with crest elevation established at 869 feet above sea level.

Also contained within the structure for minute control of stream flows is a 48-inch sluiceway with bar rack and sluice gate control independent of the radial gate.

With full closure of the 48-inch sluice gate, stream flow would of necessity be over the crest of the radial gate. As long as stream flows are minimum and do not create excessive lake levels upstream, operation of the sluice gate in such fashion to afford crest overflow of the radial gate could be tolerated. However, winter flows over the crest would produce detrimental icing effects and would also nulify storage provisions for expected high flow spring run-off. Subsequently a lowering of pond level to elevation 868 during the winter months is essential.

In repitition, please note that construction of the control structure by itself may alleviate flood conditions on the upstream lakes, but, only through construction of upstream corrective channel work, as tentatively postponed, can elimination of major flooding be achieved.

Very truly yours,

AYRES, LEWIS, NORRIS & MAY

By J. D. Craigmile

JDC:pr

Lake Level Advisory Comm.

PART 1 OF 3

By Ted D. Goupil 1974

This the first of a series of articles written to acquaint residents with the operation of the Linden Dam and the parties charged with the responsibilities of dam operation. The first article deals with the Advisory Committee.

The Lake Level Advisory Committee (sometimes known as Linden Dam Committee) was formed several years ago by Anthony Ragnone, Genesee County Drain Commissioner to enable him to receive input from local residents affected by the Linden Dam. Even though the Drain Commissioner has ultimate responsibility for dam operation, with the Commissioner's many other duties he is unable to personally oversee the project and has delegated the job to Mr. Stanley Butynski, an engineer in the Drain Office. Mr. Butynski is the Drain Office's representative on the Lake Level Advisory Committee.

→ now Jim Gerth Tom Dorso

The other members of the committee are representatives of the Village of Linden, Fenton Township, and Squaw and Ponemah Lakes. Mr. Charles Rodgers from Linden, Mr. Ted Goupil from the Fenton Township Board, and Mr. Rudy Carlson from Squawnemah Property Owners Association make up the rest of the committee. Goupil was chosen Chairman of the committee and Rodgers secretary.

The committee meets monthly (first Monday of each month) in the Fenton Township Hall. It is the function of this group to meet and discuss any problems which relate to the operation of the dam. This includes the mechanical aspects of the dam, how to maintain an adequate mill pond level, how to maintain legal lake levels upstream, and how to improve flow of water in the Shiawassee River which connects Squaw, Ponemah and Tupper Lakes with the mill pond.

The next article in this series will deal with the operation of Linden Dam.

1974

PART 2 OF 3

Function Of the Linden Dam

By Ted D. Goupil

This is the second of a series of articles to acquaint residents with the operation of the Linden Dam and the parties charged with the responsibilities of dam operation. This article deals with the specific operation of the dam itself.

The Lake Level Advisory Committee, an advisory group formed to advise Mr. Anthony Ragnone, Genesee County Drain Commissioner on lake levels and dam control, is made up of Mr. Charles Rodgers from Linden, Mr. Ted Goupil from Fenton Township Board, and Mr. Rudy Carlson from Squaw-nemah Property Owners Association, and Mr. Stanley Butynski from the Drain Office.

The Linden Dam's function is much the same as any other dam, to restrict the flow of water for one reason or another. While some dams restrict water for the purpose of supplying power for some operation such as a mill or power plant, this dam restricts water for the purpose of maintaining a certain amount of water for upstream use. Specifically, three lakes, Ponemah, Squaw and Tupper plus the Linden Millpond are basins for the water. The Shiawassee River is the connecting waterway between these bodies of water. Whatever is done to alter the level of water at the dam has a direct effect on the levels of water in these lakes and millpond. In order to maintain adequate levels it is crucial that the dam be operated properly.

There are three ways in which water can pass the dam. It can pass under the large gate called a tainer gate. It can pass through a bypass tube which goes around the gate. Or the water can go over the top of the gate.

It is the responsibility of the dam operator (who is hired by the Genesee County Drain Office) to see that enough water is held back or released through the dam to maintain the proper level on the millpond and the upstream lakes. At times you may see water rushing through under the big gate. This means that the gate has been raised to allow large volumes of water to pass. At times you may see no water going under the gate, but you may see water bubbling up from the concrete wall below the dam. This water is passing through the bypass tube. At other times you may see water going over the top of the gate. This usually means that the gate is closed and the tube is virtually closed.

The dam operator may use any or all of these three methods of releasing water. But principally he will open and close the tube and the tainer gate to release the desired amount. In order to determine where to set these he must obtain information from staff guages. One such gauge is located right on the dam, calibrated in tenths of a foot (5.0, 4.9, 4.8, etc.). This gauge tells him the level of the millpond, 5.0 represents a full millpond. Another gauge is located on a bridge where the Shiawassee River flows under North Road in Fenton Township. The third gauge is located on a seawall in Lake Ponemah. With readings from these three gauges he can tell the level of the millpond, the level of the Shiawassee River as it enters the lakes and the level of the lakes themselves.

