General Guidance for Vulnerability Analysis

This document offers general guidance to conduct a vulnerability analysis (VA) due to high water levels expected in 2020 in the Great Lakes Basin. The purpose of a VA is to identify any potential impacts to a permittee's ability to meet permit requirements and other applicable regulations, due to high water levels. An effective VA incorporates any necessary planning, preparation, and response activities aimed at addressing the identified potential impacts. The guidance below is divided by type of National Pollutant Discharge Elimination System (NPDES) permit and highlights some issues that permittees might encounter due to high water levels. NPDES permits might have specific situations that this guidance does not address. Please note that certain NPDES permits will not see any impact from higher water levels (e.g. inland, not affected by higher river flow, etc.). Regardless, it is good to evaluate if your facility has any concerns. This document may be changed as the Water Resources Division, WRD, and permittees learn more with time.

Storm Water Permits (Industrial Storm Water, Municipal Separate Storm Sewer System, and Construction Storm Water)

- Conduct routine maintenance to ensure best management practices (BMP) can store maximum design volume (remove sediment, dredge, increased maintenance of the inlet and outlet).
- Evaluate secondary containment and ensure an adequate height.
- Check the standpipe elevation, or weir elevation. Determine that they will not be affected by high water elevations.
- Move any polluting material away from potential high water and/or rainfall. Per Part 5, Spillage of Oil and Polluting Materials, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, solid polluting materials shall not be stored within 50 feet of a designated wetland or the shore or bank of any lake or stream. Solid polluting material containment structures located within the 100-year floodplain shall be designed and constructed to remain effective during a 100-year flood.
- Ensure that future water elevations are considered for BMP installations
- Require/Implement low impact development and install green infrastructure to preserve natural features and minimize impervious surfaces
- Disconnect impervious surfaces and direct runoff to BMPs close to the source

Industrial Permits (Facilities, Non-contact Cooling Water, Commercial Facilities)

- Check the hydraulic profile of the treatment system. Ensure that maximum authorized flow in the permit can be effectively processed (consider ability to process and permit monitoring requirements)
- Remediation can be offered if needed by reducing production, or instead providing adequate pumping if necessary.

Municipal Wastewater Treatment Plants (WWTP) and Collection Systems

- Check the hydraulic profile of the treatment system. Ensure that maximum authorized flow (daily maximum flow) can be effectively processed (consider ability to process and permit monitoring requirements). The facility may need to pump treated effluent if receiving water levels are high enough to impede flow.
- Determine if high water can enter the collection system through combined or separate outfalls, and if this inflow can negatively affect WWTP performance to meet all permit conditions at the 25 year - 24 hour event. (Raise weirs, dams, or otherwise control inflow).
- Determine if higher groundwater tables are causing infiltration and inflow (I/I). If so, then institute programs as needed to mitigate. Consider the peak capacity of the WWTP (see bypass provision in the permit). Some of these may be longer-term programs.
- Evaluate if the WWTP and collection system pump stations remain fully operational and accessible at the 25-year flood elevation, and that all systems (including structures, electrical, and mechanical equipment) are protected from physical damage by the 100-year flood elevation. Michigan Building Code Requirements (see G401.3) may apply and should be considered.
- Review collection system maps to determine whether sewers or other infrastructure are located in areas that may be vulnerable to erosion.
- Note that Rule 59, Emergency Measures, Reports to Department, promulgated pursuant to Part 41, Sewerage Systems, of the NREPA (R 299.2959) that any discharge of pollutants in excess of those authorized by the discharge permit be environmentally mitigated.
- Ensure all formerly bulkheaded combined sewer overflow (CSO) outfalls that may now be submerged due to high water are watertight to prevent inflow from entering the sanitary sewer system.

CSO Retention Treatment Basins

- Determine if the hydraulic profile of the treatment system is affected by high water elevations.
- Determine if weirs need to be raised to prevent inflow of high water, but consider the hydraulic risk in the collection system.

Septic systems

- Evaluate if drain fields that are part of treatment systems are affected by high water. Determine if there is mitigation available.

Pesticides Application

- Determine if any NPDES permitted application might not be authorized because of high water inundation and/or connectivity to flowing surface waters.
- Determine potential for higher water tables to impact setback areas for terrestrial pesticide use patterns.

- Identify pesticides labeled with precautionary groundwater leaching statements and assess impact to future projects.

Aquatic Nuisance Control Program

- Determine if high water application might affect land that is normally above the high water mark elevation. Adjust program appropriately.
- Evaluate if increased treatment area size may initiate NPDES Permit requirements. Coordinate with staff of WRD's Water Quality and Aquatic Nuisance Control Permits Unit.