

EAU CLAIRE LAKES LAKE MANAGEMENT PLAN



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GLOSSARY

Best Management Practice (BMP):	A practice or combination of practices that is determined to be most effective and practical (including technological, economic, and institutional considerations) means of controlling point and nonpoint pollutant levels compatible with environmental quality goals.
Drainage Basin:	A geographic and hydrologic subunit of a watershed.
Dry Detention Ponds:	A structural BMP or retrofit that consists of a large open depression that stores incoming storm water runoff while percolation occurs through the bottom and sides.
EPA:	United States Environmental Protection Agency.
Groundwater:	Subsurface water occupying the zone of saturation, i.e. those sediments below surface in which water occupies 100% of the pore space.
Heavy Metals:	Metallic elements with high atomic weights (e.g. mercury, cadmium, etc.). They can damage living organisms at low concentrations and tend to accumulate in the food chain.
Impervious Surface:	Hard surface that prevents and retards the entry of water into the soil mantle as natural conditions prior to development and/or a hard surface area that causes water to runoff the surface in greater quantities or at increased flow rates from the flow present under conditions prior to development. Common impervious surfaces include, but are not limited to rooftops, walkways, patios, driveways, parking lots, storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam, or other surfaces that similarly impede the natural infiltration of urban runoff.
Infiltration:	The penetration of water through the ground surface into subsurface soil or the penetration of water from the soil into sewer or other pipes through defective joints, connections, or manhole walls.
Land Conversion:	A change in land use, function or purpose.
Local Government:	Any County, City, or Town having its own incorporated government for local affairs.
Nonpoint Source Pollution:	Pollution whose sources cannot be traced to a single point such as a municipal or industrial wastewater treatment plant discharge pipe.
Pollution Prevention:	A management measure to prevent and reduce nonpoint source loadings generated from a variety or everyday activities within urban

areas. These can include turf management, public education, ordinances, planning and zoning, pet waste control, and proper disposal of oil.

**Post-Development
Peak Runoff:**

Maximum instantaneous rate of flow during a storm, after site development is complete.

**Pre-Development
Peak Runoff:**

Maximum instantaneous rate of flow during a storm prior to site development activities.

**Removal
Efficiency:**

The capacity of a pollutant (sediment) control device to remove pollutants from wastewater or runoff.

Retrofit:

The modification of a runoff management system in a previously developed area. This may include wet ponds, infiltration systems, wetland plantings, streambank stabilization, and other BMP techniques for improving water quality and creating aquatic habitat. A retrofit can consist of new BMP construction in a developing area, enhancing an older runoff management structure, or combining improvements and new construction.

Runoff:

That part of precipitation, snow melt, or irrigation water that runs off the land into streams or other surface water. Runoff can carry pollutants into receiving waters.

**Sedimentation
Basins:**

Sediment storage areas that may consist of wet detention basins or dry detention basins. Excavated areas with storage depression below the natural ground surface; creek, stream, channel or drainageway bottoms properly engineered and designed to trap and store sediment for future removal.

Watershed:

A drainage area or basin where all land and water areas drain or flow toward a central collector such as a creek, stream, river or lake at a lower elevation.

**Wet Detention
Ponds:**

A structural BMP or retrofit that consists of a single permanent pool of

Ponds:

Water that stores and treats incoming storm water. Wet detention ponds usually have three to seven feet of standing water, allowing pollutants to settle, with a defined siltation/sedimentation pond and outlet structure.

CHAPTER 1: INTRODUCTION

Located in Northwestern Wisconsin, the outstanding resource waters of the Upper, Middle, and Lower Eau Claire Lakes are located in the Upper St. Croix and Eau Claire Rivers Watershed (designated as SC-18). This is a large watershed extending from south central Douglas County into southeastern Bayfield County in the northern headwaters of the St. Croix Basin.

The St. Croix Basin

The St. Croix Basin extends from northwestern Wisconsin to northeastern Minnesota, encompassing the water sheds of the St. Croix and Namekagon Rivers. In 1968, under the National Wild and Scenic Rivers Act, the St. Croix River, including the Namekagon River, was designated as a National Scenic Riverway. The Wisconsin DNR adopted this surface water designation as outstanding resource waters under the national wild and scenic rivers category of ch. NR 201.10(1)(a)1, Wis. Admin. Code. The Wisconsin section of the basin contains 22 watersheds covering an area of 4,165 square miles over nine counties (DNR 2002).

The Upper St. Croix and Eau Claire Rivers Watershed

This watershed contains the headwaters of the St. Croix Basin. The headwaters include the Upper St. Croix Lake and three major lakes in the Eau Claire Chain of Lakes.

The Eau Claire Lakes

The natural resources of the Upper, Middle, and Lower Eau Claire Lakes are a defining feature for the Town of Barnes. The Eau Claire Chain is comprised of the Upper Eau Claire, Middle Eau Claire, and Lower Eau Claire Lakes, as well as eight smaller connecting lakes for a total surface area of 3,488 acres of waters. These lakes are the headwaters of the Eau Claire River and, as previously mentioned, are recognized as outstanding resource waters. These clear lakes are connected by streams with the Middle and Lower Lakes connected through a navigable channel controlled by a mechanical small boat lock.

Water quality appears to decline slightly moving downstream in this chain. The Upper Lake shows signs of oligotrophic characteristics while the Middle and Lower Lakes show signs of increasing levels of fertility. Due to signs of deterioration in water quality, the Upper and Lower Lakes have been regularly monitored since 1986 through the WDNR's long term lake water quality monitoring program. Middle Eau Claire Lake has been monitored by a self help volunteer program since 1988. The lake area residents are represented by the Barnes-Eau Claire Property Owners Association and constantly participate in lake management activities.

Surface water quality is a direct reflection of the quality of the surrounding environment. Therefore it stands to reason that lake water quality is dependent on the quality of the water entering the lake from river, streams, dry swales, over land flow, and ground water; i.e. the surrounding watershed. This assessment of current and future lake water quality conditions is being presented in a watershed approach. This report documents much of the information gained through multiple studies and assessments of the lakes and the watershed. The intent is to provide a dynamic document that can be altered as needed as more information becomes available in the future.

This work could not have been completed without the efforts and support of:

- Bayfield and Douglas Counties
- the Board and Chair of the Town of Barnes
- the Planning Committee of the Town of Barnes
- the Board and Chair of the Barnes-Eau Claire Lakes Association
- the Wisconsin DNR
- concerned citizens and local organizations

1.1. What is a “Watershed?”

Merriam-Webster’s Dictionary defines a watershed as “a region or area bounded peripherally by a divide and draining ultimately to a particular water course or body of water.” Watersheds are defined by those ridgelines and/or high points of land that separates lower land areas. The line that connects through the high points is the watershed boundary. Large watersheds are a combination of many smaller sub-watersheds.

With the watershed defined, soils and land use within the watershed can be compiled and with the evaluation of precipitation and run off calculations, an assessment of the impacts of land use on the water quality within the watershed can be made. The advent of high speed computers and complex mathematical algorithms accents this understanding by allowing the complex inter-relationship of water runoff and infiltration and nutrient (pollutant) loading to be calculated.

Accepting that man’s imprint on the surface of the watershed affects the water quality draining from the watershed is a necessity in understanding the effects of water quality degradation in the water courses and basins receiving this water – our lakes, rivers and impoundments.

1.2. What is Runoff?

Rainfall and snow melt are generally termed “runoff” and either runs off the land or infiltrates into the subsurface. In the hydrologic cycle (Figure 1-1), runoff water is termed “overland flow.” As land is developed, less land area is available for infiltration of storm water, thus runoff increases.

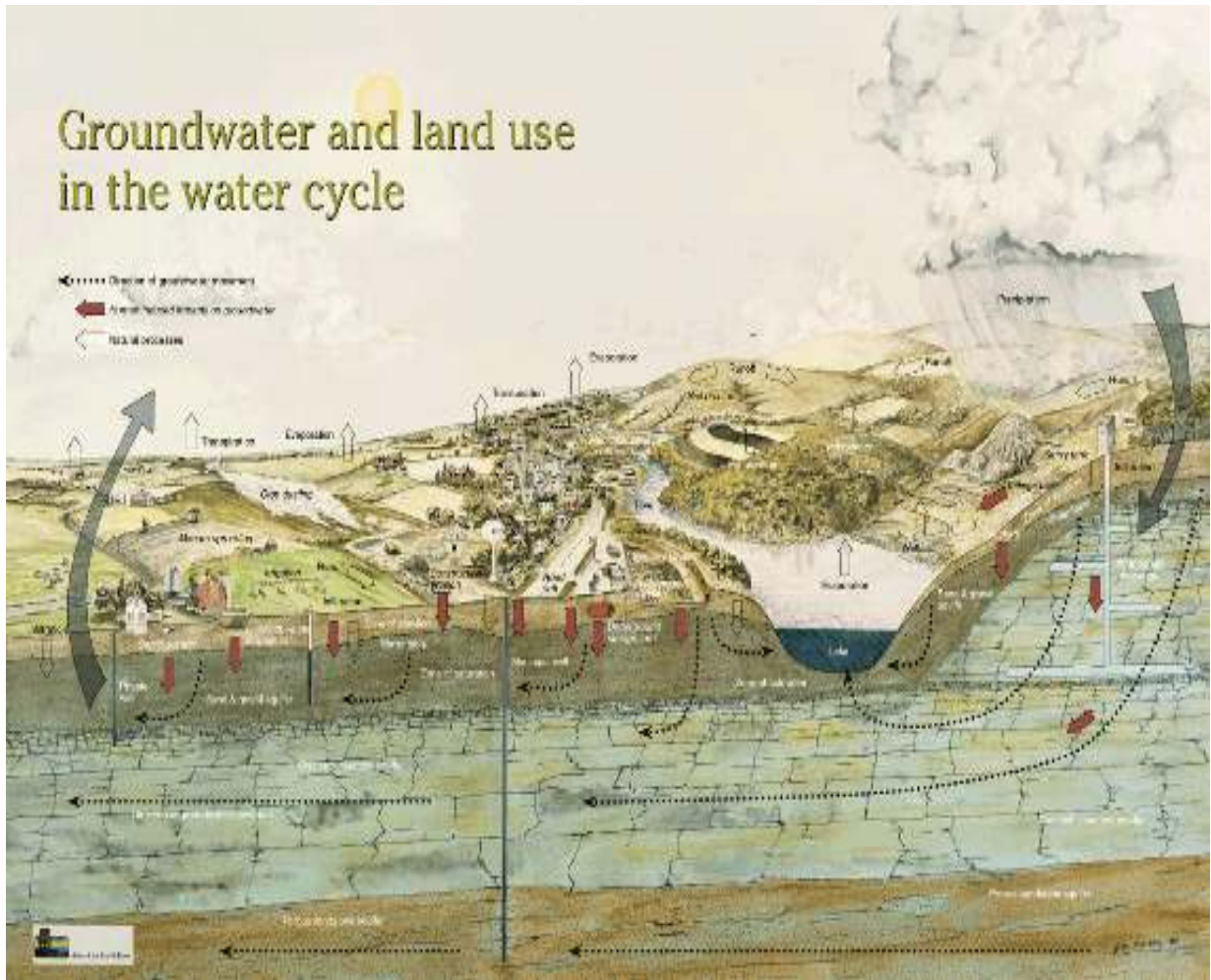


Figure 1-1: Hydrologic Cycle

Runoff water drainage systems are incorporated in developed areas as a preventive action to minimize localized flooding. These drainage systems may discharge through an individual or local outfall to a surface water body or swale, or may runoff the land as overland flow. Runoff water quality, however, has not been much of a concern until the last 15 years. Early in the 1990's, the U.S. Environmental Protection Agency (EPA) defined contaminated surface runoff water as one of the greatest threats to our ecology.

Initial concerns focused on the obvious areas of high population density. However, with continued investigations, the evaluation of runoff water quality in all developed and developing areas has become recognized as a major environmental concern. Nutrient and sediment contributions from developed areas in the Mississippi River basin are noted as the source of the 6,000 to 7,000 square mile dead zone found at the mouth of the Mississippi River in the Gulf of Mexico.

This huge area of low dissolved oxygen (less than 2 ppm) no longer supports typical aquatic plant life and is listed as the largest dead zone found in the world. The principal contamination that has caused this problem are sediments and nutrients in storm water runoff.

1.3. Runoff Water Regulation Driven by Water Quality

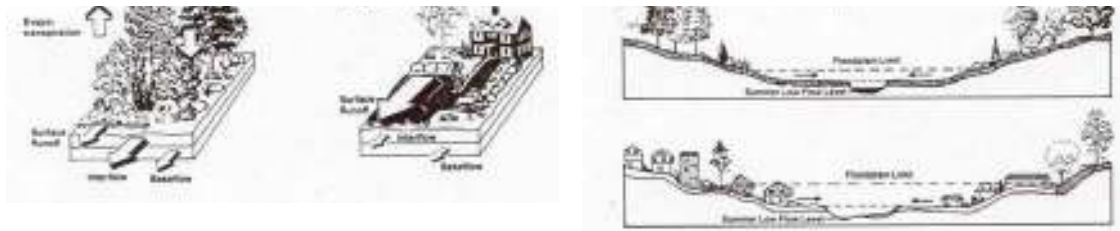
With runoff water targeted by the U.S. EPA as a major contributor to the degradation of surface water quality in our environment, the Wisconsin Department of Natural Resources (WDNR) introduced and now administers, through Wisconsin Administrative Code (WAC) NR 151 and NR 216, the quality of surface runoff water. Regulations for the discharge of storm water are already in place for larger municipal separate storm sewer systems (or MS4s) and have also been introduced in smaller “urban areas,” which have been defined by EPA and WDNR as “an area with a population density of 1,000 or more per square mile, or an area of industrial or commercial uses, or an area that is surrounded by an area described in this definition” (WAC NR 155.12 (31)). Regulations for storm water runoff control are less defined for developments that also disturb one acre of land surface. Some counties are now enforcing these regulations for areas in excess of one-half acre.

The Town of Barnes is currently not identified by the WDNR as a community that will be required to enact storm water management. However, in the interests of protecting and improving water quality in the Eau Claire Lakes, the Town of Barnes and the Barnes-Eau Claire Lakes Association is pursuing this evaluation of watershed runoff water quality and its affects on the lake water quality. The results of this effort will be shared with the Town, Lake Association, Bayfield County, and other communities in the Watershed. The goal is to develop maintain and improve lake water quality through guidelines, ordinances, and water quality improvement projects.

1.4. Water Runoff Management

We have all seen drainage swales and swells swollen with brown turbid water after a storm. The sediment load in the runoff is the culprit that turns the water brown and is increasing nutrient loading in the lakes and decreasing water depth. Traditionally, the objective of runoff water management has been flood or water quantity control, that is, to transport runoff as quickly as possible through the drainage system to prevent flooding and protect lives and property. Although public health and safety are still the most important goals, other objectives, such as the preservation of water quality, groundwater, and natural habitat, must be considered. Existing flood and water quantity control methods are not always readily adaptable to meet these new requirements, because the historic methods contribute to increased downstream water quantity, generate water quality problems, and do not provide for habitat protection. Likewise, some recommended water quality and habitat solutions, such as naturally vegetated drainage ways, can contribute to upstream flooding problems by reducing the carrying capacity of the drainage conveyance. Figure 1-2 shows the impacts of urbanization throughout a watershed and the increase in water runoff reflects the change in waterways that flow through an urbanized area.

Figure 1-2: Water Balance, Stream Flow, and Stream Geometry; Source: Schueler, 1987



It is necessary to achieve a balance for both water quantity and water quality objectives. This balance is achievable through regional solutions, including effective land use planning to minimize impervious areas and preserve natural vegetation, and the protection of natural areas along streams and lakes. Local ordinances and codes can be enacted and enforced to reduce impervious areas and increase vegetation by limiting the extent to which a site can be developed. Education of watershed residents, governing bodies, developers and visitors about their concern will answer many questions why changing old habits is necessary. Water quantity and water quality goals can also be met at the local level through proper construction site planning and appropriate design that carefully considers the various impacts of development and application of BMPs (Best Management Practices) to minimize water quality impacts. BMPs are recognized administrative and engineering devices that minimize the impacts of polluted runoff on receiving waters. BMPs have been developed for many common problematic situations and are readily incorporated into today's construction design plans. Examples include siltation fences, water velocity checks such as hay bales in swales, sediment retention basins, etc.

1.4.1. Water Quantity

The quantity or volume of water runoff generated by varying land uses depends on three factors: (1) the intensity of a given runoff event; (2) the duration of the event; and most importantly (3) the amount of impervious area present. Impervious surfaces include asphalt and concrete, building rooftops, compacted soils, etc. Lawns are considered semi-impervious as the reworked soil becomes compacted over time. As impervious surfaces increase with development, the quality and velocity of runoff water increases and the water quality decreases, and therefore the runoff from increasingly developed areas has a serious impact on receiving waters. As shown in Figure 1-2, the natural water balance is disrupted when an area is developed. Compacted soils, paved surfaces, and buildings replace vegetation that once intercepted runoff, allowed it to infiltrate into the ground, and returned water to the atmosphere through evapotranspiration. Compacted soil surfaces, such as well-used pastures and compacted lawns, also reduce the infiltration capacity of soils as does asphalt and concrete surfaces. Snowmelt and heavy rain events on these compacted surfaces increase the chance of flooding. As the volume and flow rate (velocity) of the runoff increases, water reaches streams and lakes more quickly. The higher runoff volumes and rates lead to overland erosion, scouring or undercutting of stream banks, flooding, and loss of habitat. Less obvious is the lack of replenishment of ground water. Lack of

ground water reduces the quantity of groundwater to contribute base flow to streams, sustain lake levels, and maintain ground water elevation (essential for well supplies).

1.4.2. Water Quality

Land development practices adversely affect the quality of runoff water by increasing runoff volume which carries increased erosion and results in more rapid transfer of pollutants to receiving water. Pollutants include the many chemicals and metals we consider pollution as well as nutrients (phosphorous and nitrogen). Nutrient enhancement of surface water occurs through manure spreading, septic systems, fertilization, animal pasturing, etc. The pollutants of concern include:

- *nutrients* such as phosphorus and nitrogen, which hasten the lake aging process (or eutrophication); this process naturally results in increased algae and plant growth
- *sediment* such as silt (fine particulates), sand, and gravel, which has the capacity to carry other pollutants and can smother fish eggs, also results in shallower lake water
- *bacteria and viruses* from humans and animals
- *organic chemicals*, such as pesticides and hydrocarbons (dissolved in water or adsorbed to the sediment)
- *heavy metals* such as lead, copper, zinc and cadmium, among others, that are usually adsorbed on the grains of sediment are redistributed in ponds and lakes after high runoff events

Sources of runoff water pollutants from developed areas include, but are not limited to:

- automobiles and related surfaces – roads, parking lots, service areas
- rooftop runoff
- residential impervious surfaces
- lawns and areas adjacent to lakes and streams
- construction and new development activities
- atmospheric fallout from vehicle and industrial emissions
- dust from construction/logging/agricultural activities
- overuse and improper disposal of toxic chemicals, pesticides, herbicides, and fertilizers
- illegal discharges to storm sewer systems
- decaying plants and animal wastes from natural and agricultural sources
- disturbed or exposed soils

1.5. Objectives of Lake Watershed Management Planning

This Plan presents general *technical guidelines*. Specific conditions will require site-specific modifications of the practices described or an alternative practice that is approved by a local permitting authority. The Barnes-Eau Claire Lakes Watershed Management Plan provides a discussion of existing conditions and recommendations for runoff water and lake water quality protection and improvements. The Plan is intended as a reference and a guide for water quality and quantity professionals as the community continues to develop within and beyond the local Watershed. We say beyond because this Plan considers only the local Watershed for the Eau Claire Lakes area. Also affecting water quality in these Lakes are Watershed activities upstream of the Eau Claire Lakes area. This area, although less developed now, is a future area of development. The need for planning water quality improvements is now, such that future developments can be designed to improve future runoff water quantity and water quality to protect and preserve the character of these lakes and other surface waters.