The next article in this series will deal with how the dam controls levels on the millpond and upstream lakes, and the problems of river flow.

1974

1974

1974

Genesee County Drain Commission - Surface Water Management

www.gcdcswm.com

PART 3 OF 3

Controlling Millpond and Lake Levels

by Ted D. Goupil 1974

This is the third of a series of articles written to acquaint residents with the operation of the Linden Dam and the parties charged with the responsibilities of dam operation.

The Lake Level Advisory Committee made up of Mr. Rudy Carlson, of Squawnemah Property Owners Assoc., Mr. Charles Rodgers from Linden, Mr. Stanley Butynski from the Drain Office, and Mr. Ted Goupil representing the Fenton Township Board, advise the Genesee County Drain Commissioner on matters concerning the operation of the Linden Dam. Of particular importance in dam operation is the effect of dam operation on the levels of the millpond and the upstream lakes; Ponemah, Squaw and Tupper, as well as the Shiawassee River itself.

High-summer 870' above sea level
Mean-winter 869' above sea level

A Genesee County Circuit Court has established a legal level for the lakes above the dam. In order to maintain this level of water the operation of the dam is crucial. In addition to maintaining the Court-ordered levels on the lakes the dam also determines how much water is in the millpond. It has been a difficult problem in recent years to satisfy the legal level of the lakes while keeping adequate water in the millpond.

The Lake Level Advisory Committee has studied this problem intently and discovered that when a high water condition exists on the lakes and the dam was opened to lower the lakes it was taking up to 24 hours for the lakes to start dropping. Meanwhile, the lakes were receiving more water from drainage of surrounding areas. Investigation of the Shiawassee River revealed there were several obstructions in the river between the Millpond and the upstream lakes which restricted the flow.

Township residents, Tony Lenzi, Rudy Carlson, Tony Bates and others, helped remove the trees and brush that were hindering flow. But, the major obstructions appeared under the Grand Trunk Railroad Bidge and at the Ripley Road Bridge. Through the efforts of this Committee, the Drain Office & Supervisor Jim Smeets, the Grand Trunk Railroad brought a railway crane in May 1974 and removed the rocks under the bridge.

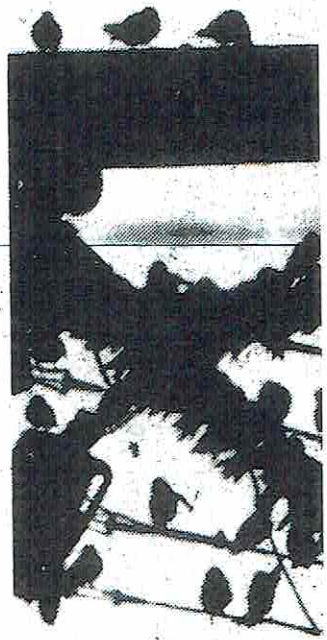
This has improved the flow somewhat and it is hoped that the Ripley Road Bridge obstructions can be removed soon.

The Drain Office has established a policy of trying to keep the millpond at a summer level equivalent to the height of the top of the metal gate on the dam. When water reaches the top of the gate, water is released through a bypass tube beside the dam to keep this level constant. In the winter the level of the Millpond is set at one-foot below the summer level.

A major problem which continually plagues this committee and the dam operator is trying to maintain proper levels on both the lakes and the millpond. It is virtually impossible to maintain a constant millpond level while trying to maintain the Court-ordered levels on the lakes. Conversely, to keep the desired Millpond levels without variation will result in too high or too low levels on the lakes. Consequently you will see fluctuations in the millpond from time to time.

The Committee continues to work to improve conditions on these waters for your benefit.

Hearing slated to decide Linden mill pond level



By ED BACKUS
and ROGER WELSHANS
Journal Staff Writers

A hearing to determine the proper level for the Linden mill pond has been scheduled for 9 a.m. Nov. 12 by Genesee Circuit Judge Donald R. Freeman.

Freeman ordered the hearing after receiving a petition from Genesee County Prosecutor Robert F. Leonard. Leonard, acting through John G. David, special legal counsel, reported that Drain Com. Anthony Ragnone has tentatively determined that the normal level of the mill pond is 869 feet above sea level.

The Genesee County Board of Commissioners formally authorized on May 21 the prosecutor's action under the Inland Lake Level Act of 1961.

According to Linden officials, the level of the mill pond was supposed to be set years ago. Extensive flooding this spring of Lake Ponemah sparked several complaints about the level of the mill pond. That led to the circuit court hearing.

