

# DAM SAFETY NEWS

## Dam Failure Analyses and Floodplain Ordinances

Since the beginning of the Wisconsin Dam Safety program in 1986, a connection has been made between dams and floodplain management. Changes were made to Chapter NR 116 Wisconsin's Floodplain Management Program to include land use zoning downstream of dams in the local floodplain ordinance.

A dam failure analysis (DFA) is a study completed by an engineer registered in the State of Wisconsin which delineates the potential inundation area caused by the failure of the dam during the regional flood (100-year flood). The primary purpose of the analysis is to determine the number of people or amount of property at risk if the dam fails. A secondary purpose is to determine the hazard rating of the dam. A dam's hazard rating is based on the amount and type of development downstream and the existence of land use controls in the dam failure floodplain (hydraulic shadow). High hazard dams are those dams that could cause loss of life if the dam failed. Significant hazard dams are those that would cause significant property damage should failure occur. Low hazard dams are not expected to cause much damage from a failure. Zoning within the hydraulic shadow is required to secure a hazard rating of significant or low hazard.

Dam owners are notified of the requirement to complete a DFA as part of the inspection process, as a result of reconstruction, application for a grant or in an administrative order. It is the dam owner's responsibility to work with WDNR and the community to ensure the DFA is included in the local floodplain ordinance. If a DFA exists, then under Sections NR 116.08 and 116.09, Wisconsin Administrative Code, in most cases the community must include the area inundated by the failure analysis as an overlay to the local zoning map. The affected area must then be zoned and regulated as Floodway unless the area is specifically mapped otherwise.

Communities are required to include the DFA in the local floodplain ordinance in the Official Maps section (Section 1.5 (2)(b) of the 2012 Model Floodplain Ordinance). The map or study reference must include the name of the study or map, the date it was created and the name of the consulting firm which created the map or study. The DFA must be reviewed and approved by the DNR before it can be used for regulatory purposes and included in the ordinance.

Regulating land use downstream of a dam is beneficial to a dam owner. A dam's hazard rating is set based on the amount and type of development that could be damaged if the dam fails. High hazard dams must meet higher regulatory and construction standards than lower hazard dams. By having development regulated within the hydraulic shadow, a community can limit the risk to people and property if the dam fails and a dam owner can be ensured the dam's hazard rating will be unlikely to change. Also, property owners can avoid developing in high risk areas.

For information on Dam Failure Analyses contact the Water Management Engineer for your county. A list of WMEs by county can be found at: <http://dnr.wi.gov/topic/dams/regionalcontacts.html>. For information on amending a local floodplain ordinance contact either Gary Heinrichs at [gary.heinrichs@wisconsin.gov](mailto:gary.heinrichs@wisconsin.gov) or Miriam Anderson at [miriam.anderson@wisconsin.gov](mailto:miriam.anderson@wisconsin.gov).



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## Inspection, Operation and Maintenance Plans

There are over 3,500 dams in the State of Wisconsin. Many of these dams have the potential to cause the loss of life and considerable property damage if they were to fail. The best method of avoiding a dam emergency is proper inspection, operation and maintenance. An Inspection, Operation and Maintenance Plan (IOM) is an important step a dam owner can take to maintain the structural integrity and operational status of a dam as well as protect upstream and downstream lives and property, protect his/her investment and reduce liability.

All owners of large dams are required to develop an adequate IOM for each dam they own under Chapter NR 333, Wisconsin Administrative Code, Dam Design and Construction. Because ch. NR 333.07(3)(a) does not specify the components of an IOM, the Wisconsin Department of Natural Resources (Department) is developing a guidebook and template to assist dam owners in writing a plan which meets an accepted minimum standard.

Each IOM must be tailored to site specific conditions and the requirements of the owner, agency or organization that operates or regulates the use of the dam. Once the draft IOM is written, it must be sent to the Department Regional Water Management Engineer responsible for the county in which the dam is located for review and approval. Contact information for the Department Regional Water Management Engineers can be found at: <http://dnr.wi.gov/topic/dams/regionalcontacts.html>.

The Guide and template should be available for download by the end of March 2013 on the DNR website at <http://dnr.wi.gov/topic/Dams/documents.html>.