There are several reasons why technical guidance regarding watershed water quality management is necessary:

Location: The Eau Claire Lakes watershed is principally located in the Town of Barnes, Bayfield County with the west portion and the discharge of the watershed located in the Town of Gordon, Douglas County, in northwest Wisconsin.

Tourism: The beautiful Eau Claire Lakes chain consists of 10 lakes in 3,488 acres with 45 miles of shoreline for everyone to enjoy. To maintain the attractiveness of the area, one of the most important tasks is to maintain or improve the quality of surface water in the area.

Growth: Because of its natural beauty, the Towns of Barnes and Gordon have and will continue to experience a rapid growth in both relocation and tourist activity. This area is growing fast; 29% from 1990 to 2000 and it is projected to increase by over another 50% by the year 2030. In addition to a steady growth of residents, the area attracts a large number of tourists. Tourists, who become seasonal visitors, and eventually permanent residents, are seen as the primary population growth. Keeping in mind that the population growth will be concentrated in the Eau Claire Lakes watershed, planning for proper runoff water management is necessary to address the anticipated increase in runoff water as land use development increases.

Development: This watershed is experiencing greater development pressure due to its natural beauty and its proximity to major highways providing rapid access to high density population areas. Rapid population growth translates to rapid land development, which is a recognized source of nonpoint source pollutions, or “polluted runoff.” The Plan proposes BMPs (best management practices) to minimize the discharge of pollutants from developing areas, both during the construction phase and for the life of the development. In many cases, these BMPs can be used just as effectively to reduce polluted runoff from existing land development.

Water Quality Concerns: Many water bodies throughout the state are not in compliance with state water quality standards. Beneficial uses such as domestic and agricultural water supply, fishing, swimming, and boating, can be impaired due to excessive pollutants carried into the lakes and streams by storm water runoff. This Plan provides guidance for controls through the use of BMPs to reduce these pollutants, with special consideration for total phosphorus and total suspended sediments.

1.6. Components of Watershed Planning (from *The Wisconsin Storm Water Manual*)

The Barnes-Eau Claire Lakes Area Property Owners Association is recommending the adoption of runoff water planning and controls with the presentation of this Plan to the local Townships. The adoption of this Plan will require:

- Land Use Planning
- Performance or Design Criteria for Runoff Water Best Management Practices (BMPs)
- Financing Mechanisms
- Storm Water, Nutrient, and Erosion Control Ordinances

Before completing any component of the Plan, the Protection Association recommends the Townships develop an outline for a Runoff Water Management Plan. There are four fundamental elements to consider when protecting human and environmental concerns:

- Flood Control
- Water Resource Protection
- Generic Nonpoint Source Pollutant Control
- Specific Nonpoint Source Pollutant Control

1.7. Updates to the Plan

The practice of lake watershed water quality management is quickly evolving and this Plan must be updated as new information is available. Design information for various BMPs (Best Management Practices) is expected to change as more people apply the practices and learn from their experience. New BMPs will be developed for specific situations that will improve runoff water quality. The Plan should be considered dynamic and regular updates incorporated.

CHAPTER 2: PHYSICAL ENVIRONMENT

Lake Watershed Management requires understanding the existing conditions and resources within the select watershed boundaries. Thus, understanding the physical environment and the history of the Eau Claire Lakes Watershed is critical to determine the policies and standards that best protect the water resources of this Watershed while meeting the needs of local inhabitants.

Time, geologic processes (plate tectonics, glaciations, and erosion), and the biology of the region have defined the physical environment of the Eau Claire Lakes Watershed over the course of the past 500 million years. The distribution of bedrock, unconsolidated (loose) sediments, landforms, and structural features in the watershed are the geologic backbone on which the biological and human environments exist. The characteristics of the physical environment ultimately determine the availability of natural resources, the susceptibility of resources to pollution, and success of organisms living in the watershed.

2.1. Bedrock Geology

Underlying the unconsolidated surficial sediment is bedrock. The bedrock in the Town of Barnes consists of the Early Proterozoic Age (1630-1880 million years ago) sequences. Specifically, two Early Proterozoic Age formations are found in the Eau Claire Lakes Watershed. These are Keweenawan Sandstone and Keweenawan Basalt. Both sequences are highly metamorphosed. Archean gneisses may underlie the surface in the eastern parts of the Watershed.

2.2. Geomorphology and Surface Geology

The relief (variation in height and slope), or geomorphology, of the landscape establishes watershed drainage patterns and drives the local hydrologic (water) cycle. The Barnes-Eau Claire Lakes area is characterized by its lack of residual soil and the abundance of a transported, glacial soil. Rapids and waterfalls are abundant in the streams. There are large undrained inter-stream areas. Lakes and swamps are found everywhere. The drainage pattern is most irregular, resembling nothing systematic, as is perfectly normal for a youthful drainage system. Topographic maps completed by the USGS and others define these surfaces.

Surface geology is the description and mapping of the distribution and physical properties of earth materials that are exposed at the surface. In the Eau Claire Lakes Watershed, this is the partially unconsolidated (loosely arranged or uncemented) sediments such as the sand and loamy sands existing above the sub-surface bedrock interface. Throughout time, the forces of wind, water, and ice have modified the landscape of the Eau Claire Lakes Watershed. The most recent influential process to shape the topography of the watershed was the movement of continental ice sheets. During the Pleistocene Epoch (between 2 million and 10,000 years before present), glaciers repeatedly covered most of northern Wisconsin. Generally, only the effects of most

recent glacial advance and retreat are evident in the land's surface topography as the most recent glacial advance erases the signatures of previous events.

Glacial outwash deposits cover vast areas in this area referred to as the Northern Highland. In the Barnes area, the surface geology is mapped as the Copper Falls Formation that is typically cross-bedded sand and gravel deposits that are typically 11,000 to 16,500 years old. The deposits are proglacial, that is, deposits formed as a result of runoff from melting glaciers. These sands and gravels are highly permeable and quickly absorb surface runoff, transporting this water to the ground water in the underlying aquifers. Surface soils, however, become saturated in high precipitation events or are frozen and water then runs over land to nearby swales, and creeks, eventually entering the Lakes.

2.3. Hydrogeology

Ground water in the Barnes area is directly influenced by infiltration and the lakes and rivers and the tributaries that traverse the region. The primary regional hydrogeologic (ground water) divide in this region is the Eau Claire River. The Eau Claire flows northeast to southwest and ground water in the project area is generally considered to be flowing towards the river and the Lakes.

The sensitivity of the ground water contamination by surface activities is a function of the permeability of the surface soils, depth to ground water, depth to underlying bedrock, and the types of overlying soils/sediments. The UW-Extension has mapped this region as highly sensitive to ground water contamination. Because the presence of near surface sandy soils provides a land surface that has a high capacity to infiltrate surface water and dissolved contaminants to the ground water. However, the sandy thicker deposits of unsaturated soils also act as an excellent filter to remove inorganic and organic particulate matter (suspended solids) from the infiltrating surface waters and can be readily adapted to storm water infiltration areas with the addition of finer grained materials.

2.4. Soils

When bedrock and sediments are exposed on the Earth's surface, the rocks and minerals erode and decompose (weather). Over time, soils develop horizons (a vertical differentiation based on observable physical and chemical properties).

- The **O Horizon** is an accumulation of organic material on the soil surface characterized by decomposing plant material with little mineral content.
- The **A Horizon** (or top soil) is an accumulation of organic material, with a loose or open texture, and is leached of dissolved chemicals and fine particles.
- The **E Horizon** is a light-colored layer characterized by leaching of iron and aluminum with a lower organic content.

- The **B Horizon** is the horizon where the material leached from the A and E Horizons tends to accumulate.
- The **C Horizon** is made up of slightly weathered parent material that has not undergone leaching or accumulation.

Depending on the soil forming factors acting on a surface, some of the horizons may be poorly developed or missing; and removing, compacting, and/or mixing soil horizons dramatically alters the soil's ability to sustain vegetation.

Soil descriptions are based on their physical and chemical properties. Soil classification systems are used to group soils of similar properties and to provide a systematic means of mapping. For the purposes of this Management Plan, the soils of the watershed are classified by their hydrologic soil group (HSG). This classification system is based on infiltration rates (water movement into soil) and transmission (water movement through soil) rates. The HSG classification of a soil describes the potential of that soil type to produce runoff. The four hydrologic soil groups as defined by USDA (1955) are:

- **Group A:** Well to excessively drained soils such as sands and gravels. High infiltration rate even when thoroughly wetted. Transmission >0.30 inches per hour.
- **Group B:** Moderately well to well-drained soils such as sandy silty soils. Moderate infiltration rates when thoroughly wetted. Transmission between 0.15 and 0.30 inches per hour.
- **Group C:** Soils with an impeding layer to downward movement such as silty sands and silts. Low infiltration rates when thoroughly wetted. Transmission between 0.05 and 0.15 inches per hour.
- **Group D:** Soils which are almost impervious at or near the surface such as clay. Very low infiltration rates when thoroughly wetted. Transmission between 0 and 0.05 inches per hour.
- **Note:** Soils that do not meet the criteria of Group A, B, C, or D may be saturated and therefore would not have an established rate of infiltration.

Soils in this region are typically mapped as Group A or B soils. Some less permeable soils are present but are typically found in low lying, wet areas.

Soil chemistry in this region has been evaluated by the EPA and others to contain significantly higher concentrations of phosphorous than soils west of the Mississippi. This could be a direct reflection of the high phosphorous content of the decomposing vegetable matter (leaves) on the forest floor over the past 10,000 years.

CHAPTER 3 LAKE WATER QUALITY

An important tool in effective runoff water management is information of existing conditions, problems, and opportunities. This Lake Management Plan identifies local watershed and sub-watershed boundaries; and, natural and manmade drainage and storage features. The Plan describes the existing problems related to drainage, sedimentation, degradation of existing natural resources, and storm water quality. Based on existing and future land use conditions, the Plan proposes effective requirements for existing land uses, new developments, and remediation needs.

Strategies that address the area's unique climate, topography, natural resources, hydrogeology, and land use patterns are necessary. By making use of regulatory, land use planning, and educational approaches whenever feasible, rather than costly structural solutions, the Eau Claire Lakes Watershed can greatly reduce the ultimate costs of implementing a Watershed Management Plan. Public education policy and programs can reduce discharges of nutrients, sediments, old motor oil, household wastes, litter, anti-freeze, deicing chemicals, yard fertilizers, agricultural herbicides, pesticides, and fertilizers. Education of the younger population will encourage the development of habits and practices that will continually improve storm water runoff quality into the future.

Management techniques are similar from one part of the Watershed to another, but are accomplished with different methodologies. In new developments or redevelopment areas, the program emphasizes land use planning approaches using site plan and subdivision review to require specific storm water management actions. In existing rural and developed areas, the use of police and regulatory powers to abate, enjoin, or criminalize illicit discharges and the dumping of pollutants into the storm water system is crucial.

3.1 Lake Ecosystem

Stable ecosystems have great diversity and habitat. Water quality in a lake without wetlands, marshes, near shore shallow areas, or deep open water is more unstable than a lake with this diversity. However, as the years change, season-by-season, the diversity of the ecosystem naturally changes. While land use changes in the watershed, the effects of these changes may not be immediately seen in the lakes. The effects may take years, decades, or more before the negative impacts are realized.

Wisconsin lake shorelines were once natural with lush vegetation. Shoreline dwellings were sparse and considerably less modern than today; oars and manpower controlled boats; and a crowded lake meant seeing another person on the lake. A desire to have a place on a lake of such scenery and serenity soon became the beginning of the recent rush to acquire that refuge over the last 40 years. This rush to acquire that piece of serenity has resulted in many of the concerns discussed in this Lake Watershed Management Plan.

Living organisms around and in lakes require a special balanced habitat that provides food, shelter, oxygen, and other specific needs. "The margin of our water is the place where all life

comes together...a bridge between two worlds. It is a place essential for plants and creatures to survive. As many as 90 percent of the living things in our lakes and rivers are found along their shallow margins and shores.” (Rideau Canal, Parks Canada). The littoral zone provides a nursery for fish, refuge from predators, and it intercepts nutrients.

3.2. Watershed Description

Wisconsin is blessed with the third largest concentration of fresh water glacial lakes on the planet; only Ontario and Alaska have more. About 75 percent of the precipitation that falls to our lakes and land re-enters back into the earth’s atmosphere from evaporation and plant transpiration. On flat land or sandy areas, water infiltrates to the ground water and moves toward lakes and rivers and excess water runs off the land and enters the lakes and rivers. Lake levels fluctuate season-to-season in response to rainfall events, outside temperature, dams, etc. Such fluctuations are characteristic of normal lake systems. Of Wisconsin’s 15,081 lakes, it is easy to see the lure of the Barnes area lakes. The seclusion, fishery, and the sandy beach like shorelines are a few of the qualities that draw people to the area.

Lake types are dependant upon the water source and types of outflow for the individual water body.

- A. A lake fed by precipitation, with limited runoff and ground water, and has no stream outlet is called a seepage lake.
- B. A lake fed by ground water, with limited precipitation and runoff, and has a stream outlet is called a ground water drainage lake.
- C. A lake fed by precipitation, ground water, runoff, and is drained by a stream outlet is called a drainage lake.
- D. A manmade lake created by damming a stream, which still allows it to drain, is called an impoundment.

Upper, Middle, and Lower Eau Claire Lakes are classified as drainage lakes. An impoundment is present at the outlet of Lower Eau Claire Lake that discharges into the Eau Claire River.

Sub-Watershed	Acres
A - Upper	6,053
B - Middle	3,299
C - Lower	2,713

The Eau Claire Lakes Watershed that is directly contributing to the Lakes is calculated to be 12,065 acres in size with 3 primary sub watersheds as identified in Table 3-1. These acreages include the lake surface areas.

Table 3-2 lists the lakes within the sub-watershed study area and the surface area of each of those lakes:

Lake Name	Acres (Surface Area)
Lower Eau Claire	802
Middle Eau Claire	902
Upper Eau Claire	996
Cranberry	131
Bony	191
Birch	129
Robinson	91
Shunenburg	44
Smith	31
Swett	88
Un-named	25

The Lower, Middle and Upper Eau Claire Lakes make up about 79% of the lake surface water within the lakes watershed.

Runoff rates from natural landscapes are dependent on the slope of the topography, the absorption capacity of the soil and the evaporative uptake of lush vegetation. If best management practices are not in place, soil, water, nutrients, and other debris are collected by overland stormwater flow and carried to the lakes. The primary pollutant associated with forestry, agricultural, and development activities is eroding soil. The secondary pollutants are nutrients, the increase of which in the lakes increases the viability of plant and algae life.

3.3. Oxygen Cycle

A healthy dissolved oxygen level for fish and plants is typically in the range of 7 to 11 mg/L (milligrams per liter). Dissolved oxygen (DO) refers to oxygen gas that is dissolved in water. Fish “breathe” oxygen just as land animals do. However, fish are able to absorb oxygen directly from the water into their bloodstream using gills, whereas land animals use lungs to absorb oxygen from the atmosphere. There are three main sources of oxygen in the aquatic environment: 1) direct diffusion from the atmosphere; 2) wind and wave action; and 3) photosynthesis. Of these, photosynthesis by aquatic plants and phytoplankton is the most important. Figures 3-1 through 3-11 graphically depict the dissolved oxygen and temperatures verses depth for Upper, Middle and Lower Eau Claire Lakes from 2002-2005.

Oxygen, derived from photosynthesis, is produced during the day when sunlight shines on the plants in the water. Oxygen levels drop at night because of respiration by plants and animals, including fish, and photosynthesis is not replenishing the oxygen level. These predictable changes in DO that occur every 24 hours are called the diurnal oxygen cycle.

In the fall, stratified lakes “turn over”, mixing the lower and less oxygenated waters of the lake with the near surface higher oxygen content waters. With the onset of winter, lake water oxygen content will decline as decomposition of decaying plant life continues to absorb oxygen. If the ice is too thick and the decomposition rate is high, low DO levels can result in a high fish mortality.

3.3.a. Mixing

Mixing of water in the lakes by wave action increases dissolved oxygen concentrations. The depth, size, and shape of the lake controls the ability for water to mix which also controls the mixing of the nutrients. In the summer, wind action readily mixes those

topographically unprotected shallow lakes. The Eau Claire Lakes have large surface areas, thus mixing in also an important contributor to dissolved oxygen levels.

3.3.b. Stratification

Summer stratification in deeper lakes usually forms three layers. The warm surface layer is called the epilimnion, and oxygen is mixed from the atmosphere in this layer. The transition zone between warm surface water and cold, deep water is called the thermocline, or metalimnion. The cold bottom water is called the hypolimnion. Deeper lakes that do not mix usually have low oxygen levels in the hypolimnion as a result of decomposition of decaying matter. As the oxygen becomes used up, this layer tends to trap and concentrate nutrients dissolved from bottom sediments by anaerobic processes. These are deep lakes with well defined stratification.

3.3.c. Retention Time

A lake's size, water source, and watershed size determine the average length of time water remains in a lake, or the retention time. Another way to look at this would be to see how long it would take to fill a drained lake. The retention time for the Eau Claire Lakes has yet to be calculated. However, considering the surface area, and depth of the lakes, and the outlet size and depth, one can readily conceive that the retention time is quite long (years or perhaps decades) in these lakes. This means that suspended solids and nutrients will be retained in the lake, over longer periods, increasing the pollutant concentrations as additional nutrients and solids enter the lake.

3.4. Lake Water Quality

Lake water quality is almost synonymous with lake water clarity. The principal loading factors that results in decreased clarity are suspended solids and nutrients; increasing both factors decreases water clarity and water quality. Water quality is, however, a multi-faceted parameter consisting of the inter-relationships of water clarity, nutrient and sediment contributions from watershed sources, and water chemistry (pH, hardness, and alkalinity). The following briefly describes the role and importance of these factors in water quality.

3.4.a. Water Clarity

Two components determine water quality: materials dissolved in water and materials suspended in water (turbidity). Water quality can be relatively measured as water clarity. This measurement has been standardized (Table 3-3) with the use of a measuring device known as a Secchi disc. The standardized measurements are an indicator or measure of water clarity and can be compared to other chemical and physical properties of the lake and other lakes.