LAKE PONEMAH feeds the Linden mill pond through a narrow channel. When the lake flooded, residents thought the level of the mill pond was too high to allow proper drainage of the lake.

However, Fenton Twp. officials later discovered that the channel connecting Lake Ponemah with the mill pond was partially blocked. That blockage restricted water flow, increasing the flooding on Lake Ponemah.

Some of the blockage in the channel has been cleared. Also, the Fenton Twp. Board has authorized a study of the channel to see if other changes are needed.

Freeman ordered that the Michigan Department of Natural Resources, the village of Linden, Fenton Twp. and all property owners living in the area of the mill pond be notified of the hearing.

The Drain Commissioner's Office has established a special assessment district to defray costs involved in establishing the water level. Property owners in Linden and Fenton Twp. were included in the assessment area.

Harold Smith, deputy drain commissioner, said the costs are not expected to be great.

SMITH SAID the Village of Linden had initiated the hearing request early this year in an effort to prevent further flooding.

The drain office is required by law to regulate water levels on the three lakes that feed into the mill pond — Tupper, Squaw and Ponemah.

Dams exist at the lakes and mill pond for this purpose.

The Drain Office has determined, Smith said, that 869 feet above sea level is normal for the mill pond, with a permissable high level of 869.5 and a low of 868.

Smith said a long-range solution to flooding around the mill pond may require widening the channel leading to it.

It is expected that Linden officials and property owners will testify at the hearing about the need for setting a level for the mill pond.

Teacher pact

Petition denied due to precedent set by PSC legal lake level of 1963.

Dredging is not the answer, says Smeets

LETTER TO EDITOR:

I would like to share a few thoughts with you in response to the comments of Genesee County Drain Commissioner Anthony Ragnone. The only way we can avoid flooding conditions for Lake Ponemah residents is by adjusting the Linden Millpond gate as soon as possible after a heavy rain. Dredging the river and continuing to operate the millpond gate in the present method accomplishes nothing. If we don't open the gate in a timely manner, where will the water go? To demonstrate how this theory would work, I would like to reconstruct the latest near-crisis situation that happened Memorial Weekend this year:

Heavy rains early Friday evening (start of long holiday weekend).

Very heavy downpour Memorial Day (4 days later).

First adjustment to Linden Millpond gate-sometime Tuesday, 5 days after Friday's heavy rain.

No amount of improvement in the river channel will improve the flooding situation in our lakes if we do not react faster and open the millpond gate. Under the present arrangement, we are always in a "catch-up" situation and in their effort to alleviate the problems on the lakes, the people responsible for adjusting the gate, open it too much and lower the millpond much more than is necessary to help the lake residents. This is unfair to the Linden Millpond residents who have made shoreline improvements and installed docks. We have never asked the drain office representative to lower the millpond this much. If they could lower the millpond one foot, we would be getting maximum flow from the lakes.

Some millpond residents reported that their pond had been lowered as much as four to five feet following the Memorial Day rains. We then notified the drain office representative and he adjusted the gate and several hours later it was flowing over the top of the dam.

This yo-yo or see-saw effect is not fair to the Millpond residents and certainly doesn't help the lake residents.

The next question usually asked is why not improve the channel so that you can replace the water in the millpond as fast as it can be dumped? To this question I would only ask what would happen to downriver residents if we dumped water at maximum flow after waiting several days to open the dam.

The large build-up of water on our lakes would cause washout problems from Linden to Byron. I know that some of our residents have small private bridges across the river to access their homes. What would happen to them? I understand they had concerns when we attempted to regulate the lakes after Memorial Day.

Another more recent concern should be the new Gazebo that the Village has constructed at the foot of the dam. Even with present flow the island that the Gazebo sits on is under water. What would happen if the channel improvement is made to increase the flow and we wait several days to open the dam? Our theory is to get the same amount of water through the Linden Dam over a longer period of time by reacting sooner after a heavy rain.

In our opinion the only way to accomplish that is to remove the human element from the control of the dam. Here is how the proposal automatic gate control will work:

Water level sensing control will read water level in Shiawassee River at North Road. When river is rising during rain it will send signal via dedicated telephone lines to automatic gate control at Linden Millpond.

Automatic gate control will open dam gate and lower millpond to increase flow in the river and thereby lower lakes to prepare them for additional water.

When millpond has dropped one foot, low limit control will take over and reduce gate opening to maintain that level in millpond.

As long as there is increased flow in the Shiawassee River, the automatic control will continue to reduce the level in the lakes to prepare them for the large flow of water coming down the river. Since we have four to five day lag before this water crests in our lakes, we could have them lowered enough so that the increased volume would not cause flooding conditions for our residents.

Thanks very much for allowing me to share this proposal with you.