## Spring Flooding Outlook

The National Weather Service (NWS) has predicted above normal precipitation for February and a potentially wetter than normal spring (March - May) for the upper Mid-west in its January precipitation probability outlook. It is important for dam owners and operators to be prepared for the potential of high water. One way of keeping track of future weather patterns is the National Weather Service's Climate Prediction Center. The Center delivers climate prediction, monitoring, and diagnostic products for timescales from weeks to years to the Nation and the global community for the protection of life and property and the enhancement of the economy.

For a graphic display of the Three Month Outlook for temperature and precipitation go to: [http://www.cpc.ncep.noaa.gov/products/predictions/long\\_range/seasonal.php?lead=2](http://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=2)

For a technical discussion of the 30-day outlook go to: [http://www.cpc.ncep.noaa.gov/products/predictions/long\\_range/fxus07.html](http://www.cpc.ncep.noaa.gov/products/predictions/long_range/fxus07.html)

For the Long-Lead Forecast Release Schedule for 2013 go to: <http://www.cpc.ncep.noaa.gov/products/predictions/schedule.html>

The next monthly outlook will be issued on February 21, 2013 for March.

While long range forecasts are helpful, it is very important for dam owners to be aware of what is expected for the next few days. Your local NWS office can give you the most current detailed information for your area. Current weather conditions and short term forecasts on a site specific, community or county basis can be found at: [http://weather.noaa.gov/weather/WI\\_cc\\_us.html](http://weather.noaa.gov/weather/WI_cc_us.html).

## Spring Cleaning Tips

Spring cleaning is not just for the house. Dam owners also need to do some "spring cleaning" to ensure their dam is ready for the new season. Some spring cleaning tips include:

- Debris clean up – clean debris from the gates, spillways and other outlet structures. Debris accumulates all year, but it is very important to clear the branches, weeds and other accumulated debris from your dam before spring flooding. Debris in the spillway and gates severely reduces the capacity of the dam and often leads to overtopping during high flows.
- Gate operation – Check your gate operators. If you have chains to lift gates, be sure they are in good condition and will not fail if you are faced with opening gates or pulling logs. Get the grease gun out and lubricate the motors and gate stems. Find your gate wheels, keys to the fences, pike poles and gaff hooks and put them in a place that is easily accessible during a flood event.
- Structural inspection – Walk the dam and note problems that have developed during the winter months. Take pictures and document ice and freeze/thaw damage, scour, erosion, seepage or piping, and other changes that could affect how your dam operates, both under normal and flooding conditions. If you see serious problems, notify your consultant engineer now, before spring thaw.
- Review IOM/EAP – Review the documents you have developed for Inspection, Operation and Maintenance, as well as Emergency Action. Revise telephone lists, if necessary, and your list of suppliers for emergency resources. Make sure that you let everyone on the sign-off know changes you have made.



## Water Releases from Dams During Periods of Low Flow

Many areas of Wisconsin experienced lower than average rainfalls during 2012. The lower than average precipitation resulted in lower water levels in many lakes and rivers. Many dam owners and operators were forced to balance the minimum flow requirements set by state statutes and the wishes of recreational users and property owners.

All dam owners on navigable waterways are required under Section 31.34, Wisconsin Statutes, to release at least 25% of the natural low flow of the river through the dam at all times. This release level is required even if the level in the impoundment drops below ordered minimum levels. The law is intended to protect the public interest in downstream areas by insuring that a base flow is always passed through the dam. Dam owners can be subject to a fine of not less than \$50 nor more than \$1,000 per incident for failing to meet the release requirement.

It is important to note that some dams may be required to pass more flow if an existing order has been written by the Department. Also, the minimum flow requirements do not apply to dams where the water is discharged directly into a lake, mill pond, storage pond, cranberry marsh or as otherwise determined by the Department.

While the National Weather Service is projecting a wetter than normal spring, low flow conditions could reoccur in 2013. Your local Water Management Engineer can be a resource for information on operating a dam during low flow conditions. A listing of WME's by county can be found at <http://dnr.wi.gov/topic/Dams/contactInformation.html>.

## Dam Safety Database

The DNR Dam Safety Database is a great resource for dam owners and operators and others in the dam safety profession. The information in the database can be used when developing an emergency action plan or an inspection, operation and maintenance plan. The database can also assist dam owners in determining inspection schedules.