A Secchi disc is an 8-inch diameter weighted, flat circular disc with four alternating black and white quadrants that can be lowered into a lake to visually measure water clarity. The depth at which the Secchi disc disappears can be related to the quantity of nutrients and type of algae present in the water column. Interpretation is relatively simple: the higher the readings, the clearer the lake. Cloud cover, sun's angle, and wave, action affect this reading, so it is recommended these measurements be performed on calm, sunny days between 10:00 a.m. and 2:00 p.m.

3.4. b. Nutrients

Runoff that contains high concentrations of phosphorus and nitrogen can lead to increased plant growth and algae blooms in the receiving waters. River impoundments have the greatest risk of increased rates of eutrophication as they have substantiated water input from upstream sources. In our region, phosphorus is typically the main nutrient controlling plant growth and algae blooms in water systems as nitrogen is typically available. Thus with only small concentrations of phosphorous, algae blooms are prevalent.

3.4.c. Trophic Status

Section 305b of the Clean Water Act requires each state to construct "fishable" and "swimmable" goals. Federal requirements in Section 314 of the Clean Water Act require all lakes of the nation be classified using a single criteria. Scientists have established criteria to evaluate the nutrient state of the lakes, since each is unique and at different levels of eutrophication.

Eutrophication is referred to as the process by which lakes are enriched with nutrients, accumulated sediments, productive aquatic plants, and algae. Table 3-4 below designates the TSI value/ranges and descriptions of the trophic state of the water and example lakes.

Water Clarity	Secchi Depth (ft)
Excellent	32
Very good	20
Good	10
Fair	7
Poor	5
Very Poor	3

Modified from: Understanding Lake Data, Table 2, WDNR

Table 3-4: Trophic State Index (TSI)		
TSI Value	Water Quality Attributes	Fisheries, Recreation or Example Lakes
<30	Oligotrophic: Clear water, oxygen through the year in the hypolimnion. Water supply may be suitable unfiltered.	Salmonid fisheries dominate.
30-40	Hypolimnia of shallower lakes may become anoxic during the summer.	Salmonid fisheries in deep lakes only. Example: Lake Superior (WDNR)
40-50	Mesotrophic: Water moderately clear but increasing probability of anoxia in hypolimnion during summer. Possible iron, manganese, taste and odor problems may worsen in water supply. Water turbidity requires filtration.	Walleye may predominate and hypolimnetic anoxia results in loss of salmonoids.
50-60	Eutrophic: Lower boundary of classic eutrophy. Decreased transparency, anoxic hypolimnion during the summer, macrophyte problems evident, warm water fisheries dominant.	Bass may dominate.
60-70	Dominance of blue-green algae, algal scums probable, extensive macrophyte problems. Possible episodes of severe taste and odor from water supply. Anoxic hypolimnion, water-water fisheries.	Nuisance macrophytes, algal scums and low transparency may discourage swimming and boating.
70-80	Hypereutrophic: Light limited productivity, dense algal blooms and macrophyte beds.	Lake Menomin & Tainter Lake, Dunn County, WI (WDNR).
>80	Algal scums, few macrophytes, summer fishery kills.	Dominant rough fish.

At present there are many opinions being presented that would alter the correlation between TSI and water quality. In this text, the table above, as presented by the WDNR, is used to describe the Trophic State of the Eau Claire Lakes which are considered mesotrophic with TSI values of 40 to 50.

3.5. Carbonate System

Biological productivity, lake acid buffering capacity, and solubility of toxic chemicals are affected by a lake's carbonate system. Many naturally occurring chemicals of this system constantly change with sunlight, temperature, each wave, and different biological activity.

3.5.a. Lake pH

An important aspect of the carbonate system is the acidity of pH of the lake. The pH indicates the amount of available hydrogen ions (H⁺) in water. The more acid (pH less than 7) the water, the more hydrogen ions are present. Basic or alkaline water has less hydrogen ions (pH greater than 7). Neutral water has a pH of 7.

The pH in Wisconsin lakes ranges from 4.5 in reducing lakes to 8.4 in hard water lakes. Rainfall also varies in pH from 4.4 in southeast Wisconsin to 5.0 in northern Wisconsin (WDNR). These ranges are deceiving, as acid levels change 10 times for every pH unit. Therefore, a lake with a pH of 7 is 10 times more acidic than a lake with a pH of 8 because there are 10 times as many hydrogen ions.

Water pH	Resulting Effect
3.0	Toxic to all fish
3.5	Perch disappear
4.5	Perch spawning inhibited
4.7	Brown bullhead, northern pike, pumpkinseed, rock bass, sunfish and white sucker disappear
5.0	Spawning inhibited in many fish
5.2	Burbot, lake trout, & walleye disappear
5.5	Smallmouth bass disappear
5.8	Lake trout spawning inhibited
6.5	Walleye spawning inhibited

Source: Olszyk 1980

Most fish thrive in water within a range of 5 to 9 pH values. Moderately low pH doesn't usually harm fish, however, with lower pH concentrations; metals (aluminum, iron, mercury and zinc) become soluble and are released from the lake bottom sediments. Lakes that contain more acidic waters usually have tainted fish due to high levels of mercury or aluminum. When eagles, loons, osprey, or humans eat tainted fish, the metals accumulate in their bodies and can threaten their health. The relative affects of lake water acidity on fish species are given in Table 3-5. Note the sensitivity of the walleye fishery to a pH of 6.5 or less.

3.5.b. Alkalinity and Hardness

Alkalinity and hardness of lake water is affected by the quantities of impurities that dissolve or come in contact with lake water, soil minerals, and bedrock. Bicarbonate and carbonate are two alkaline compounds that act as acid buffers and are usually found combined with calcium (calcium carbonate: calcite or limestone) and magnesium (calcium magnesium carbonate: dolomite).

Much of northern Wisconsin contains glacial deposits that contain very little to no limestone. Therefore, these soils that have a higher sand content tend to have lower alkalinity and hardness values. However, if a lake receives groundwater through limestone bedrock, the water will have higher alkalinity and hardness. More fish and aquatic plants are produced in hard water lakes than soft water lakes.

Table 3-6 Hardness Categorization	
Total Hardness (mg/L CaCO₃)	Hardness Level
0-60	Soft
60-120	Moderately Hard
120-180	Hardness Level
> 180	Very Hard

3.6. Eau Claire Lakes Water Quality

Lake water quality data (Secchi Depth, phosphorous concentration, temperature, and chlorophyll 'a' data) has been collected on the Eau Claire Lakes chain for over 20 years. This data has been collected as part of the Association's Self-Help Monitoring program and the WDNR Basin Management projects. The data is available on the Internet through the DNR Stret Lake Water Quality database.

The compiled data is included in Tables 3-7, 3-8, 3-9, 3-10, 3-11, and 3-12. Tables 3-7, 3-8, and 3-9 present the dissolved oxygen concentration and temperature data for the Lower, Middle and Upper Eau Claire Lakes, respectively. Tables 3-10, 3-11, and 3-12 provide the phosphorous, Secchi Depth, and chlorophyll 'a' data for each of Lower, Middle, and Upper Eau Claire Lakes, respectively. For convenience of comparison, these data tables include TSI (Trophic State Indicator) calculations. Table 3-3 presented the scale for TSI water quality which is summarized below:

<30	Oligotrophic
30 to 40	Increasing anoxia
40 to 50	Mesotrophic
50 to 70	Eutrophic
70 plus	Hypereutrophic

A review of Tables 3-10, 3-11, and 3-12 indicates TSI values ranging from 33 for Secchi Depth in Upper Eau Claire Lake to 54 for surface water concentrations of phosphorous in Lower Eau Claire Lake. Average values for each lake are in the upper oligotrophic to mesotrophic range (30 to 50 units).

Presenting graphs of dissolved oxygen and temperature versus depth can be used to define the water layering or stratification discussed previously. Figures 3-1, 3-2, and 3-3 present the profiles for Lower Eau Claire Lake for the years 2003, 2004, and 2005, respectively. Figures 3-4, 3-5, 3-6, and 3-7 present the profiles for Middle Eau Claire Lake in the years 2002, 2003, 2004, and 2005, respectively. And Figures 3-8, 3-9, 3-10, and 3-11 present the Upper Eau Claire Lake profiles for the years 2002, 2003, 2004, and 2005, respectively. Each figure represents a

single year per lake with the profiles presented chronologically from top to bottom. Each figure presents multiple profiles representing spring, summer, and fall measurements.

In almost all figures, the early season measurements present a linear trend of DO and temperatures with increasing depth. The profiles of the measurements in the summer months reveal the development of stratification with a colder, anoxic layer at depth in June, July, and August. With the late summer/early fall turnover, one observes a return to a well mixed condition with similar temperatures with increasing depth and moderate (approximately 7 mg/L) dissolved oxygen concentrations as evidenced by the linear trends of DO and temperature with increasing depth.

It is during the low oxygen, low temperature periods that phosphorous, chemically bonded to lake sediments, is released into the lake water by anaerobic biological activity in the bottom detritus. These effects are readily observed in the magnitude of the Bottom Total Phosphorous concentrations presented in Tables 3-11 and 3-13. These samples were collected between 1987 and 1997 in Upper and Lower Eau Claire Lakes. Spring samples collected from surface and bottom show a slight increase from surface to bottom water quality. This difference increases significantly by July and August. This increase is coincident with the development of the water stratification observed in Figures 3-1, 3-2, and 3-3. Although similar surface/bottom phosphorous data was not collected for Middle Eau Claire Lakes, the presence of stratification of this lake as noted in Figures 3-4, 3-5, and 3-6 is indicative that the conditions are present to foster this organic activity.

CHAPTER 4: LAND USES AND WATERSHED IMPACTS

4.1. General

A watershed is a land surface in which the overland runoff can be traced to a predicted outlet; thus, the entire area of one watershed drains to one location in that watershed. The Eau Claire Lakes Watershed (12,037 acres) has been divided into sub-watersheds, three of which (8,548 acres) drain directly to the Eau Claire Lakes. The area is comprised of many sub-watersheds; most of which ultimately outlet to ground water and/or the Eau Claire Lakes. The surface waters in this watershed comprise 3,488 acres of the watershed.

The land use in the Eau Claire Lakes Watersheds is primarily forest and rural residential with the balance in recreational, single- and multiple-family residential and commercial activities. There are few industrial sites. Each type of land use has different impacts on its portion of the watershed. Highly developed multi-residential, commercial, and industrial areas have a larger percentage of impervious surfaces which create a greater quantity of high velocity runoff than properties that are less developed. To a lesser degree but also with the ability to impact lake water quality are residential areas which have a percentage of impervious areas and lower rates of runoff water pollutants. These areas have been considered by many to have a low impact on water quality. Relative to urban centers yes, but consider that the majority of this development is on the shoreline, directly adjacent to the waters you come to enjoy. Undeveloped woodland forests and grass lands create even less runoff than the developed areas due to greater infiltration and transpiration.

4.2. Statement of Problems

Runoff rates from natural landscapes such as wetlands, prairies, and woodlands are quite low due to the absorptive capacity of the soil and the evaporative uptake of lush vegetation. When surface runoff does occur, it is often temporarily stored in adjacent depressions and wetlands. During very wet periods, overland flow drains the landscape via small swales, ditches, and streams, eventually reaching large rivers and lakes.

Historically, many natural storage areas, swales, drainage ways, and wetlands have been completely eliminated by forestry, agricultural, and development practices. The net effect is increased downstream water volume, forcing more water into existing natural and constructed conveyance systems and floodplains. The effect of uncontrolled forestry, agricultural, and development practices is a substantial increase in the magnitude and duration of flooding and resultant flood damages. The 1920s and 1930s offer many poignant examples. Increased runoff rates also promote the destabilization of downstream channels, causing stream bank erosion and increased water quality pollutant load discharges.

Forestry and agricultural runoff is typically contaminated with sediment, phosphorus, bacteria, and nutrients. Residential and urban runoff, especially from streets and parking lots, is contaminated with sediment, heavy metals, bacteria, nutrients, and petroleum byproducts. During construction, erosion from uncontrolled development sites contributes much larger

quantities of sediment and pollutant discharges to storm water runoff. Storm water runoff pollutants degrade receiving rivers, lakes, streams, and creeks by killing sensitive aquatic life, encouraging the growth of non-native invasive vegetation, impairing aesthetic conditions, and making water recreation undesirable.

Daily drainage and water quality discharge problems are often highly visible and the public concerns ensure that these problems receive immediate attention. Long-term drainage and water quality discharge problems, on the other hand, often go unnoticed. The problems tend to intensify over a long period of time, and appear suddenly as a flood or recognized deterioration of water quality.

4.3. Land Use

The area is known as the cutover area. Early development of the region was dominated by logging. By the mid 1860's this area had little left in forest and was ravaged by forest fires and later floods that washed the nutrient rich surface soils into the stream waters and the lakes. Development then came slowly as the residual sandy soils were determined to be too poor for farming.

The Eau Claire Chain is at the headwaters of the Eau Claire River which today are recognized as outstanding resource waters. These clear lakes are connected by streams with the Middle and Lower Lakes connected through a navigable channel controlled by a mechanical small boat lock. The clarity of the lakes has been the principal reason for the residential development in this region. In addition, there are some commercial activities, but few industrial or principal urban areas present.

To evaluate the impacts of development, two planning periods were chosen to assess land use and related storm water runoff impacts. Land use characteristics were projected for both planning periods. The planning periods used correspond to Wiscland, 1993, for present land use (Figure 4-1) and the zoning map for the Town of Barnes for future (2020) projected land use. The land use area and percentages for Current and Future Land Use are presented in Table 4-1.

4.3.a. Delineated Current Land Use (1993)

Existing land use conditions utilized in the preparation of the Eau Claire Lakes Watershed Management Plan water quantity and water quality modeling analyses are based on Wiscland (1993). Figure 4-1 shows the Current Land Use for the watershed planning area.

4.3.b. Delineated Future Land Use (2020)

Proposed future land use conditions utilized for the preparation of the Eau Claire Lakes Watershed Management Master Plan water quantity and water quality modeling analyses were based on Town of Barnes Land Use Plan and Zoning Map and available information from Bayfield County.

Town of Barnes, Bayfield County, WI and
Barnes-Eau Claire Lakes Property Owners Association

Eau Claire Lakes:

Lake Management Plan

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Table 4-1 CURRENT Land Use Breakdown By Watershed				FUTURE Land Use Breakdown By Watershed			
Watershed	Land Use	Acreage	Percentage	Watershed	Land Use	Acreage	Percentage
A	Commercial	22.20	0.48%	A	Commercial	22.20	0.48%
A	Forestland	3,881.45	84.70%	A	Forestland	3,380.00	73.76%
A	Grassland	82.21	1.79%	A	Grassland	82.21	1.79%
A	Institutional	6.83	0.15%	A	Institutional	6.83	0.15%
A	Parks	0.06	0.00%	A	Parks	0.06	0.00%
A	Rural Residential	316.46	6.91%	A	Rural Residential	452.26	9.87%
A	Single Family	206.07	4.50%	A	Single Family	571.72	12.48%
A	Wetlands	67.33	1.47%	A	Wetlands	67.33	1.47%
	Total	4,582.61	100.00%		Total	4,582.61	100.00%
Watershed	Land Use	Acreage	Percentage	Watershed	Land Use	Acreage	Percentage
B	Commercial	90.11	4.04%	B	Commercial	90.11	4.04%
B	Forestland	1,434.99	64.42%	B	Forestland	1,288.71	57.85%
B	Grassland	10.68	0.48%	B	Grassland	10.68	0.48%
B	Institutional	33.20	1.49%	B	Institutional	33.20	1.49%
B	Parks	19.51	0.88%	B	Parks	19.51	0.88%
B	Rural Residential	329.39	14.79%	B	Rural Residential	391.37	17.57%
B	Single Family	226.46	10.17%	B	Single Family	310.77	13.95%
B	Wetlands	83.36	3.74%	B	Wetlands	83.36	3.74%
	Total	2,227.69	100.00%		Total	2,227.69	100.00%
Watershed	Land Use	Acreage	Percentage	Watershed	Land Use	Acreage	Percentage
C	Commercial	44.82	2.48%	C	Commercial	44.82	2.48%
C	Forestland	1,335.02	73.80%	C	Forestland	1,313.12	72.59%
C	Golf Course	101.85	5.63%	C	Golf Course	101.85	5.63%
C	Grassland	26.40	1.46%	C	Grassland	26.40	1.46%
C	Institutional	0.52	0.03%	C	Institutional	0.52	0.03%
C	Rural Residential	55.40	3.06%	C	Rural Residential	57.57	3.18%
C	Single Family	179.80	9.94%	C	Single Family	199.53	11.03%
C	Wetlands	65.14	3.60%	C	Wetlands	65.14	3.60%
	Total	1,808.94	100.00%		Total	1,808.94	100.00%

4.3.c. Future Growth

The most significant findings of the land use study are:

- Current land use shows the watershed is comprised of over 6600 acres of forest.
- The principal development in the watershed is currently as single-family/rural residential.
- Future land use indicates that only 10% of the forest lands will be developed in the next 2 decades.
- Future land use is anticipated to be almost all rural residential/single family homes.

4.4 Discussion

Using land use alone, one would consider that there is little need for development controls. However, one must consider that historic use of the region has resulted in increasing the rate of lake aging (eutrophication) by the concentration of nutrient rich soils in the lakes during and after the logging era. Continued development in the watersheds, particularly adjacent to the lakes will increase the impact of development on the lakes. And continued uncontrolled surface water runoff from the existing developed areas will continue to contribute to water quality degradation.

CHAPTER 5: WATERSHED WATER MODELING

5.1 Storm Water Runoff Quantity

To provide a useful water quality planning document, an analysis using a computer model of the existing watershed system and existing conditions, and a model of the proposed future development must be conducted. The system analysis is a technical analysis of water quantity at given rates of precipitation and incorporating computer modeling of the land use, storm water runoff, storm water conveyance systems, overland drainage, wetlands, lakes, ponds, streams, channels, and water quality, and drainage ways. The analysis is accomplished using standard hydrologic and hydraulic modeling methodologies for storm water runoff quantity that includes components such as pipe flow, overland flow, drainage ways, and pond storage of storm water.

To calculate the runoff quantity, both manmade and natural features are considered. Land use, soils, overland drainage, and topography are modeled in the HydroCAD Storm Water Modeling System (v7.1) to develop runoff quantity. HydroCAD is a computer aided design program designed to model the hydrology and hydraulics of storm water runoff. It is based on hydrological techniques (namely TR-20) developed by the Soil Conservation Service (now known as the Natural Resource Conservation Service). It facilitates creation of a working model of an entire drainage system by combining the hydrological analysis results with standard engineering hydraulic calculations.

The procedure for calculating the storm water runoff quantity is as follows:

1. Delineate the overall lake watershed.
2. Delineate sub watersheds for each lake that drains directly into the lake.
3. Identify existing and future land use within the watershed.
4. Identify the soils in the watershed.
5. Calculate existing and future Curve Numbers based on land use and soils.
6. Enter data into the Hydrocad model and calibrate the model.
7. Run the model for the 2-, 10-, and 100-year rainfall events for existing and future land use conditions.