JAMES S. SMEETS
Fenton Township Supervisor

Info Regarding Lake Level

PONEMAH, SQUAW & TUPPER LAKE ASSOCIATION
Fenton, MI

CHARTER TOWNSHIP OF FENTON BOARD OF TRUSTEES MINUTES FOR REGULAR MEETING OF SEPTEMBER 4, 2007

Per the Genesee County Drain Commissioner Jeff Wright

Lake Ponemah Lake Level

Supervisor Mathis asked about the established lake level for Lake Ponemah. Many

residents have complained that the level is too low this year. Commissioner Wright

stated that his office controls the level of the Linden Mill Pond, which affects the level of

Lake Ponemah. The level of the Linden Mill Pond was established by the courts several

decades ago. They must work within the established guidelines, which may result in

fluctuating levels in Lake Ponemah. Other factors, such as rainfall and the flow in the

Shiawassee River, will also impact the lake level.

Send mail to pstcomments@hotmail.com with questions or comments about this web site.
Last modified: 02/01/11 10:21 AM -0500

P-S-T Lakes: Legal Water Levels as Decreed - 1963

Mean Level; 869 feet above sea level [winter normal]
High Level; 870 feet above sea level [summer normal]

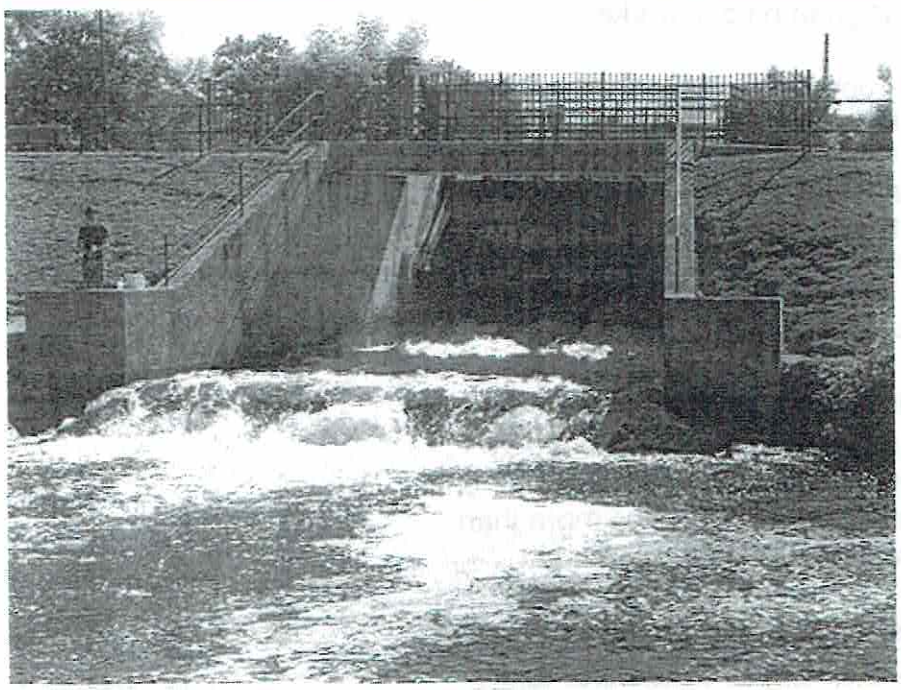
Shiawassee River -

Sunday, June 21, 2009

» » » Water Levels

Water Levels

Who controls area lake levels?



Lake water from several area lakes, including Squaw Lake and Lake Ponemah, flow through the Linden millpond and dam. The Genesee County Drain Commission monitors a digital system, which maintains a level between 868-870 feet above sea level for Squaw and Ponemah.

Mid-Shiawassee River Watershed - Hydrologic Study - 9/30/2010 - page 30

The Shiawassee River watershed is both a snowmelt-driven and a storm-driven system. In a storm-driven system, rainfalls during the growing season generate flood flows. Snowmelt-driven systems are usually less flashy than storm-driven systems, because the snow pack supplies a steadier rate of flow. ***However, a rain-on-snow event, where rain and snowmelt simultaneously contribute to runoff, can produce dramatic flow increases.*** The runoff from the rain and snowmelt also likely occur with saturated or frozen soil conditions, when the ground can absorb or store less water, resulting in more overland flow to surface waters than would occur otherwise. Although the Mid-Shiawassee River watershed is likely more of a snowmelt-driven system, the increasing imperviousness of urbanizing tributary watersheds may shift those watersheds toward more storm-driven systems.

Every 2 years, there is 50% chance, of getting a heavy thunderstorm dumping
2.42 inches of rain within a 24 hr period in the region.