The Dam Safety Database can be accessed from the Dam Safety website at: <http://dnr.wi.gov/topic/Dams/damSearch.html>. Two searches have been developed to help determine the inspection schedules for state regulated, large dams and to provide selected database information for dams in the dam inventory.

The *Individual Dam Search* option can be used to view the inspection schedule for any dam and to export a report of selected database information for the dam. The search can be done in various ways such as by using the dam's common name, key sequence number or field file number. If dam specific information is unavailable or a broader search is needed, a search can be done by county.

The *Inspection Schedule by Year* option can be used to get a list of all dams scheduled for owner responsible inspections for any year, either state-wide or by county. The data returned can be sorted by column headings or exported to an Excel spreadsheet. A report of selected database information for any dam listed in the search can be viewed or exported to a PDF or Excel format.

In these searches and reports, two hazard rating columns are provided:

- Hazard Rating - the hazard rating has been formally assigned for this dam; and
- Estimated Hazard Rating - the estimated hazard is based on an assessment of the existing land use downstream of the dam

A dam may have a Hazard Rating "H" and an Estimated Hazard Rating "L". In most cases, this means that the existing development downstream is consistent with a Low Hazard Rating, but the dam was formally assigned a High Hazard Rating because there were not adequate land use controls in place to prevent development in the inundation area downstream of the dam. NR 333.06 requires consideration of land use and land use controls when setting a hazard rating.

## Dam Emergency – Who Do You Call?

If despite your best efforts at maintaining your dam, an emergency arises, the first thing to do is to open your Emergency Action Plan (EAP) and follow the steps outlined. If for some reason, you do not yet have an EAP for your dam and failure is imminent, then call 911 and be prepared to provide the following information to the 911 operator:

- name and title of the person reporting the incident;
- callback number of the person reporting the incident
- name/location of the dam including county, waterbody and nearest road; and
- present condition of the dam such as perceived problem, gate status or level of pond in relation to low point in the embankment.

***Under any circumstance, if failure is imminent, call 911 first!  
And then call .....***

**Wisconsin Emergency Hotline  
1-800-943-0003 (24 hour)  
Press "1"  
Ask for "DNR Duty Officer"**

## DNR Staff Changes

Over the past year there have been a number of changes in the Dam Safety Section. Two new engineers have been hired for the Eau Claire and La Crosse offices. Also, county assignments have been shifted in order ensure each county was covered. A complete list of Water Management Engineers by county can be found on the WDNR Dam Safety website at: <http://dnr.wi.gov/topic/dams/regionalcontacts.html>.

Dustin DeFelice was hired as a Water Management Engineer for the West Central Region - Eau Claire. He is a recent graduate from UW-Platteville majoring in Environmental Engineering and was previously employed at the university farm where he conducted numerous studies within the hydraulics lab, focusing mainly on their extensive surface-water runoff program. In his new position, Dustin will provide dam safety, floodplain management, and engineering assistance to the Water Regulation Program. His contact information is Wisconsin Department of Natural Resources, 1300 West Clairemont Avenue, Eau Claire, WI 54702, (715) 836-7574, [Dustin.defelice@wisconsin.gov](mailto:Dustin.defelice@wisconsin.gov).

Jordan Thole was hired as a Water Management Engineer for the West Central Region - La Crosse. He is recent graduate from UW-Platteville with a bachelors degree in Environmental Engineering. He was recently employed by a private firm out of Madison working as a stormwater and wastewater engineer. In his new position, Jordan will provide dam safety, floodplain management, and engineering assistance to the Water Regulation Program. His contact information is Wisconsin Department of Natural Resources, 3550 Mormon Coulee Road, La Crosse, WI 54601, (608) 789-2649, [Jordan.thole@wisconsin.gov](mailto:Jordan.thole@wisconsin.gov).

## WDNR Dam Safety Program

# 2013 Dam Safety Workshops

The purpose of the workshops are to educate dam owners/operators and others in the dam industry about basic dam terminology and design, common maintenance issues and how to write and use Inspection, Operation and Maintenance Plans (IOM) and Emergency Action Plans (EAP). The workshops will also provide an opportunity for dam owners/operators to meet one on one with WDNR Dam Safety staff, if desired.

The workshop cost is \$20.00 and includes lunch. Attendees will receive a CD with course materials and other materials related to dam safety, IOMs, EAPs, permitting and inspections.