The Curve Number is a measure of the amount of runoff that is generated from a given surface. Curve Numbers are mathematical representations of the hydrologic soil group, land use, hydrologic condition, and antecedent runoff conditions and are calculated for use in computer models to calculate the quantity of water runoff. Soils in this project area are considered A and B soils, thus having low runoff potential. Table 5-1 shows the typical relationship between Curve

Table 5-1: Typical Runoff Coefficients				
Description	SCS Curve Number			
	HSG A	HSG B	HSG C	HSG D
Commercial	89	92	94	95
Industrial	81	88	91	93
Single Family	61	75	83	87
Multiple Family	77	85	90	92
Agriculture	64	75	82	85
Conservancy/Grassland	49	69	79	84
Woods	36	60	79	79
Open Water	100	100	100	100

Numbers, Land Use, and the Hydrologic Soil Groups. The higher the number, the greater the runoff quantity during a given storm event. As land use changes, then the Curve Number will also change to be representative of the level of development achieved in a particular area in the given time. Areas with higher Curve Numbers are anticipated to have greater runoff and require more aggressive solutions to mitigate the impacts on the water quality.

The existing runoff CN and coefficient throughout undeveloped areas is less than what it will be when the anticipated level of development and urbanization is reached in the future. The values of the CN and runoff coefficient increase as the area of impervious surfaces increase.

5.1.a. Watersheds

Three sub-watersheds (labeled A-C as shown in Figure 5-1) delineated the area directly impacting the Eau Claire Lakes. Hydrologic effects are influenced by tributary drainage areas, watershed shape, land use, soils, existing impoundment areas, and a variety of other factors. Delineation of sub-watershed areas that do not directly affect the Lakes is critical to the modeling of this watershed. As seen in Figure 5-1, there are many areas in the Watershed that do not have positive surface drainage to the Lakes, thus the contribution from these areas to the Lakes is not considered in the surface runoff calculations.

The watershed delineation is based on a USGS topographic map with 10 foot contours. For modeling, the 10 foot contours were interpolated to a 2 foot contour interval. This means that existing smaller features in the landscape are not refined, and the modeling then is based on assumed contours and must be considered to provide generalized results.

5.1.b. Land Use

The land uses as defined in Chapter 4 are input into the water quantity models.

Although the future land use map for the Town of Barnes was used as a starting point, the information was modified to fit the criteria for a more accurate land cover analysis. Some areas that had one house on large tracts of forested land (greater than five acres) were still considered forested because the water runoff of these areas will more consistent to that of forestland than that of residential land.

Aside from land use, it is important to consider the housing density throughout the watershed, and more specifically along the lake shore. Higher density areas have more concentrated runoff that has an increased capacity to carry more nutrients and sediments into the lake. Figure 3.9 shows the number of housing units per acre within the entire watershed. It is evident (as one would assume) that the highest density occurs along the lake shore (the north edge of both Middle and Upper Eau Claire Lakes have the highest density).

5.1.c. Soils

In order to estimate the Curve Number (CN) in the subwatersheds, each observed soil type must be characterized to define its Hydrologic Soil Group (HSG) (Figure 5-2). The HSG distribution for soils in the Eau Claire Lakes watersheds is summarized in Table 5.2. The Eau Claire Lakes watersheds are dominated by sandy soils with high infiltration rates, which reduce the amount of pollutants transported to the lakes.

Lakes	HSG A [%]	HSG B [%]	HSG C [%]	HSG D [%]
Upper Eau Claire Lake	70.6	19.4	0.0	10.0
Middle Eau Claire Lake	80.6	18.3	0.0	6.2
Lower Eau Claire Lake	56.7	35.5	.5	7.3

Table 5-2: HSG distribution for soils in the Eau Claire Lakes watershed.

Two HydroCAD models were completed: One for existing land use conditions and one for future land use conditions. The results from the stormwater quantity results are presented as HydroCAD printout sheets in Appendix A. Examples of information included on these sheets are: Watershed area [acres], runoff [cubic feet per second], runoff volume [acre-feet (equals 325,851 gallons)] and pond-, reach-, and outlet particulars.

The results of the modeling are summarized in Table 5-3. The modeling results indicate some increase in watershed runoff from current to future development. This is to be expected as the predicted land use increase is of moderate impact (residential). The most significant impacts will be on Upper and Middle Eau Claire Lakes. It should be noted that this development will be

centered near the lake shore as second or third tier development, thus although limited in scope, uncontrolled development will have significant impact on the lakes.

The impact of this data is not always clear to those in the watershed. Suffice it to say that the sandy soils and low development pressure in this region have reduced the impacts on local surface water quality when compared to other more populated areas in Wisconsin. However, the high permeability of the soils suggests ground water impacts on local surface waters may be more significant than in areas characterized by impervious soils.

Table 5-3. HYDROCAD MODELING RESULTS					
RUNOFF IN ACRE FEET (1 AF = 43560 CF = 325851.4 GALLONS per ACRE)					
LAND USE	EXISTING		FUTURE		CHANGE IN RUNOFF (AF)
PERVIOUS AREA	8619 AC		8619 AC		
IMPERVIOUS AREA (LAKES)	3446 AC		3446 AC		
STORM TYPE: 24 HR 2 yr RAINFALL 2.60"					
WATERSHED	EXISTING CN	RUNOFF - AF	FUTURE CN	RUNOFF - AF	
A - 4583 ac	39	0	41	0	0
LAKE INFLOW	99	304.118	99	304.118	0.32
OUTFLOW TO B		156.604		156.604	0
B - 1809 ac	44	0.043	45	0.363	0.301
LAKE INFLOW	99	221.778	99	221.778	0
OUTFLOW TO C		291.54		291.841	0
C - 2227 ac	42	0	42	0	0.221
LAKE INFLOW	99	187.022	99	187.022	0.32
OUTFLOW DOWNSTREAM		292.761		292.982	0
RUNOFF VOLUME		712.961		713.281	0.32
AVE RUNOFF DEPTH	0.71 INCHES		0.71 INCHES		
STORM TYPE: 24 HR 10 yr RAINFALL 3.90"					
WATERSHED	EXISTING CN	RUNOFF - AF	FUTURE CN	RUNOFF - AF	
A - 4583 ac	39	13.861	41	25.88	12.019
LAKE INFLOW	99	463.215	99	463.215	0
OUTFLOW TO B		276.678		285.137	8.459
B - 1809 ac	44	24.181	45	28.746	4.565
LAKE INFLOW	99	337.801	99	337.801	0
OUTFLOW TO C		521.293		532.431	11.138
C - 2227 ac	42	13.063	42	13.063	0
LAKE INFLOW	99	284.862	99	284.862	0
OUTFLOW DOWNSTREAM		558.209		566.068	7.859
RUNOFF VOLUME		1136.982		1153.567	16.585
AVE RUNOFF DEPTH	1.13 INCHES		1.15 INCHES		
STORM TYPE: 24 HR 100 yr RAINFALL 5.40"					
WATERSHED	EXISTING CN	RUNOFF - AF	FUTURE CN	RUNOFF - AF	
A - 4583 ac	39	110.038	41	143.629	33.591
LAKE INFLOW	99	646.88	99	646.88	0
OUTFLOW TO B		487.8		513.913	26.113
B - 1809 ac	44	97.05	45	106.809	9.759
LAKE INFLOW	99	471.738	99	471.738	0
OUTFLOW TO C		900.25		932.059	31.809
C - 2227 ac	42	63.787	42	63.787	0
LAKE INFLOW	99	397.809	99	397.809	0
OUTFLOW DOWNSTREAM		1007.214		1031.4	24.186
RUNOFF VOLUME		1787.302		1830.652	43.35
AVE RUNOFF DEPTH	1.78 INCHES		1.82 INCHES		

5.2 Runoff Water Quality

Water quality modeling for this lake management plan is being completed to identify the annual contribution of nutrients and sediments to the lakes. It should be apparent that the larger watersheds will contribute greater loading if all other parameters are similar. We do not attempt to model the distribution of nutrients in the lake system itself. Additional, more involved studies of the nutrient and water balance are necessary to understand this aspect of the system.

Modeling the quality of runoff water is completed using a combination of techniques. This rural area with little presence of agriculture and urban development and with a low forecast for such development requires less sophisticated modeling tools than more complexly developed areas.

To calculate the runoff water pollutant loads generated in the Eau Claire Lakes watershed, two different methods were used:

Method 1: Compare the Eau Claire Lakes watershed to similar watersheds where water quality data already exists.

Method 2: Use the WiLMS software to calculate phosphorus loads to the Eau Claire Lakes from the surrounding watersheds.

5.2.a. Method 1:

Water quality research has occurred in many watersheds. The Eau Claire Lakes watershed was compared to such watersheds to identify the most similar watershed available. Results from research at Butternut Creek (Butternut Lake), Ashland/Price County [1] were used to estimate phosphorus and nitrogen loads from the watershed to the Lakes. Similarly, research from Little Balsam Creek, near Patzau, Douglas County [2] was used to estimate the sediment loads to the Lakes. Similar land use and soil types are the most important factor when deciding which basic watershed to use as a model for these calculations.

The research presents export coefficients (in terms of mass of pollutant per area per year) for the researched watersheds. These export coefficients were applied to the area of the Eau Claire Lakes watershed to estimate the annual pollutant load to each lake. The results from Method 1 are presented in Table 5.4.

Lake	Total Phosphorus [lb/yr]	Total Nitrogen [lb/yr]	Total Suspended Solids [lb/yr]
Upper Eau Claire	510	14,300	1,045,500
Middle Eau Claire	250	6,900	508,300
Lower Eau Claire	200	5,600	412,700

Table 5-4: Water quality results from Method 1.

5.2. b Method 2:

WiLMS (Wisconsin Lake Modeling Suite), a lake water quality-planning tool developed by WDNR, was also used to calculate the phosphorus load to the Lake. The model uses an annual time step to predict the average total phosphorus loading to the watershed discharge point (in this case, the Eau Claire Lakes). It is the latter output that we are interested in for this phase of the computer modeling.

The model is suitable in rural settings as opposed to other programs such as P8 and WinSLAMM. Lake particulars, land use information, and WiLMS export coefficients are incorporated to calculate the phosphorus load to each Lake. Figure 5-2 illustrates the annual phosphorus loading from different land uses.

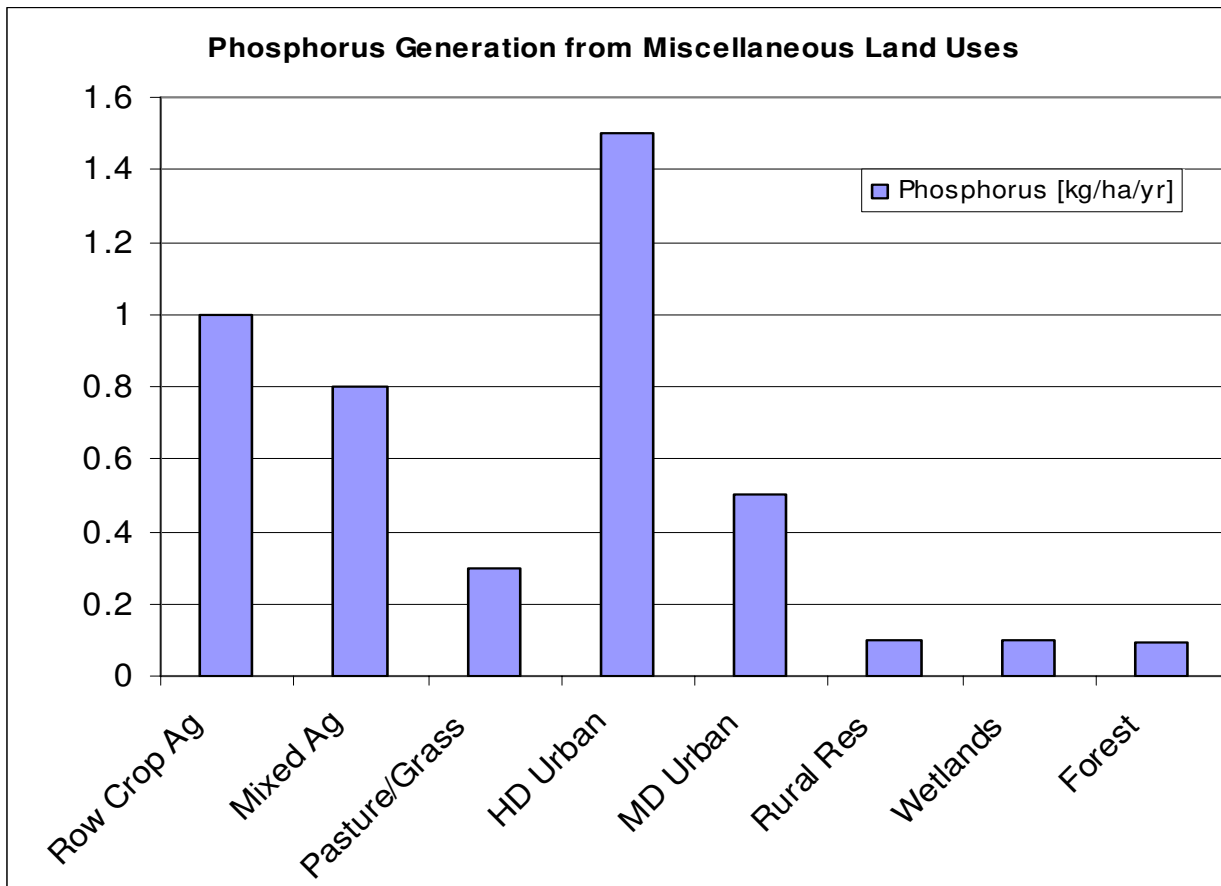


Figure 5-2: Phosphorus generation from miscellaneous land uses.

Attempting to address each lake subwatershed individually resulted in skewed results. Thus, we modeled the three subwatersheds as one, with the lake surface areas representative of all lakes in the watersheds. The land uses presented in Table 4-1

Current were used in the modeling. The results are presented in Table 5-5, and the WiLMS data sheets are included in Appendix B.

The model input data used the existing default data sets for precipitation for Bayfield County and the default export coefficients for specific land uses in the WiLMS model.

There are no point sources modeled in this watershed and by modeling all the lakes, we eliminate concerns about the nutrient mass transfer from one lake to the next, although it is tempting to do so, it is beyond the scope of this current project.

To estimate the contribution of septic systems, estimated numbers for septic systems, permanent residents, and seasonal residents were employed. A recent counting of the number of residences have been completed for all the lakes in the watershed was completed by the Lake Association volunteers. The survey, completed over 2004 and 2005, identified some 689 lake property owners. The recent sociological survey for the Lake was sent out to over 750 addresses in the Lakes' watersheds. Using this information as a starting point, the following assumptions on septic system use are made.

- Assumption 1: 700 residences on the lakes
 - Assumption 2: 200 permanent residences
500 seasonal residences
 - Assumption 3: 2 persons per permanent residence (most are retired)
 - Assumption 4: 4 persons per seasonal residence. Seasonal residents spend 0.4 years on site.
- Septic System Per Capita Usage: $2 \times 200 + 4 \times 0.4 \times 500 = 1200$ septic units
- Assumption 5: The Phosphorous Retention factors were reduced by a factor of 10 due to the coarse sandy soils and presence of older septic systems.
 - Assumption 6: Future NPS loading is estimated at 50% through future BMP implementation.

Table 5.5 presents the “most likely” phosphorous loading for the Eau Claire Lakes.

Source	Current	Future
Nonpoint – Human Impact	179 kg	90 kg
Nonpoint – Natural	38 kg	19 kg
Lake Surface	372 kg	372 kg
Septic Tanks	60 kg	60 kg
Total	649 kg	541 kg

Table 5.5 WiLMS Water Quality Model Results

5.2.c. Conclusions

As WiLMS is assumed to provide a more accurate phosphorus loading estimate than Method 1, and since the actual land use in the Eau Claire Lakes watershed is used in the WiLMS calculation, then the WiLMS phosphorus loading estimate should be used as a future reference in the Eau Claire Lakes planning process. Table 5-6 presents the final results for annual pollutant loading to the Lakes. Note that the Total Phosphorous Loading reported here DOES NOT include the Lake Surface Precipitation of Phosphorous.

Lake	Total Phosphorus [lb/yr]	Total Nitrogen [lb/yr]	Total Suspended Solids [lb/yr]
Upper Eau Claire		14,300	1,045,500
Middle Eau Claire		6,900	508,300
Lower Eau Claire		5,600	412,700
Total Loading	613	26,800	1,966,500

Table 5-6: Final water quality results for Eau Claire Lakes Watershed.

It should be noted that the water quality modeling is used here to predict the nutrient and sediment loading from the watershed to the individual lakes. As these lakes are connected, there will also be a transfer of “pollutant loads” from Upper to Middle and to Lower Eau Claire Lakes within the lake system. These affects are not taken into account in this modeling scenario as the purpose of this plan is to address watershed water quality concerns before they enter the lake system and not predict phosphorous concentrations in each lake. The impact of human development in the lakes watershed is estimated to be 37% of the phosphorous loading (runoff and septic system modeling) to the lakes. This suggests that 2.8 micrograms per liter of phosphorous is being contributed per year to the lakes system from human presence in the watershed. Of this, 1.4 micrograms per liter is considered to be septic systems. Caution must be applied in these conclusions. The watershed contribution modeling is at a very early stage and refinement of the model is warranted considering the limited data input at this time.

This modeling effort describes a significant contribution of watershed generated phosphorous to the Lakes. Effective measures are necessary to reduce this pollutant loading. These include the introduction of BMP to reduce the overland nonpoint source runoff as well as address septic systems. The septic system contribution must be considered as an estimate at this time due to the numerous assumptions employed, therefore, we would recommend a Septic System survey to be completed to identify the following for all lakes in this watershed. Once completed the phosphorous loading for the septic systems can be recalculated.

1. For Permanent and Seasonal residences alike per lake and on all lakes:
 - Determine the number of persons per household, seasonal persons and time spent per year per resident.
2. Age of each septic system.
3. Develop phosphorous retention values based on soil type and septic system age.

CHAPTER 6: SHORELINE BUFFERS AND CRITICAL HABITAT

The principal impact on the watersheds occurred during the logging era and the erosion that followed. Removal of topsoils and organic matter by surface water runoff and flooding deposited these materials in the rivers and lakes. The reforestation came slowly along with limited residential and urban development. With development along the shorelines, the desire to view the pristine waters of the lakes resulted in residential developments that offered broad views of the lakes. These areas were typically dedicated to biological monocultures of grasses with some flowering plants and trees. Lawn mowing and urban style landscaping has become the norm as has the application of fertilizers, herbicides, and pesticides.

Shorelines that were once anchored by littoral vegetation, fallen trees, and natural gravel deposits were also altered with aquatic plants and woody debris removed to make way for docks, boat lifts, and boat houses. Gravel deposits were moved to create sandy bathing beaches. Removal of these materials has affected aquatic habitats that have altered the species and diversity of the fauna in the lakes.