If the weather man says we got 3 inches of rain in a 24 hr period, it's pretty significant news.
Back in August 2007, over 5 days, this area of Michigan received 5.12 inches of rain.-

An Example:
Rainfall Frequency Atlas of the Midwest, Bulletin 71, Midwestern Climate Center, 1992.

(south-eastern Michigan)

Rainfall frequencies, 24-hour duration (rainfall in inches)					
2-year	5-year	10-year	25-year	50-year	100-year
2.26	2.75	3.13	3.60	3.98	4.36

Dams & Lake Levels

DRAIN COMMISSIONER

Michigan has several hundred lakes with legally-established lake levels. On many of these lakes, the Drain Commissioner is responsible for maintaining the legal (normal) lake level. Legal Lake levels in Michigan are established under provisions of Part 307, Inland Lake levels, of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended (MCL 324.30701 – 324.30722).

The Drain Commissioner is usually designated as the delegated authority required to perform the duties required under the Act, which includes the operation and maintenance of water control structures for maintaining a Court ordered lake level.

Normal level is defined in Section 324.30701(h) of the Act and means:

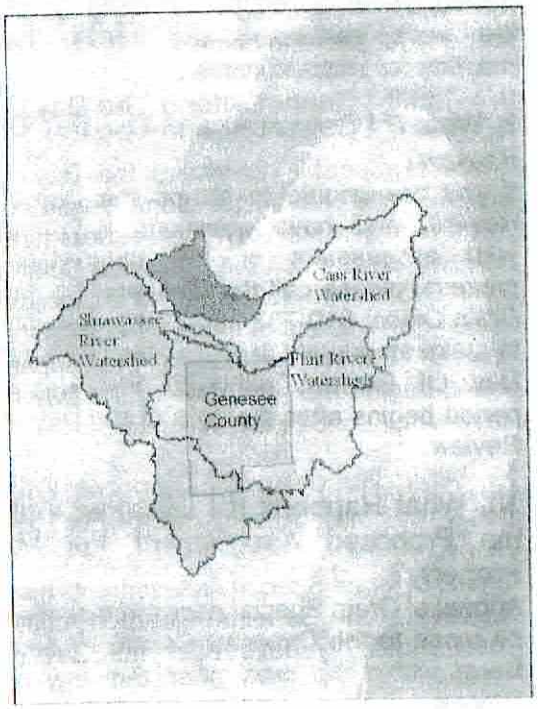
The level or levels of the water of an inland lake that provides the most benefit to the public; that best protect the public health, safety, and welfare; that best preserve the natural resources of the state; and that best preserve and protect the value of property around the lake. A normal level shall be measured and described as an elevation based on national geodetic vertical datum.

Under the Act, special assessments may be levied against privately-owned parcels, political subdivisions of the State, and State-owned lands under the control of the Michigan Department of Natural Resources (MDNR). Special assessment districts include those properties that directly benefit from the establishment and maintenance of a normal lake level. In most cases, it will include all properties abutting the lake and backlot properties with deeded or dedicated lake access.

Water Facts

Much of Genesee County's surface water drains through stormdrains (road catch basins, underground pipes and open ditches), which empty into Creeks, Streams and Rivers. A watershed is any area of land that drains to a common point. That common point can be a lake, a river or an arbitrary point within the river system.

Within Genesee County, the rain that falls either ends up in the Flint River, Shiawassee River or the Cass River. These rivers flow out of Genesee County and eventually come together along with the Tittabawassee to become the Saginaw River before flowing into the Great Lakes; specifically Lake Huron.



Dear Genesee County Property Owner,

This brochure offers a basic explanation of the Drain Special Assessment process that pays for maintaining the storm drain systems in Genesee County under my jurisdiction.

A properly maintained drainage system is important to county residents and businesses for everything from crop production to keeping streets passable and minimizing flood damage. A routinely maintained system is more cost effective, avoiding the need for large, expensive drain projects often required to rebuild a system that has been neglected for years.

The Drain Special Assessment process begins with the Day of Review of Appointments in which you as a property owner are invited to review the records of maintenance efforts and costs for providing your land with storm drainage, and to discuss your proposed share of those costs. This Day of Review also provides the opportunity for you to inform my staff and I of additional maintenance issues, helping us do a better job for you in the future.

If, after reading this brochure, you still have questions about Drain Special Assessments, please do not hesitate to contact my staff or me. The Genesee County Drain Office hours are 8:00 am to 5:00 pm, Monday through Friday.