### LOCATIONS and DATES

April 3, 2013	Lussier Heritage Center Main Level 3101 Lake Farm Road Madison, WI
April 4, 2013	Cranberry Country Lodge Blossom Room #403 319 Wittig Road Tomah, WI
April 16, 2013	Ladysmith Public Library East Room Lower Level Community Rooms 418 Corbett Avenue Ladysmith, WI
April 17, 2013	Shawano County Courthouse Lower Level Meeting Room 311 Main Street Shawano, WI

### AGENDA

8:00 – 8:30	Registration/Coffee Session 1 Course Introduction/Basic Dam Terminology and Design Session 2 Common Maintenance/Operation Issues Break Session 3 Inspection Operation and Maintenance Plans
11:45 – 12:30	Lunch provided Session 4 Common Emergency Issues Session 5 Emergency Action Plans
2:45 – 3:00	Wrap up
3:00 – 5:00	One on one discussions with WDNR staff

Questions regarding registration contact the Association of Dam Safety Officials at (859) 257-5140 or <http://www.damsafety.org/> and click on *Register for Training*. The access code is WIDAMS.

Questions concerning workshop materials, professional development hours for Wisconsin registered professional engineers, etc. contact WDNR at [DNRDAMSAFETY@wisconsin.gov](mailto:DNRDAMSAFETY@wisconsin.gov).

## Governor's Conference on Emergency Management and Homeland Security

This year's Governor's Conference on Emergency Management and Homeland Security will be held March 7-8, 2013 with a training day on March 6<sup>th</sup>, at the Chula Vista Resort in Wisconsin Dells. The conference will cover a variety of subjects ranging from flooding response best practices to cyber security.

To register for the Conference go to: <https://www.trainingwisconsin.org/index.aspx?>. You will need to create an account to register if you don't already have one. The Governor's Conference may be found under "Schedule". Click on the dates in March and begin to register. If you have questions regarding registration, please contact David Nunley 608/242-3213 or [david.nunley@wisconsin.gov](mailto:david.nunley@wisconsin.gov).

WDNR Dam Safety/Floodplain Management staff will also be available to answer questions at the WDNR Dam Safety/Floodplain Management Exhibitor Booth throughout the conference.

## Lakes Partnership Convention

The 35th annual Wisconsin Lakes Partnership Convention will be held April 9-11, 2013 at the KI Convention Center in Green Bay. The event is sponsored by the Wisconsin Lakes Partnership, a nationally recognized and successful collaboration of the University of Wisconsin Extension, Wisconsin Department of Natural Resources, and Wisconsin Lakes. The Convention brings together lake enthusiasts from across the state to explore lake policy updates, research advancements, management tools, and educational initiatives.

This year's theme is "We're All In This Together: Celebrating Diversity". Presenters and exhibitors at the conference will be exploring the many different aspects of Wisconsin's wonderfully varied lakes - the diverse flora and fauna, the diverse people who love them, and the many ways people recreate in and around Wisconsin's waters.

To download the conference brochure and to register for the convention go to: <http://www4.uwsp.edu/cnr/uwexlakes/conventions/>. WDNR Dam Safety staff will be conducting a Technical Session on Tuesday, April 9 from 4:30 - 5:30 PM. The session will focus on inspection, operation and maintenance plans for dam owners. Staff will also be available to answer questions at the WDNR Dam Safety/Floodplain Management Exhibitor Booth throughout the convention.

## Email Notification of Updates

Wisconsin *Dam Safety News* is planning to be an electronic-only newsletter highlighting news and updates for dam owners, consultants, and other interested parties. If you are interested in receiving this newsletter via email, please go to <http://dnr.wi.gov/topic/dams/newsletters.html> to subscribe. Click on "Subscribe to DNR Updates" and then choose "Dam Information". Copies of this newsletter in PDF format can be found at: <http://dnr.wi.gov/topic/dams/newsletters.html>.

**If you already receive the *Dam Safety News* electronically, please notify the WDNR at [DNR.DAMSAFETY@wisconsin.gov](mailto:DNR.DAMSAFETY@wisconsin.gov) to be removed from the paper mailing list.**

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For further information regarding the WI Dam Safety Program, please visit our website at: <http://dnr.wi.gov/topic/dams/> or email: [dnrdamsafety@wisconsin.gov](mailto:dnrdamsafety@wisconsin.gov).

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