These activities resulted in the ability of shoreland runoff waters to collect and deposit directly into the lakes, nutrients and sediments. These pollutants are now causing siltation of once shallow bay areas and the growth of aquatic plants and algae in the lakes. The problem is exacerbated by the century old deposition of the organic matter in the lakes following the logging era which also provides additional nutrients in the lake during the summer months for the lake bottom sediments when the lakes are stratified (see Chapter 3).

6.1 Shoreline Buffer

Shoreline buffers are recently being promoted as a restoration activity that can reduce the continued migration of sediment and nutrients from the shoreland to the lakes. As part of the Lake Management Plan, a survey of the 3 major lakes (Upper, Middle, and Lower Eau Claire Lakes) was conducted in June of 2006. Maps and cataloguing of the shoreland buffer areas in existence at the time of the survey are presented as Figure 6-1 and Table 6-1 for Upper Eau Claire Lake, Figure 6-2 and Table 6-2 for Middle Eau Claire Lake, and Figure 6-3 and Table 6-3 for Lower Eau Claire Lake. Photographs of some of the areas where shoreline buffers are needed are included. In the electronic version of this report, each of these Tables is hyperlinked to the photos so it is relatively easy to access a photographic description of the shoreline in question.

6.2 Critical Habitat

A survey of critical habitat in the littoral zone was also completed as part of the shoreline buffer survey. The presence of fish habitat areas is noted on the following Figures.

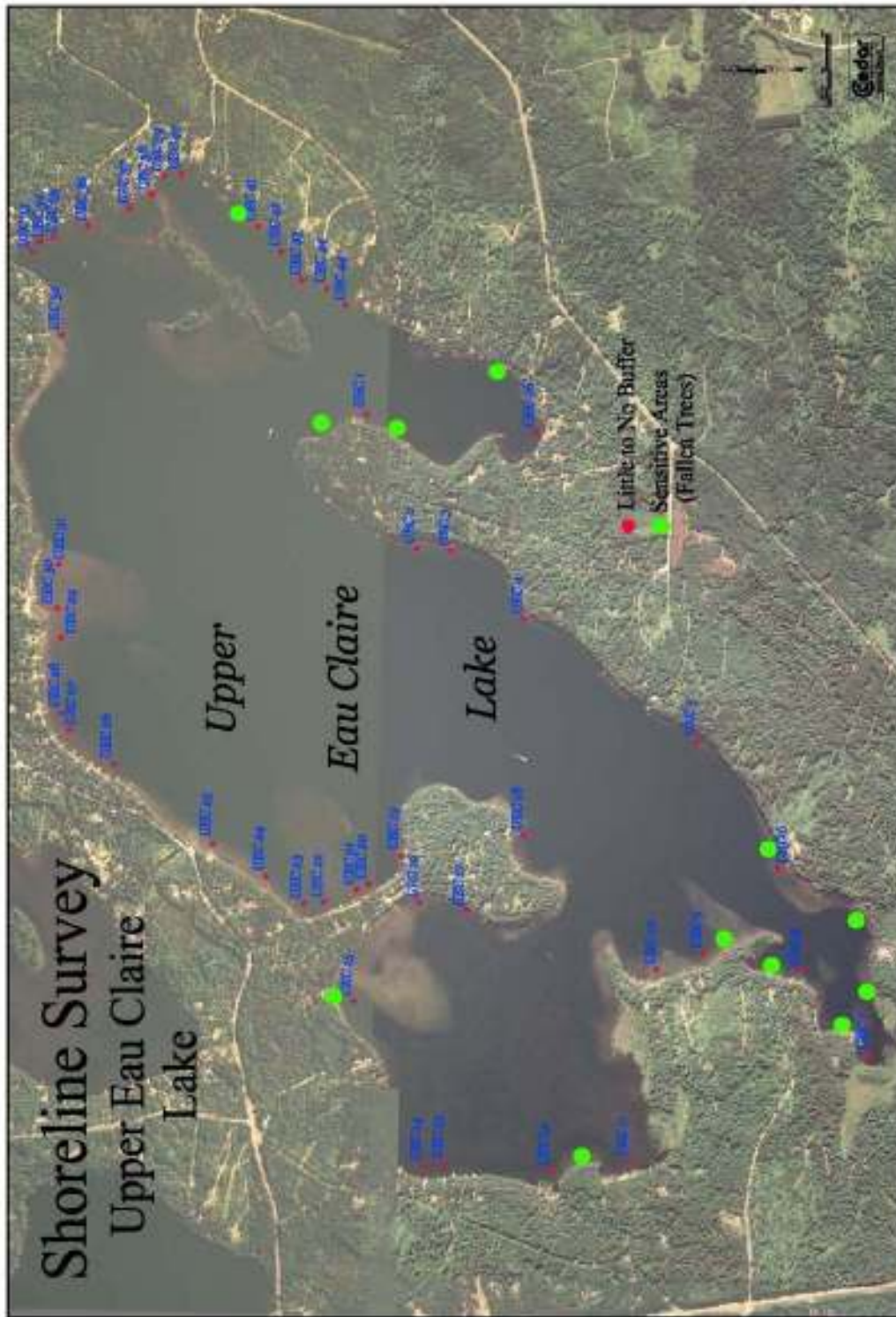


Figure 6-1 Upper Eau Claire Lake – Shoreline Buffer and Critical Habitat Areas

Table 6-1 UPPER EAU CLAIRE LAKE - SHORELINE CONDITIONS CATALOG JUNE 2006						
IDENT	LAT	LONG	TIME	COMMENTS	PHOTO	PHOTO
Uec1	46.30992710	-91.46699457	20-JUN-06 10:40:26AM	Little buffer	Yes	
Uec2	46.30851299	-91.47274515	20-JUN-06 10:45:29AM	No buffer	Yes	
Uec3	46.30753750	-91.47282628	20-JUN-06 10:46:51AM	No buffer	Yes	
Uec4	46.30548687	-91.47573707	20-JUN-06 10:49:19AM	No buffer	Yes	
Uec5	46.30062461	-91.48098841	20-JUN-06 10:54:31AM	Erosion/beach	Yes	
Uec6	46.29834222	-91.48645341	20-JUN-06 10:57:55AM	No buffer	Yes	
Uec7	46.29575179	-91.49440667	20-JUN-06 11:04:10AM	No buffer	Yes	Yes
Uec8	46.29762288	-91.49080387	20-JUN-06 11:07:11AM	No buffer	Yes	
Uec9	46.30040911	-91.49010859	20-JUN-06 11:10:23AM	No buffer	Yes	
Uec10	46.30172993	-91.49080480	20-JUN-06 11:11:44AM	No buffer	Yes	
Uec11	46.30246888	-91.49903172	20-JUN-06 11:18:29AM	No buffer	Yes	Yes
Uec12	46.30469897	-91.49945349	20-JUN-06 11:20:45AM	No buffer	Yes	
Uec13	46.30766566	-91.49917220	20-JUN-06 11:23:18AM	No buffer	Yes	
Uec14	46.30825231	-91.49926934	20-JUN-06 11:23:55AM		Yes	
Uec15	46.31022055	-91.49222737	20-JUN-06 11:29:10AM	No buffer	Yes	
Uec16	46.30839631	-91.48795260	20-JUN-06 11:33:18AM	No buffer	Yes	
Uec17	46.30708303	-91.48830472	20-JUN-06 11:35:12AM	No buffer	Yes	
Uec18	46.30547245	-91.48506730	20-JUN-06 11:41:31AM	No buffer	Yes	
Uec19	46.30892311	-91.48599652	20-JUN-06 11:47:39AM		Yes	
Uec20	46.30982467	-91.48719940	20-JUN-06 11:49:33AM		Yes	
Uec21	46.31014553	-91.48744290	20-JUN-06 11:50:06AM	Erosion/no buffer	Yes	
Uec22	46.31105505	-91.48795964	20-JUN-06 11:51:17AM	Erosion/no buffer	Yes	
Uec23	46.31164648	-91.48801597	20-JUN-06 11:51:57AM	Erosion/no buffer	Yes	
Uec24	46.31269589	-91.48689363	20-JUN-06	No buffer	Yes	

Town of Barnes, Bayfield County, WI and
Barnes-Eau Claire Lakes Property Owners Association

Eau Claire Lakes:

Lake Management Plan

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			11:53:25AM			
Uec25	46.31419474	-91.48548706	20-JUN-06 11:55:23AM	Erosion/no buffer	Yes	
Uec26	46.31697963	-91.48207831	20-JUN-06 11:59:28AM	Erosion	Yes	
Uec27	46.31822677	-91.48060972	20-JUN-06 12:01:43PM	No buffer	Yes	
Uec28	46.31846054	-91.47988996	20-JUN-06 12:02:22PM	No buffer	Yes	
Uec29	46.31847345	-91.47664617	20-JUN-06 12:05:21PM	No buffer	Yes	
Uec30	46.31858493	-91.47538402	20-JUN-06 12:06:36PM	No buffer	Yes	
Uec31	46.31854797	-91.47349943	20-JUN-06 12:08:16PM	Erosion/beach	Yes	
Uec32	46.31851469	-91.46364399	20-JUN-06 12:16:13PM	No buffer	Yes	
Uec33	46.31934266	-91.46005402	20-JUN-06 12:18:54PM	No buffer	n	
Uec34	46.31911006	-91.45963878	20-JUN-06 12:19:40PM	No buffer	n	
Uec35	46.31873480	-91.45939428	20-JUN-06 12:20:42PM	No buffer	n	
Uec36	46.31777692	-91.45892230	20-JUN-06 12:22:48PM	No buffer	n	
Uec37	46.31658996	-91.45818394	20-JUN-06 12:24:42PM	No buffer	n	
Uec38	46.31600029	-91.45758614	20-JUN-06 12:26:01PM	No buffer	Yes	
Uec39	46.31564188	-91.45678869	20-JUN-06 12:27:10PM	No buffer	n	
Uec40	46.31516403	-91.45669724	20-JUN-06 12:28:05PM	No buffer	n	
Uec41	46.31301306	-91.45892875	20-JUN-06 12:31:02PM	Slope	n	
Uec42	46.31233564	-91.46002041	20-JUN-06 12:32:03PM	Erosion/no buffer	n	
Uec43	46.31175251	-91.46124694	20-JUN-06 12:33:05PM	No buffer	n	
Uec44	46.31106603	-91.46160987	20-JUN-06 12:34:04PM	Erosion	n	
Uec45	46.31052523	-91.46231337	20-JUN-06 12:35:19PM	Erosion	n	
Uec46	46.30519073	-91.46777124	20-JUN-06 12:41:56PM	No buffer	n	



Figure 6-2 - Middle Eau Claire Lake – Shoreline Buffer and Critical Habitat Areas

Table 6-2 MIDDLE EAU CLAIRE LAKE - SHORELINE CONDITIONS CATALOG JUNE 2006						
IDENT	LAT	LONG	TIME	COMMENTS	PHOTO	PHOTO
Mec1	46.29760562	-91.51893681	20-JUN-06 1:38:27PM	No buffer	Yes	
Mec2	46.29872175	-91.51799711	20-JUN-06 1:39:44PM	No buffer	Yes	
Mec3	46.29978625	-91.51680185	20-JUN-06 1:41:20PM	Lawn	Yes	
Mec4	46.30008138	-91.51578345	20-JUN-06 1:42:28PM	Lawn	Yes	
Mec5	46.30071354	-91.51420757	20-JUN-06 1:44:05PM	Lawn	Yes	
Mec6	46.30117362	-91.51316595	20-JUN-06 1:45:07PM	Lawn	n	
Mec7	46.30265060	-91.50978360	20-JUN-06 1:48:30PM	Lawn	Yes	
Mec8	46.30573598	-91.51008485	20-JUN-06 1:51:22PM	Slope	n	
Mec9	46.30819674	-91.51083453	20-JUN-06 1:54:52PM	Lawn	Yes	
Mec10	46.30938923	-91.51318666	20-JUN-06 1:57:01PM	No buffer	Yes	
Mec11	46.30617226	-91.52466517	20-JUN-06 2:02:19PM	No buffer	n	
Mec12	46.30584184	-91.52608775	20-JUN-06 2:03:25PM	No buffer	n	
Mec13	46.30457793	-91.52659762	20-JUN-06 2:05:03PM	No buffer	n	
Mec14	46.30234240	-91.53189322	20-JUN-06 2:10:52PM	No buffer	n	
Mec15	46.30210502	-91.53317238	20-JUN-06 2:12:04PM	No buffer	n	
Mec16	46.30185868	-91.53390714	20-JUN-06 2:12:37PM	No buffer	n	
Mec17	46.30155106	-91.53470292	20-JUN-06 2:13:26PM	No buffer	n	
Mec18	46.29949875	-91.53570472	20-JUN-06 2:15:54PM	No buffer	n	
Mec19	46.29872032	-91.53533424	20-JUN-06 2:16:49PM	Beach	n	
Mec20	46.29815622	-91.53497902	20-JUN-06 2:17:36PM	No buffer	n	
Mec21	46.29760570	-91.53426178	20-JUN-06 2:18:37PM	No buffer	n	
Mec22	46.29766974	-91.53256578	20-JUN-06 2:19:45PM	Lawn	n	
Mec23	46.29514134	-91.53058087	20-JUN-06 2:23:19PM	No buffer	n	
Mec24	46.28938749	-91.52807719	20-JUN-06 2:29:15PM		n	
Mec25	46.28728716	-91.52454263	20-JUN-06 2:30:55PM	No buffer	n	
Mec26	46.28263352	-91.52484848	20-JUN-06 2:34:52PM	Lawn	n	
Mec27	46.28129913	-91.52782707	20-JUN-06 2:36:02PM	Lawn	n	
Mec28	46.28099134	-91.52768961	20-JUN-06 2:36:42PM	Lawn	Yes	
Mec29	46.28133877	-91.52280531	20-JUN-06 2:38:51PM	Beach	n	
Mec30	46.28183607	-91.51672248	20-JUN-06 2:41:42PM	No buffer	n	
Mec31	46.28334615	-91.51500829	20-JUN-06 2:42:57PM	No buffer	n	
Mec32	46.28437495	-91.51117492	20-JUN-06 2:44:09PM	No buffer	n	
Mec33	46.28686219	-91.51153953	20-JUN-06 2:47:09PM	No buffer	n	
Mec34	46.28781077	-91.51581053	20-JUN-06 2:49:27PM	No buffer	n	
Mec35	46.29210642	-91.52160804	20-JUN-06 2:53:28PM	No buffer	n	
Mec36	46.29255317	-91.52238278	20-JUN-06 2:54:10PM	No buffer	n	