Sincerely,

Jeffrey Wright,
Genesee County Drain Commissioner

Jim Gerth, Dam Operator
j.gerth@co.genesee.mi.us

Ten Frequently Asked Questions About Drain Special Assessments

GENESEE COUNTY
SWM
DRAIN COMMISSIONER

Jeffrey Wright
Genesee County Drain Commissioner
Division of Surface Water Management

4608 Beecher Road
Flint MI 48532
Phone 810-732-1590
Fax 810-732-1474
www.gcdcswm.com

EGLE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Identifying the Ordinary High Water Mark on Inland Lakes and Streams

Contact: Bethany Matousek 517-243-6421

Part 301: OHWM for inland lakes is the line between upland and bottomland identified by the presence of a distinct change in character of the land caused by successive changes in water levels. This line is identified in the field based on observed physical characteristics and may be reported by referencing either land survey elevation information or a relative benchmark such as observed water level or the base of a tree. A surveyed elevation is typically referenced to the National Geodetic Vertical Datum (NGVD 29 or NAVD 88). If the actual land elevation is not known (i.e., no land survey is done), then use a relative reference elevation such as 0 for an observed water level or a static benchmark. The OHWM elevation to report on the JPA will be the vertical distance from that benchmark to the physical line observed in the field. If using a water level as the benchmark, report the date of observation. The OHWM is used for calculating impacts from the proposed activities so the actual surveyed elevation itself is not necessary in many cases. The necessary information is where the OHWM lies vertically and horizontally in relation to the existing and proposed features on site (e.g., water levels, bottom of stream, dock dimensions, etc.). See EGLE's YouTube Series for OHWM video tutorials, and the sample OHWM drawings for more information. Some inland lakes have a legally established OHWM elevation (Legal Lake Level). For information, see EGLE's YouTube video describing Legal Lake Levels. Contact your County Drain Commissioner for established Legal Lake Levels in your area.

[EXHIBIT – A: Engineer Determination]

FEASIBILITY OF LOWER LAKE LEVEL IN WINTER MONTHS

The current summer level of ____ appears to be adequate and acceptable; however, setting a lower winter low lake level would have some of the more common advantages and/or disadvantages of having summer and winter lake levels as follows:

Advantages

I. Provide for stabilized water levels to protect property values and the lake environment.

II. Maximize recreational benefits.

III. Provide for a winter drawdown level to
   A. Minimize shoreline ice damage.
   B. Minimize erosion damage during periods of high water in the fall and spring.
   C. Minimize flooding by providing a cushion against high water, particularly in the spring.
   D. Control of some aquatic weeds.

IV. Maximize fisheries, wildlife and aesthetic values.

V. Place responsibility of maintaining the desired lake level(s) in the hands of the County Drain Commissioner, or other authority designated by the County Board.

VI. Provide a means whereby all benefited property owners and political subdivisions share in the cost of maintaining the necessary lake level control facilities.

VII. Liabilities for accidents at the control structure may be insured by the County at a lower cost.

VIII. The cost of repairs and maintenance at the control structure may be spread over a period of years and is tax deductible for Federal returns, if the tax payer itemizes.

Why is my lake water lowered in the winter?

Beth Clawson, Michigan State University Extension - December 30, 2016

Water drawdown is one tool that can be used to manage aquatic weed problems. Lake level drawdowns often start in the fall and continue through the winter when water recreation uses are at their lowest.

Some riparian owners hate seasonal drawdowns on lake or reservoir because it restricts recreation access and can look unsightly for a time. However, there are several reasons for this practice. The practice of water level lowering is not new and had historically been done to control increased rain and winter snow melt runoff from late fall through early spring. This also helped to reduce shoreline erosion during these heavy flooding periods.

Other reasons besides shoreline protection include:

- Aquatic weed control. Most aquatic weeds are found near the shallow shoreline. Drawdowns during the winter can dry and freeze the offending plants helping to control invasive species.
- Reduce ice damage to shorelines from ice push during the winter.
- Water storage level and flow regulation
- Shoreline access for clean-up and sediment removal
- Allows access to docks, seawalls and other installations for inspection and repair

There are some detrimental impact that a drawdown can have as well, including:

- May not kill the desired invasive plant
- Exposed sediments may release nutrients once exposed to rain events
- Invertebrates may not be able to migrate quickly enough with the changing water conditions and die
- May restrict access to mammals and birds

The ups and downs of Michigan inland lake levels

Jane Herbert, Michigan State University Extension - August 29, 2012

Different types of inland lakes may vary in response to the 2012 summer drought.

Lakefront property owners, and others who enjoy Michigan's 11,000 inland lakes, may be experiencing low water levels on their favorite lake this summer. Those who spend time on multiple lakes may notice that some lakes have been affected more than others by the drought.