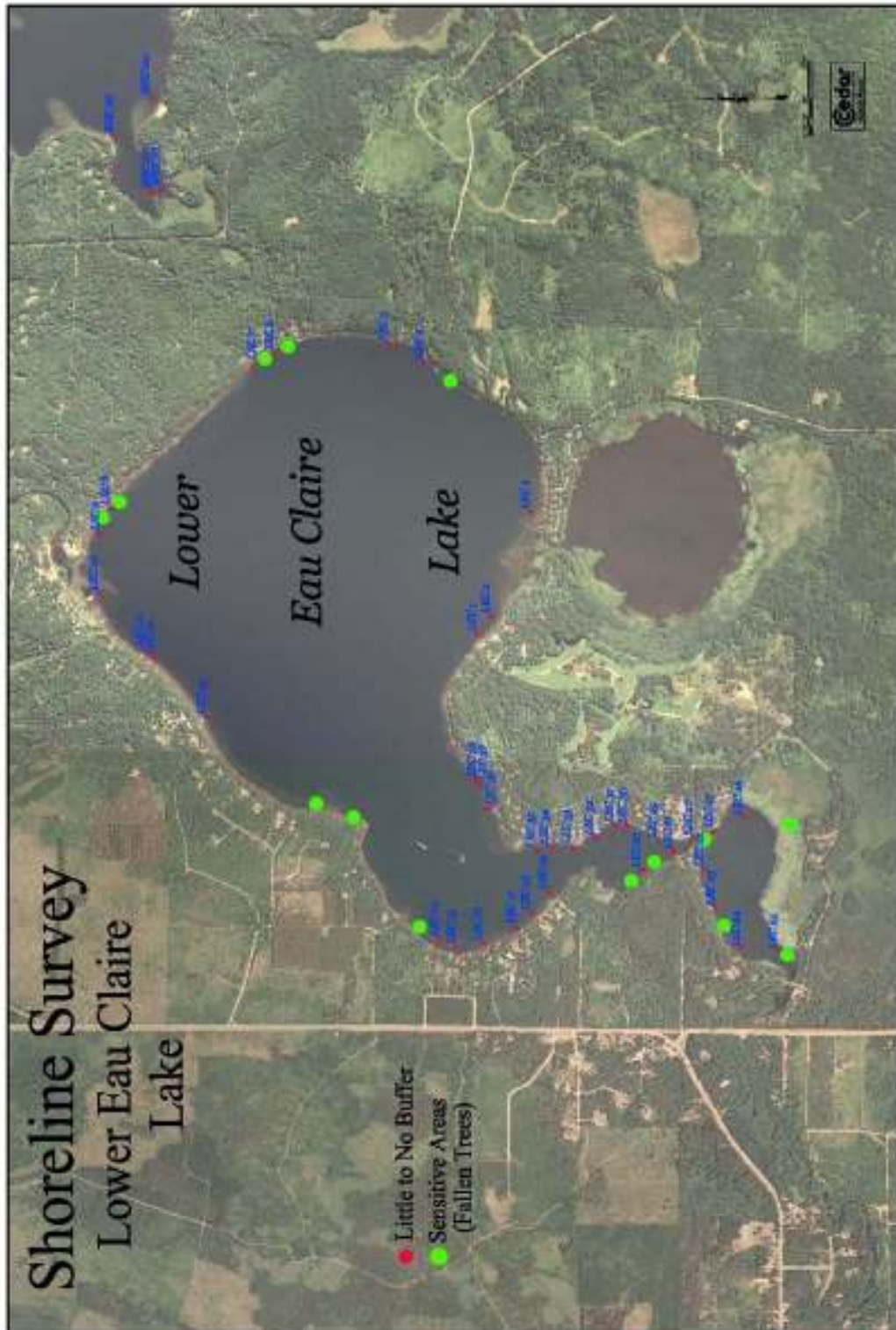


Figure 6-3 Lower Eau Claire Lake – Shoreline Buffer and Critical Habitat Areas

Table 6-3 LOWER EAU CLAIRE LAKE - SHORELINE CONDITIONS CATALOG JUNE 2006						
IDENT	LAT	LONG	TIME	COMMENTS	PHOTO	PHOTO
Lec1	46.26976152	-91.55114268	20-JUN-06 8:03:10AM	No buffer/erosion	n	
Lec2	46.26928484	-91.55020684	20-JUN-06 8:06:30AM	No buffer	Yes	
Lec3	46.26791247	-91.54467537	20-JUN-06 8:10:46AM	No buffer	Yes	
Lec4	46.27168994	-91.53674676	20-JUN-06 8:19:12AM	No buffer	Yes	
Lec5	46.27293340	-91.53579843	20-JUN-06 8:21:15AM	No buffer/erosion	Yes	
Lec6	46.27693232	-91.53630529	20-JUN-06 8:24:36AM	No buffer	n	
Lec7	46.27755510	-91.53683821	20-JUN-06 8:25:45AM	No buffer/erosion	Yes	
Lec8	46.28270410	-91.54461016	20-JUN-06 8:31:16AM	No buffer	n	
Lec9	46.28305748	-91.54591204	20-JUN-06 8:32:54AM	No buffer	Yes	
Lec10	46.28306653	-91.54910688	20-JUN-06 8:37:35AM	No buffer	Yes	
Lec11	46.28147339	-91.55206502	20-JUN-06 8:40:20AM	No buffer	Yes	
Lec12	46.28111766	-91.55255067	20-JUN-06 8:41:10AM	No buffer	Yes	
Lec13	46.27925444	-91.55567779	20-JUN-06 8:44:42AM	No buffer	Yes	
Lec14	46.27104538	-91.56739779	20-JUN-06 8:58:00AM	No buffer	Yes	
Lec15	46.27046744	-91.56773273	20-JUN-06 8:59:12AM	No buffer	Yes	
Lec16	46.26950470	-91.56756274	20-JUN-06 9:00:59AM	No buffer/erosion	Yes	
Lec17	46.26831388	-91.56671667	20-JUN-06 9:02:57AM	Erosion	n	
Lec18	46.26777216	-91.56595317	20-JUN-06 9:04:52AM	No buffer	Yes	
Lec19	46.26718995	-91.56484860	20-JUN-06 9:07:55AM	No buffer/erosion	Yes	Yes
Lec20	46.26393677	-91.56367430	20-JUN-06 9:12:17AM	No buffer	Yes	
Lec21	46.26282365	-91.56268925	20-JUN-06 9:14:13AM	No buffer	Yes	
Lec22	46.26171439	-91.56360992	20-JUN-06 9:17:21AM	No buffer	Yes	
Lec23	46.26133008	-91.56560716	20-JUN-06 9:19:52AM	Little buffer	Yes	
Lec24	46.26039374	-91.56773390	20-JUN-06 9:22:49AM	No buffer	Yes	
Lec25	46.25909437	-91.56785494	20-JUN-06 9:25:43AM	No buffer	Yes	
Lec26	46.26033666	-91.56085890	20-JUN-06 9:31:23AM	No buffer	Yes	Yes
Lec27	46.26139705	-91.56156063	20-JUN-06 9:32:54AM	No buffer	Yes	
Lec28	46.26211454	-91.56193564	20-JUN-06 9:34:11AM	No buffer	Yes	
Lec29	46.26333009	-91.56206329	20-JUN-06 9:35:49AM	No buffer	Yes	
Lec30	46.26445779	-91.56134371	20-JUN-06 9:38:48AM	No buffer	Yes	
Lec31	46.26488493	-91.56131437	20-JUN-06 9:39:46AM	No buffer	Yes	
Lec32	46.26556847	-91.56196573	20-JUN-06 9:40:58AM	No buffer	Yes	
Lec33	46.26637020	-91.56252069	20-JUN-06 9:42:11AM	No buffer	Yes	
Lec34	46.26711418	-91.56246856	20-JUN-06 9:43:24AM	Erosion	Yes	
Lec35	46.26761424	-91.56264894	20-JUN-06 9:44:25AM	No buffer	Yes	Yes
Lec36	46.26941543	-91.56043980	20-JUN-06 9:49:28AM	No buffer/erosion	Yes	
Lec37	46.26965440	-91.55916056	20-JUN-06 9:51:30AM	No buffer	Yes	
Lec38	46.26977418	-91.55890742	20-JUN-06 9:52:10AM	No buffer	Yes	

CHAPTER 7: COMMUNITY SURVEY

7.1 Town of Barnes Land Use Planning Community Survey

Also of note are the results from the recent Comprehensive Land Use Planning Project community Survey. This survey and its results are included as Appendix G.

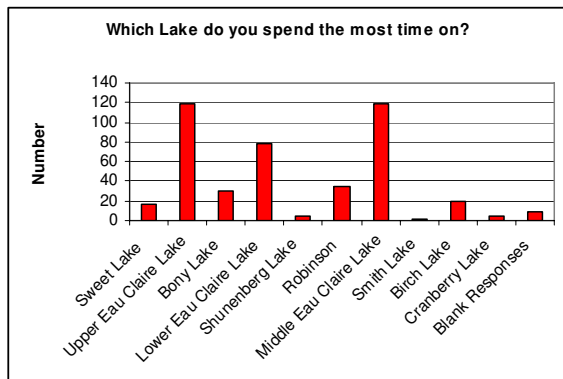
7.2 Barnes-Eau Claire Lakes Property Owners Association Community Survey

The Barnes-Eau Claire Lakes Area Property Owners Association and Cedar Corporation designed a community Sociological Survey to assess the area residents' perceptions of the Lakes and solicit their comments. The survey was approved by the WDNR and is included in Appendix F along with Survey Report and Comments.

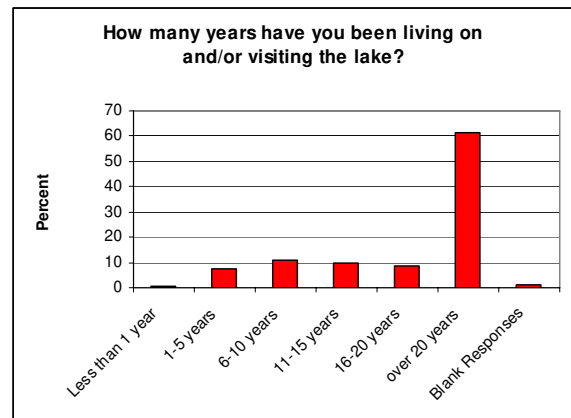
In summer of 2006 a Sociological Landowner Survey was sent to property owners within the Eau Claire Lakes Watershed Planning Area. The survey was designed to assess landowner views and concerns about local lake issues. Approximately 970 surveys were sent out and 438 were returned (45% response rate).

Background Data

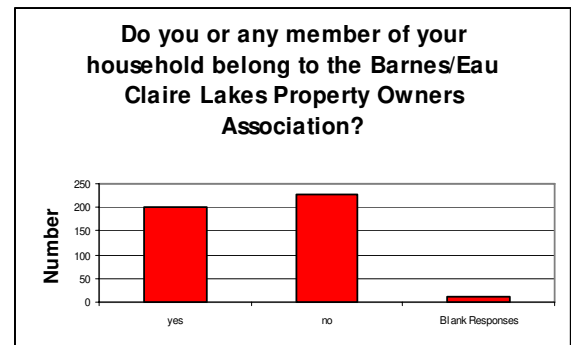
Over 72% of the respondents spend the most time on either Upper, Middle, or Lower Eau Claire Lakes.



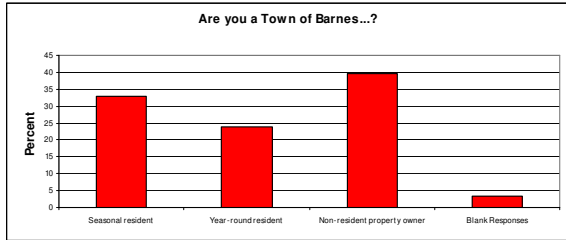
A majority of the respondents have been living on or visiting the lake for over 15 years.



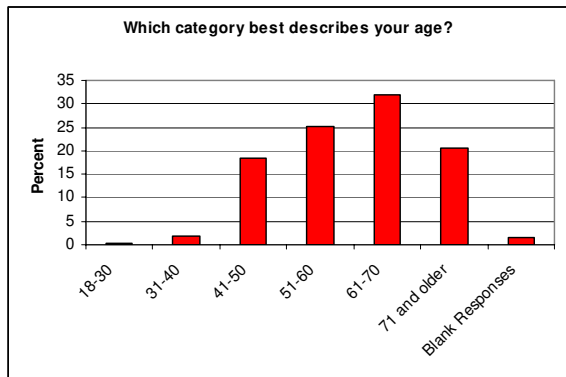
Slightly less than half of the respondents belong to the Barnes/Eau Claire Lakes Property Owners Association.



Only 23% of the respondents to the survey are year-round residents.

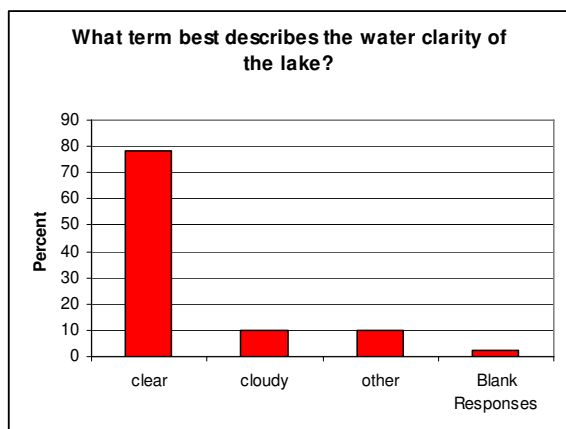


The majority of the respondents are over the age of 50.



Water Quality

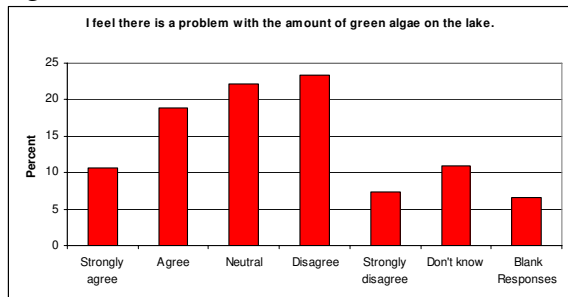
Most of the people feel the lake water is clear.



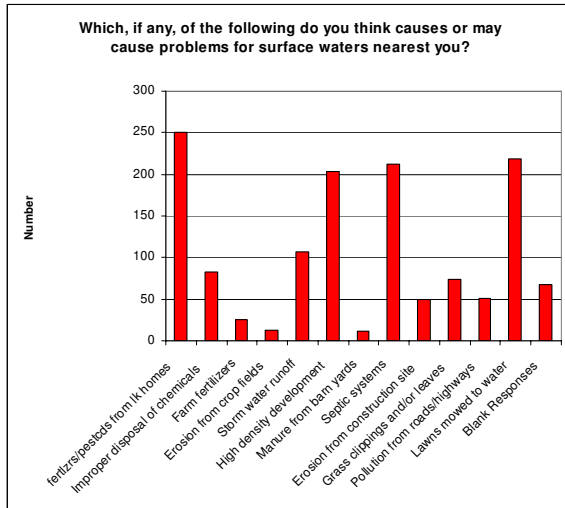
Although a majority of the respondents felt the health of the lake this past summer was about the same as the previous year, nearly 30% of respondents felt the health of the lake was worse this past year than the previous summer. When compared to previous years, even more people feel the health of the lake was worse this past year.



Only about 30% of the respondents feel there is a problem with the amount of green algae on the lake.

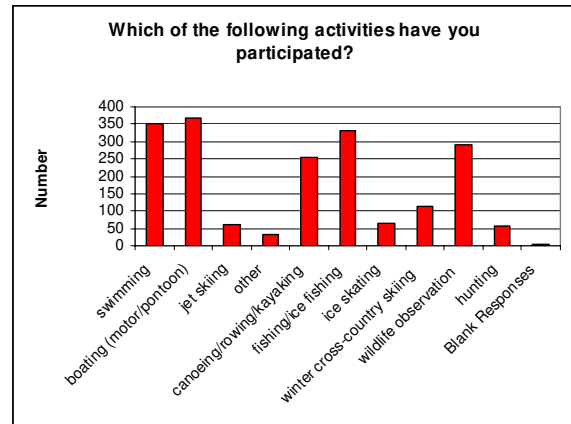


The top four items people feel harm the lake are fertilized lawns, lawns mowed to the lakeshore, septic systems, and high density development.

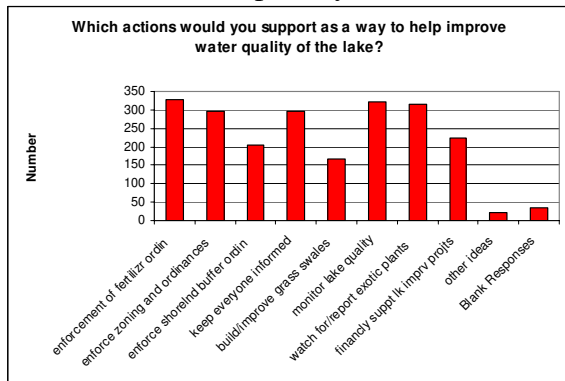


Lake Resources

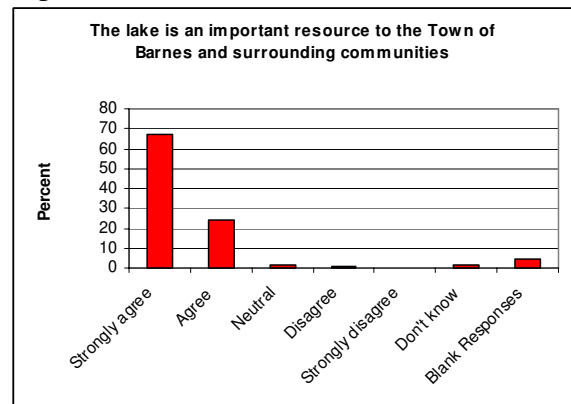
Most of the respondents use the lake for some form of motorized activity. Two of the top four categories with the most responses are wildlife related.



A majority of respondents would support the following methods to help improve the water quality of the lake: enforce fertilizer ordinance, monitor water quality, report exotic plants, enforce existing zoning and ordinances, and keep everyone informed.

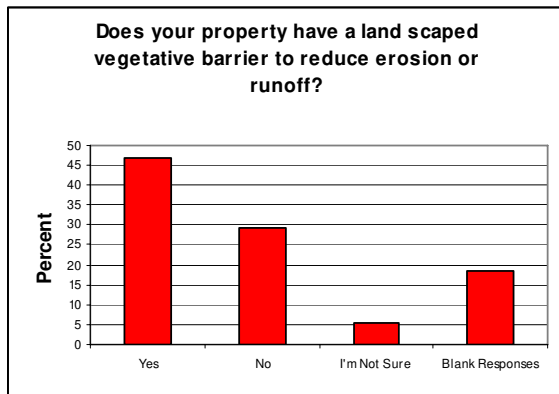


A majority of people also feel the lake is an important resource to the Town of Barnes.

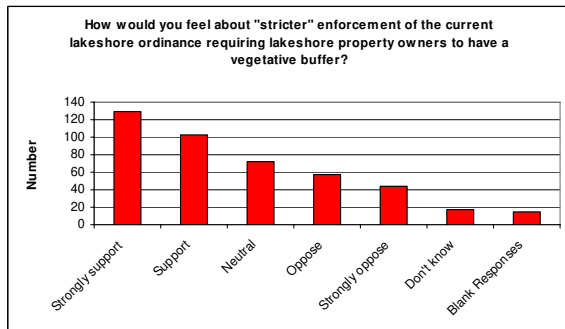


Lakeshore

Nearly 50% of respondents have some form of vegetative buffer to reduce runoff, however there were a high number of blank responses and almost 30% said they do not have a buffer. The balance are unsure or chose not to respond.

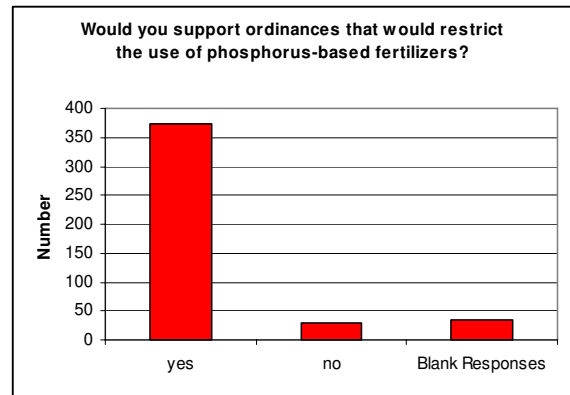


Over half of the respondents would support stricter enforcement of the lakeshore vegetative buffer ordinance.

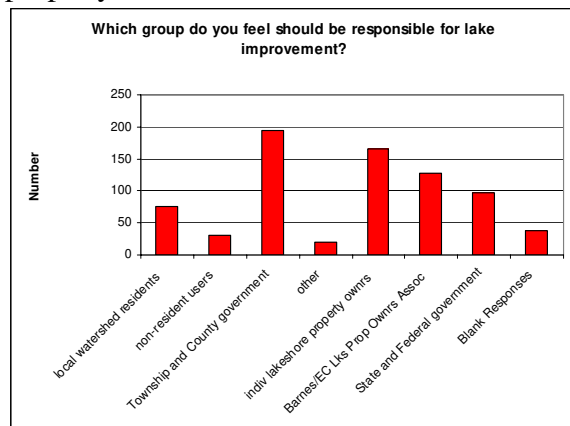


Lake Enforcement and Responsibility

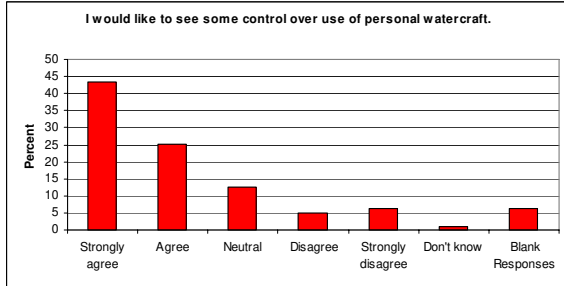
Slightly over 85% of the respondents would support an ordinance restricting phosphorus-based fertilizers.



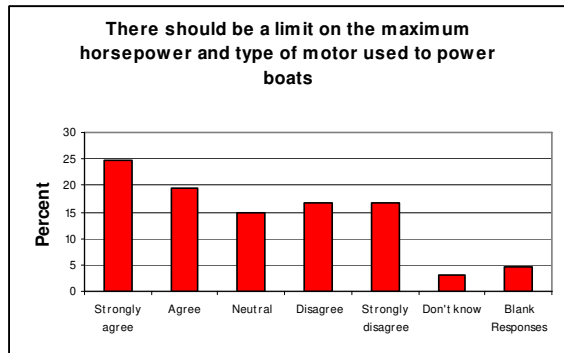
A large number of people feel the Town and County government should be responsible for lake improvement while over 40% of the respondents feel it's up to the individual property owner.



More than 68% of the people are in favor of regulations on personal watercraft with another 12% responding as being neutral.

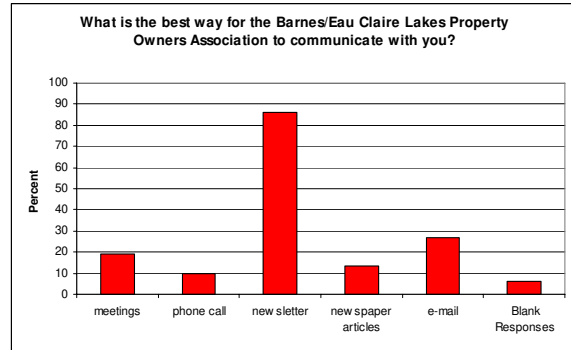


Over 40% of the people would like to see a limitation on the maximum horsepower used to power boats.

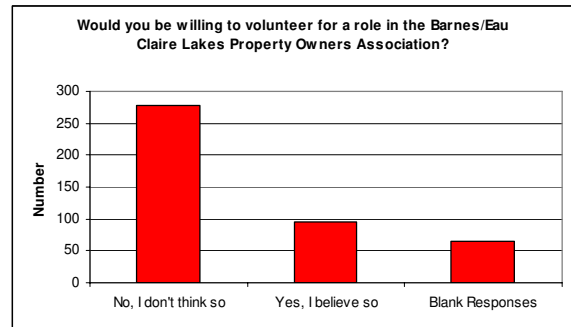


Barnes/Eau Claire Lakes Property Owners Association

A majority of respondents felt a newsletter was the best way to communicate with them.



Nearly 100 people are willing to volunteer for a role with the Association.



There are a significant number of residents in the Town of Barnes concerned about the future of lake water quality. Education of these individuals in developing runoff water quality and quantity control efforts will provide the Eau Claire Lakes area with a significant resource to address current and future water quality issues.

CHAPTER 8: WATERSHED WATER QUALITY IMPROVEMENTS

A number of actions to slow or stop the degradation of water quality in the Eau Claire Lakes is recommended. Perhaps the most difficult task is the ongoing development and continuation of an information and education program to promote and foster an awareness of water quality concerns among residents and non-residents of the region. Individuals, local government, and area businesses alike need to assume an increasing responsibility for protecting water quality of the area lakes.

This report documents that a variety of factors affect the water quality of the lakes. These include nonpoint source pollutants – primarily sediments and nutrients (phosphorous and nitrogen), groundwater, precipitation, and background or natural sources. Similar lakes in this region have the appearance of being healthy BUT the lakes should be considered fragile. Water quality by visual inspection appears mesotrophic, but certain parameters such as phosphorous and chlorophyll *a* can be considered eutrophic (Chapter 3) at times. Clearly, the water quality of the Lakes as a whole is considered as becoming more eutrophic. Thus, the Association Board, its members, the surrounding populace, and visitors to the Lakes all need to be sensitive to the existing water quality. Initially they should be encouraged to adopt those necessary measures to be protective of the water quality of the Eau Claire Lakes. If encouragement is not enough, then ordinances requiring water quality improvements must be enacted **AND** enforced if the lake water quality is to be protected.

This Plan is only as good as it is used and updated. To measure the progress of lake improvement and to document achieved goals, it is encouraged to revisit the plan annually and update and discuss plan initiatives with local political groups. Continuing the on-going volunteer lake water quality monitoring program will help assist in this process.

8.1 Runoff Water Best Management Practices (BMPs)

Best Management Practices (BMPs) are measures intended to reduce or mitigate storm water runoff water quantity and water quality concerns to the maximum extent practical. Certain measures can help reduce impacts, but no BMP will reverse the damages caused by previous forestry and agricultural practices, residential construction, and urban development.

In general, BMPs to control runoff water quantity and quality include:

1. **Source control measures** focus on minimizing or mitigating the source of the pollution so that pollutants are prevented from contacting storm water runoff or from entering the drainage conveyance system.

2. **Treatment control measures** are designed to remove a percentage of the pollutants after they have entered storm water runoff. Treatment control measures tend to be more expensive than source control measures.

Specific educational and design materials such as “*EPA Fact Sheets on Select Best Management Practices*” and “*Bayfield County Guidelines for Shoreland Restoration*” (Appendix E) available for Additional Reading. Most source control measures tend to be non-structural, that is regulatory in nature (setbacks, construction techniques, etc.), and most treatment BMPs tend to be structural in nature, although there can be exceptions.

Watershed wide non-structural best management source controls include:

- Balanced land use planning
- Education
- Ordinances and incentives to improve storm water runoff quality
- Construction site erosion control regulations and enforcement
- Leaf and lawn waste control
- Fertilizer and pesticide application control
- Pet and farm animal waste control
- Storm water management planning education
- Hazardous waste and spill prevention program

Best management treatment controls include:

- Shoreline Restoration and buffers
- Appropriate use of fertilizers
- Improve littoral zone habitat
- Stop lawn mowing and down to the water’s edge
- Divert shoreline property water runoff to rain gardens, infiltration basins, etc away from the lake
- Septic System Maintenance
- Wet detention sediment basins
- Construction site erosion control
- Long term storm water management for developments
- Constructed wetlands
- Infiltration basins and trenches
- Dry detention/retention basins
- Sump storm sewer inlets
- Riprap
- Gabions or stone weeper berms
- Construction of grassed channels and drainage ways
- Silt fence
- Multi-Chambered Treatment Train (MCTT)
- Water quality pre-treatment box structure, i.e. Stormceptor,

- Straw bales and silt fence

Using non-structural best management practices rather than using expensive structural best management practices is considered most cost effective in gaining a large percentage of water quantity and quality control benefits. These controls require individuals and local government units to alter their habits and introduce changes in activities that will directly lead to improved water quality discharges. However, some structural controls must be provided in order to obtain the greatest amount of pollutant reduction and flood control within the Eau Claire Lakes Watershed.

Rural and developing areas allow for unique opportunities to incorporate creative BMPs into site design. The BMPs can be incorporated into natural areas serving as open spaces for community enjoyment. This idea can be expanded into a fingerprinting concept that requires developments to duplicate BMPs to some extent at each site.

Another technique is for the local authorities, with assistance of WDNR grant programs, to purchase land next to a water resource and create a buffer strip (conservation area) around the area and construct structural BMPs. In certain cases, this may be the only way to protect a sensitive water body from further degradation, even with several structural and non-structural BMPs in place.

The following best management practices are recommended to be implemented to address excessive water quantity and high pollutant loadings within the Eau Claire Lakes Watershed.

8.2 Property Owners

8.2.a. Shoreland Restoration

The reconstruction of the barren or monoculture shoreline with native plant life and infiltration areas is an important step in reducing the sediment and nutrient loading from shoreland properties. This is especially effective for those properties with steep slopes that lead to the lake. The management practice should be installed at the top of the slope where feasible. Implementing the County determined setback on existing properties dependent on the Lake Classification (see Appendix E – Bayfield County Guidelines for Shoreland Restoration) is considered one of the most important activities as the current state of the lakes can only be affected by watershed practices as there are no upstream influences on lake water quality. Protection of the lake water quality is, therefore, dependent on controlling erosion and water flow in the watershed.

8.2.b. Septic Systems

The permeable nature of the soils present in the region provides most home owners with the financial benefit of a conventional septic system. That is a drain field as opposed to a

mound system. This is a mixed blessing as the highly permeable sands and gravels allow the untreated nutrients in wastewater to migrate quickly through the sub surface to ground water. As ground water has little treatment or capture capability for nutrients, these pollutants migrate with ground water flow into local receiving waters (streams, tributaries, and lakes). Regular pumping of septic systems is recommended to improve its life and to reduce overloading of the drain field with nutrients. An overlapping regulation to address the so-called “grandfathered” septic systems is highly recommended to address pumping and other maintenance issues.

8.2.c. Reduce Fertilizer Usage

Soil test lawns and add only the necessary fertilizers. Encourage Douglas and Bayfield Counties to implement by ordinance that only no or low phosphorous fertilizers can be used in the Minocqua-Kawaguesaga Lakes watershed. Other communities have instituted such an ordinance and local stores only supply this type of fertilizer. For example, Minnesota currently has a 0% phosphorus regulation for the Twin Cities metro area and 3% phosphorus for all greater Minnesota. And Amery, Wisconsin, has an ordinance that does not allow the sale of fertilizer containing phosphorus.

8.2.d. Reduce Phosphate Soap Usage

Examine the labels of your household cleansers and reduce your reliance on those cleaners that have phosphates in them. For example, automatic dishwashing soap cubes contain as much as 9% phosphates for each application. The wastewater from your dish water is directed to your septic system which will discharge soluble phosphorous directly to ground water. Ground water enters the rivers and lake system and soon you observe increased algal growth.

8.2.e. Redirect Storm Water from Gutters, Driveways, and other Impervious Surfaces

Collecting water from impervious surfaces and directing it toward infiltration areas, such as rain gardens and forested areas. Considerable assistance in the forms of designs, recommendations, and financial assistance is available from local greenhouses, County extensions, and others as you develop site specific shoreland runoff controls.

8.2.f. Shoreline Erosion

Protecting your shoreline from erosion is a state regulated activity. The erosion of the shoreline is most likely directly associated with the past removal of trees and shrubs, bushes, etc that were naturally protecting the bank from erosion. Re-establishing the shoreline buffer is an important step in stopping erosion, but continued wave action at the exposed lake bank may be causing bank slumping. Riprap placement along the shoreline is not only unattractive but dangerous. Winter ice movement will remove the riprap over

time. Other tools are available to help reduce shoreline erosion. Many of these are manufactured of biological materials and include BioLogs, ShoreSox, among others.

8.2.g. Shoreline Inventory

A survey of the shorelines along the Eau Claire Lakes was completed as a part of this project. It is recommended that a survey be completed on all of the other lakes within the Eau Claire Lakes Watershed Planning Area. Having a shoreline buffer inventory for the entire watershed area would allow the property owners to see which areas may need additional vegetative buffers to assist in the protection of water quality.

8.2.h. Shallow Lake Restrictions

There are a number of shallow lakes within the Eau Claire Lakes Watershed Planning Area that are connected to the Eau Claire Lakes chain. Restricting high horsepower boats and implementing a slow/no wake zone in others will reduce shoreline erosion and the amount of phosphorus that is stirred up from the sediment and being carried into the Eau Claire Lakes.

8.2.i. Encourage Lake Shoreline Improvement Projects

Encourage shoreline improvement projects including demonstration plots, County or Town tax credits, etc. County and UW-Extension agents can provide assistance in demonstration of the appropriate techniques needed.

8.3. Town and Association Activities

8.3.a. Invasive Species Management

- Assist Wisconsin DNR with aquatic invasive species inspections on the Lakes and at boat landings.
- Develop an Aquatic Plant Management Plan to describe problem species and areas of interest.
- Incorporate aquatic invasive species programs in the Aquatic Plant Management Plan.

8.3.b. Monitoring Programs

- Continue an annual water quality monitoring program.
- Explore the possibility of a USGS study to evaluate the nutrient balance and also of groundwater to determine the extent of groundwater contribution of phosphorus to the Eau Claire Lakes.
- Conduct an historic water quality evaluation by conducting a paleolimnological study. Evaluating historic trends in lake sediment through this research technique

can provide insight to past water quality issues. Sediment cores would be taken at strategic locations throughout the lakes. The core samples are then sampled and analyzed for various nutrients, metals, and biological remains (diatoms) to evaluate past water conditions, sedimentation rates, etc. This could help refine watershed wide and shoreland property BMPs.

8.3.c. Government Policies

- As State, County, and Town transportation departments minimize the use of road salt, an increase in sand content is common. They should consider the use of alternative de-icing compounds in areas served by bridges over the Lakes, and related tributaries, swales, etc., boat landings, culverts or storm water outfalls, and other areas of high salt-use. Snow disposal areas should not drain into lakes or streams. The Wisconsin Department of Transportation should work with the Towns to explore the best method for ensuring safe roads, minimal salt usage, and minimum impact to the Lakes.
- Utility and Highway Corridors:
 - Proper route selection.
 - Encourage runoff from roads to be directed to sedimentation traps or water-quality pre-treatment ponds before runoff reaches the lakes.
 - Require Wisconsin DOT construction contractors to follow Wisconsin DNR NR 151 runoff management ordinances for future construction. Encourage the use of BMPs to trap road runoff for pretreatment before entering the Lakes.
 - Don't dump sand on the waterfront.
 - Local emergency officials should be prepared either as first responders or have readily available information to protect ground and surface water resources from spill contamination (i.e. gasoline, etc.). Spill preparedness should include adequate training and equipment, such as containment booms and spill absorbents. Emergency response consultants can assist fire fighters and emergency crews in spill contingency planning.
- Develop a partnership with the Town of Gordon to expand a uniform code of shoreland policies for the Eau Claire Lakes Watershed.
- Share information pertaining to water quality studies and activities with the Town of Gordon
- Incorporate the Town of Gordon in watershed activities.

8.3.d. Regional Partnerships

- Work with groups and building more partnerships will help implement more BMP practices throughout the Eau Claire Lakes watershed. Partnership development with Association members in the Lakes and adjoining watersheds is highly encouraged.

Partnerships with related Townships and Counties, Natural Resource Conservation Service, UW-Extension, Wisconsin DNR Forestry and Water Quality, and others should be developed.

- Develop local ordinances to help reduce the degradation of the watershed waters from nonpoint source pollution. Ordinances provide the legal frame work for requiring suitable management practices to control nonpoint source pollution. Adopting erosion control and storm water management ordinances (these are Lake Protection grant eligible activities) can specify performance standards, specific BMP, or limit peak runoff flow. In future years, as more land is developed, managing runoff to protect water quality will become increasingly important and the ability to control runoff will be limited if the proper ordinances are not in effect.
- Various Wisconsin communities are using erosion control and storm water management ordinances to regulate pollution prevention for both water quality and water quantity objectives. A comprehensive storm water management ordinance can provide assurance that future growth will not be significantly detrimental to water resources in the lake watershed. To assist in ordinance creation, the Wisconsin DNR has developed model ordinances that can be adopted or used as a starting point in creation of Town's own ordinance. Ordinances will consider runoff volumes, property size, pollutant loads, etc.
- Financing ordinance administration to avoid over burdening taxpayers is recognized as a major concern in ordinance adoption (Chapter 8). Developing financing alternatives and administrative strategies may reveal acceptable costs for enacting an erosion control and/or storm water management ordinance. The Town should consider retaining the services of an engineer or other professional experienced in storm water management and design, to review new development proposals for compliance with the Town's ordinance(s).

8.3.e. Implementation Committee

- Recommendations are an important aspect of lake planning. It can only be accomplished if there are people to implement the recommendations of the plan. Once the plan has been approved it is important to establish a committee to take on the responsibility of implementing the recommendations.

8.4. Forest Land Management

-
- Require reforestation of forested lands.
 - Follow Wisconsin DNR Forestry Best Management Practices.
 - Leave timber on steep slopes.
 - When crossing streams and gully areas, build bridges per Wisconsin DNR Forestry Best Management Practices and uphold NR 151 Runoff Management rules.

- Should timber be taken from steep slopes or lowland areas, perform this work between January and March to ensure frozen ground conditions that will reduce erosion as a result of the logging activity. Leave the stumps to help maintain the soil texture and minimize erosion.

8.5 Development Requirements

Detention storm water pond BMPs capture storm water runoff and remove pollutants through settling and/or biological uptake. The BMPs presented in this Plan can reduce water quality pollutant discharges, stream bank erosion and flooding by temporarily detaining and controlling peak discharge rates and pretreating runoff before releasing it at flow rates and frequencies similar to those occurring under natural hydrologic and hydraulic conditions. Detention storm water ponds can be designed to enhance wildlife habitat, provide an aesthetic amenity and satisfy some of the site landscape needs. In some areas, they may require appropriate designs to prevent groundwater contamination. Additionally, consideration should be made of the long-term maintenance and sediment disposal requirements of detention storm water pond BMPs before they are applied. Storm water ponds include:

8.5.a. Dry Extended Detention (ED) Ponds

Dry ED storm water ponds are designed to intercept a rate and volume of storm water runoff and temporarily detain, pre-treat, and impound the water for gradual release to the receiving stream or storm sewer conveyance system (Figure 8-1). Another common name associated with the Dry ED pond is “detention ponds.” Dry ED ponds are typically end-of pipe BMPs that are designed to completely empty after and between storm water runoff events, which allows for the control of storm runoff and provide some water quality treatment through infiltration.

8.5.b. Wet Detention Ponds

Wet storm water detention ponds are the most effective and most commonly used best management practices to flooding, sedimentation, and numerous pollutants found in storm water runoff. They are reliable and attractive systems that control storm water quality and quantity. They are the most cost effective systems to operate and maintain. These systems consist of single or multiple permanent pools of water or a combination of a single permanent pool of water with a pretreatment sedimentation area (or sediment forebay). Wet detention ponds treat incoming storm water and discharge improved storm water quality to sensitive receiving water bodies and groundwater recharge areas. Wet detention basins are typically engineered with four to eight feet of standing static water levels, allowing sediments and pollutants to settle out to the bottom of the wet detention pond. Wet detention ponds should have a defined sedimentation basin forebay, and an outlet control structure.

8.5.c. Constructed Storm Water Treatment Wetlands

Constructed storm water wetland systems incorporate natural wetland functions to aid in peak flow reductions and pollutant removal from storm water runoff. These BMPs contain shallow pools that enhance growing conditions for marsh plants to maximize pollutant removal. Constructed storm water wetlands can also provide for quantity control of storm water by providing significant volume storage of ponded water above the permanent pool elevation. (This alternative will be impractical unless proper soils are present.)

8.5.d. Infiltration Facilities

Infiltration facilities are designed to intercept surface runoff and retain it long enough to allow it to enter the underlying soil. Infiltration may be allowed on a case-by-case basis, depending on the soil and water table conditions and elevations of a site. Site-specific soil testing will be required. To help prevent clogging, pretreatment will be required whenever possible and feasible.

***i.* Infiltration Basin**

Infiltration basins are also called Bioretention Basins. These Bioretention Basin BMPs are designed to normally contain the following components: a temporary ponding area, a mulch layer, a sandy or loamy planting soil, the plants, and, where necessary, under drains.

Most bioretention devices are off-line basins designed to infiltrate a portion or all of the flow up to the desired design storm event. However, bioinfiltration swales represent a cross between a bioretention basin and a vegetated swale. They are designed for conveyance as well as infiltration.

***ii.* Infiltration Trenches**

Infiltration trenches are designed to intercept and reduce direct site surface storm water runoff rates and volume. They hold runoff long enough to allow it to enter the underlying soil. They can include layers of coarse gravel, sand or other filtering media to filter the runoff before it infiltrates the soil.

Infiltration trenches are shallow (three to eight feet deep) and constructed in relatively permeable soils that are backfilled with a sand filter, coarse stone, and lined with filter fabric. The trench surface can be covered with grating and/or consist of stone, gabion, sand, or a grassed covered area with a surface inlet. Depending on the design, trenches allow for the partial or total infiltration of storm water runoff into the underlying soil. An alternative design is to install a

pipe in the trench and surround it with coarse stone (French drain); this will increase the temporary storage capacity of the trench.

8.6 Implementation of Structural BMPs:

See Figure 8-1 for a map of BMP locations. Please note that the majority of the BMPs shown on Figure 8-1 are New Development BMPs that will be installed by the developers.