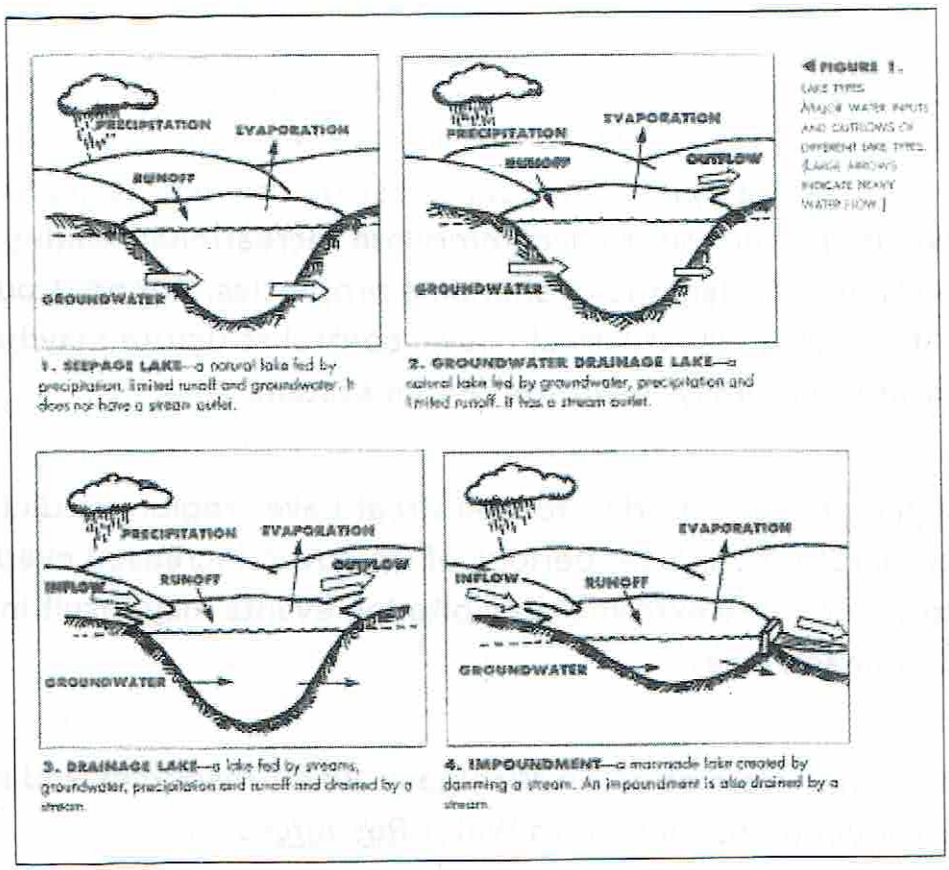


FIGURE 1. LAKE TYPES. MAJOR WATER INPUTS AND OUTFLOWS OF DIFFERENT LAKE TYPES. (LARGE ARROWS INDICATE HEAVY WATER FLOW.)

1. SEEPAGE LAKE—a natural lake fed by precipitation, limited runoff and groundwater. It does not have a stream outlet.

2. GROUNDWATER DRAINAGE LAKE—a natural lake fed by groundwater, precipitation and limited runoff. It has a stream outlet.

3. DRAINAGE LAKE—a lake fed by streams, groundwater, precipitation and runoff and drained by a stream.

4. IMPOUNDMENT—a man-made lake created by damming a stream. An impoundment is also drained by a stream.

Lakes of all types experience some degree of water level fluctuation in response to precipitation cycles. Surface evaporation is a key factor during hot summer months, but the potential range of fluctuation on a particular lake involves additional factors including lake type, water sources, and how lake levels are manipulated.

Lakes may be natural or man-made, and can be categorized into four different types (seepage lake, groundwater drainage lake, drainage lake or impoundment) as depicted in Figure 1. The relative contribution of groundwater and surface water sources influence the lake's response to precipitation events and cycles. Groundwater is the dominant source of water in seepage lakes (1) and in groundwater drainage lakes (2). Surface water is the dominant source of water in drainage lakes (3) and in impoundments (4).

2019 HIGH WATER LEVELS INFORMATION

FOR WETLANDS, INLAND LAKES, AND STREAMS PERMITTING

High water levels throughout Michigan have left several areas with flooding that has negatively affected residents and businesses, including homes, well and septic systems, farms, and roads. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has been collaborating on projects associated with both short-term and long-term solutions to flooding, and responding within our statutory authorities. EGLE does not typically have the ability to provide funding for flood relief projects. EGLE's role is to review permit applications for projects affecting wetlands, inland lakes, and streams. In critical cases, EGLE can expedite permit reviews and may issue emergency permits for projects that are intended to protect property and the public health, safety or welfare. However, EGLE also has the responsibility to ensure that these projects are completed in a manner that avoids and minimizes negative impacts to neighbors and the public trust resources of the state, including wetlands, inland lakes, and streams.

This Fact Sheet answers the following questions:

How can EGLE assist with flood alleviation projects?

Are permits needed for projects in wetlands, inland lakes, and streams?

What resources are available to gather more information?

What services does EGLE provide to help with permitting?

EGLE

Michigan Department of Environment, Great Lakes, and Energy

Water Resources Division

Michigan.gov/WRD

Vulnerable Flood Plain areas.

RE: south shore (Pennsauken Dr.)

BUILDING DIKES TO PREVENT MINOR SURFACE FLOODING

Standing water from melting snow or heavy rains can flood basements, and damage yards, wells, feed supplies, machinery and other property. Flooding is more apt to occur in areas with poor surface drainage, malfunctioning drainage systems, or ice dams.

A 1- to 3-foot-high sandbag or earth dike offers protection from shallow flooding (water depth less than 3 feet). Contact a construction firm, lumber yard, or Civil Defense officials for information on where to buy sandbags in the area.

A sandbag dike can be constructed as follows:

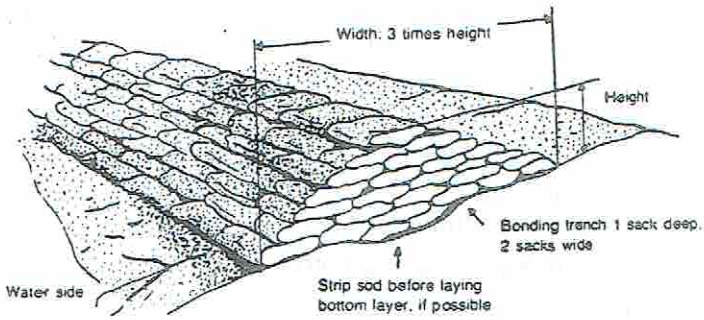
1) *Select the site* for the dike, making the best use of natural land features to keep it as short and low as possible. Avoid trees or other obstructions which would weaken the structure. Do not build the dike against a basement wall. Leave about 8 feet of space to maneuver between the dike and buildings.

2) *Remove ice and snow* (down to the bare ground if possible) from a strip of land about 8 feet wide.

3) *Fill and lap sandbags.* (See diagrams. If you are building the dike on a lawn you may omit the bonding trench.)
a) Fill bags approximately half full of clay, silt or sand. Do not tie.
b) Alternate direction of bags with bottom layer lengthwise of dike. Lap unfilled portion under next bag.
c) Tamp thoroughly in place.
d) Build the dike three times as wide as high.

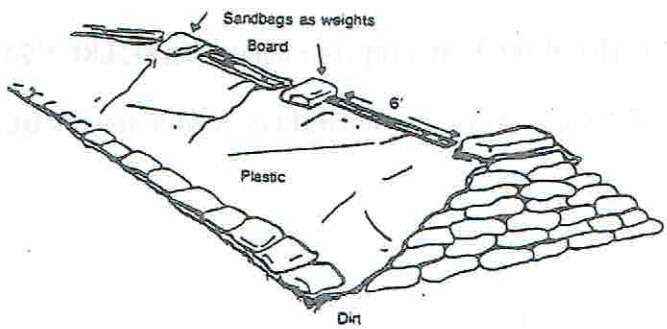
4) *Seal* the finished dike to increase its watertightness. (See diagram.) To seal the dike:
a) Spread a layer of earth or sand 1 inch deep and about 1 foot wide along the bottom of the dike on the water side.
b) Lay polyethelene plastic sheeting so that the bottom edge extends 1 foot beyond the bottom edge of the dike over the loose dirt. The upper edge should extend over the top of the dike. (This plastic sheeting, available from construction supply firms, lumberyards, and farm stores, should be about 6 mils thick. It comes in 100-foot rolls and is 8 or 10 feet wide.)

STACKING SANDBAGS

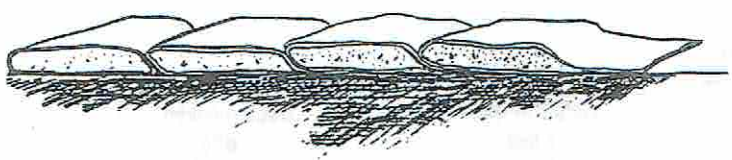


c) Lay the plastic sheeting down very loosely so that the pressure of the water will make the plastic conform easily with the sandbag surface. If the plastic is stretched too tightly, the water force could puncture it.
d) Place a row of tightly fitting sandbags on the bottom edge of the plastic to form a watertight seal along the water side.
e) Place sandbags at about 6 foot intervals to hold down the top edge of the plastic. Place boards or dirt between these sandbags to prevent winds from disturbing the plastic. As you work, avoid puncturing the plastic with sharp objects or by walking on it.

SEALING THE DIKE



HOW TO FILL AND LAP SANDBAGS



BAGS REQUIRED FOR 100 LINEAR FEET OF DIKE

Height of dike	Bags required
1 foot	800
2 feet	2,000
3 feet	3,400