8.6.a. Installation of proposed BMPs for new development areas.

Location: Multiple

Watershed: Multiple

Target: Quantity Control and Water Quality

Notes:

- As developers or land owners approach the Towns for the various approvals necessary to develop, the Towns should continually address the need to set aside land for the construction of BMPs. Because it is unknown at this time the rate or sequence of development of these areas, the locations of these BMP's cannot be accurately located. However, based on the differences between existing and future land use, examples of approximate BMP locations are suggested on Figure 8-1.
- A Township Storm Water Management Ordinance would require developers to pay for storm water BMP implementations on their development property prior to acceptance and approval of the new development project by the Township. The Township does not intend to use general revenue funds to pay for any newly proposed BMPs for new developed areas. Thus, the proposed regional BMP sites may require creative developer agreements.

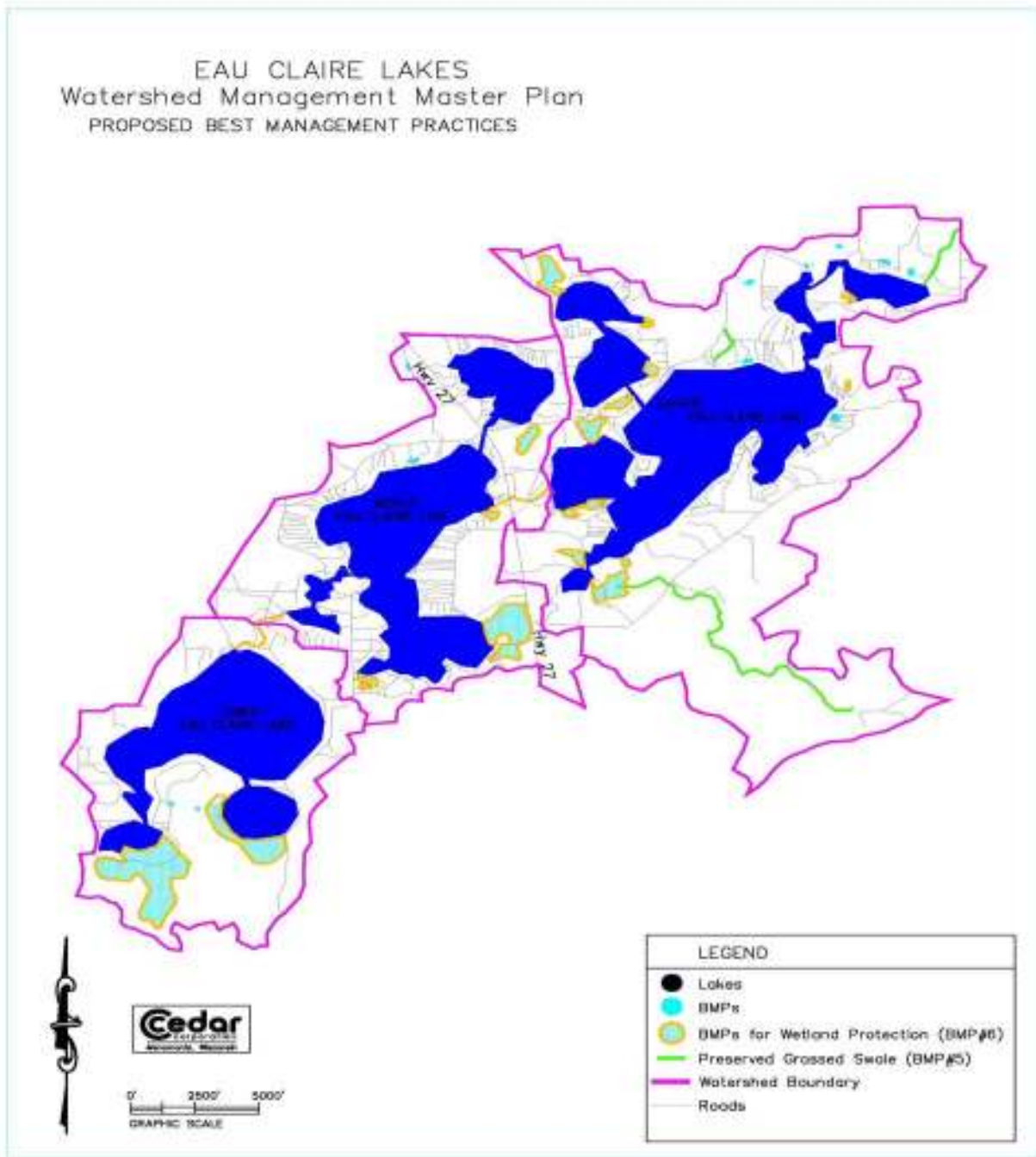


Figure 8-1 Proposed Best Management Practices

8.6.b. Implement Swale Easements in natural drainage ways.

Location: As defined on Figure 8-1.

Target: Improve water quality.

Notes: The easement should prohibit development, limit grazing cows, and maintain mature vegetation.

8.6.c. Implement BMPs around wetlands.

Location: As defined on Figure 8-1.

Target: Improve water quality.

Notes: Wetlands help remove pollutants from storm water and attenuates peak runoff rates. Therefore the wetlands should be protected. Protection can be provided by means of 20' wide buffers (undisturbed area) or ponds (wet-, dry-, or infiltration ponds). When new developments are proposed near wetlands, one should keep in mind that the developer is required to reduce TSS [Total Suspended Solids] by 80% before reaching the wetland.

8.6.d. Implement BMPs around the golf course

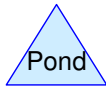
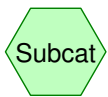
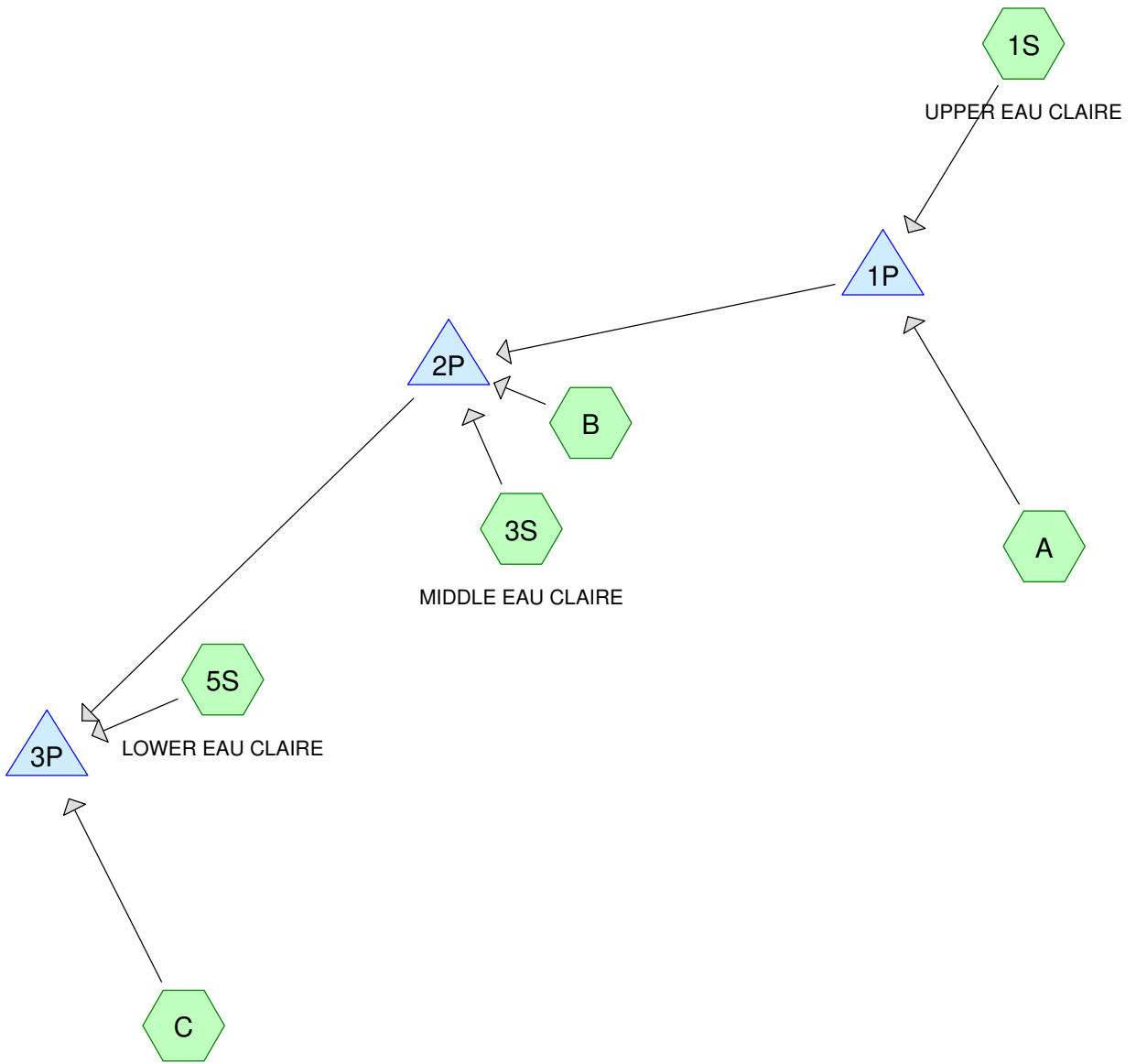
Location: As defined on Figure 8-1.

Target: Improve water quality.

Notes: Golf courses can potentially contribute to large amounts of nutrients to a water body. Properly designed wet ponds or infiltration basins will reduce the nutrient export to the lake. Two possible BMP locations are shown on the map.

Appendix A

HydroCAD Modeling Reports



Drainage Diagram for Barnes - Existing
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Barnes - Existing

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Area Listing (all nodes)

<u>Area (acres)</u>	<u>CN</u>	<u>Description (subcats)</u>
4,583.000	39	(A)
1,809.000	42	(C)
2,227.000	44	(B)
3,446.000	99	(1S,3S,5S)
<hr/>		
12,065.000		

Barnes - Existing

Type II 24-hr 2-YR Rainfall=2.60"

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Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: UPPER EAU CLAIRE

Runoff Area=1,470.000 ac Runoff Depth=2.48"

Flow Length=22,750' Tc=12.4 min CN=99 Runoff=4,406.56 cfs 304.118 af

Subcatchment 3S: MIDDLE EAU CLAIRE

Runoff Area=1,072.000 ac Runoff Depth=2.48"

Flow Length=18,490' Tc=13.2 min CN=99 Runoff=3,142.29 cfs 221.778 af

Subcatchment 5S: LOWER EAU CLAIRE

Runoff Area=904.000 ac Runoff Depth=2.48"

Flow Length=13,360' Tc=8.4 min CN=99 Runoff=3,066.39 cfs 187.022 af

Subcatchment A:

Runoff Area=4,583.000 ac Runoff Depth=0.00"

Flow Length=17,130' Slope=0.0300 '/' Tc=530.3 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment B:

Runoff Area=2,227.000 ac Runoff Depth=0.00"

Flow Length=6,412' Slope=0.0360 '/' Tc=192.8 min CN=44 Runoff=0.17 cfs 0.043 af

Subcatchment C:

Runoff Area=1,809.000 ac Runoff Depth=0.00"

Flow Length=5,330' Slope=0.0150 '/' Tc=271.6 min CN=42 Runoff=0.00 cfs 0.000 af

Pond 1P:Peak Elev=1,135.20' Storage=289.448 af Inflow=4,406.56 cfs 304.118 af
Outflow=15.93 cfs 156.604 af**Pond 2P:**Peak Elev=1,126.24' Storage=204.374 af Inflow=3,148.15 cfs 378.425 af
Outflow=34.10 cfs 291.540 af**Pond 3P:**Peak Elev=1,122.26' Storage=232.343 af Inflow=3,076.78 cfs 478.562 af
Outflow=21.28 cfs 292.761 af**Total Runoff Area = 12,065.000 ac Runoff Volume = 712.961 af Average Runoff Depth = 0.71"****71.44% Pervious Area = 8,619.000 ac 28.56% Impervious Area = 3,446.000 ac**

Barnes - Existing

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Type II 24-hr 2-YR Rainfall=2.60"

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Subcatchment 1S: UPPER EAU CLAIRE

Runoff = 4,406.56 cfs @ 12.03 hrs, Volume= 304.118 af, Depth= 2.48"

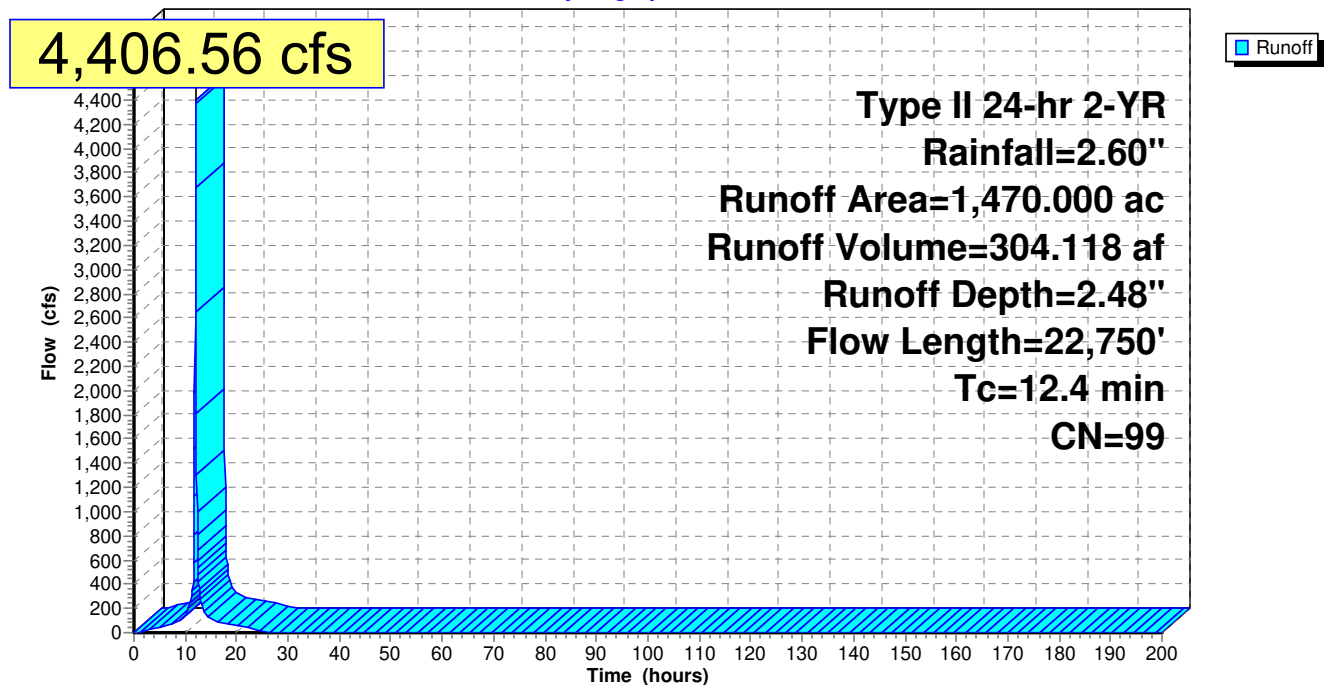
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
1,470.000	99	
1,470.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	22,750		30.56		Lake or Reservoir, Mean Depth= 29.00'

Subcatchment 1S: UPPER EAU CLAIRE

Hydrograph



Barnes - Existing

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Type II 24-hr 2-YR Rainfall=2.60"

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Subcatchment 3S: MIDDLE EAU CLAIRE

Runoff = 3,142.29 cfs @ 12.04 hrs, Volume= 221.778 af, Depth= 2.48"

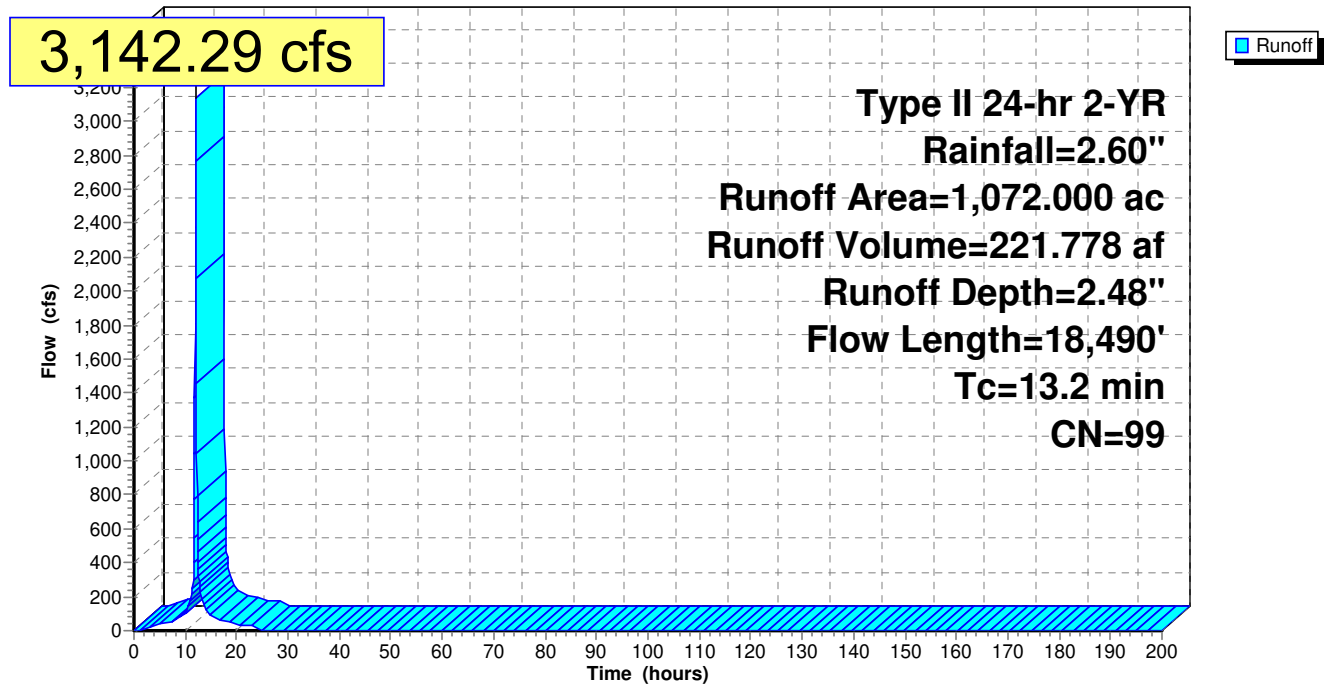
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
1,072.000	99	
1,072.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	18,490		23.40		Lake or Reservoir, Mean Depth= 17.00'

Subcatchment 3S: MIDDLE EAU CLAIRE

Hydrograph



Barnes - Existing

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Type II 24-hr 2-YR Rainfall=2.60"

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Subcatchment 5S: LOWER EAU CLAIRE

Runoff = 3,066.39 cfs @ 11.99 hrs, Volume= 187.022 af, Depth= 2.48"

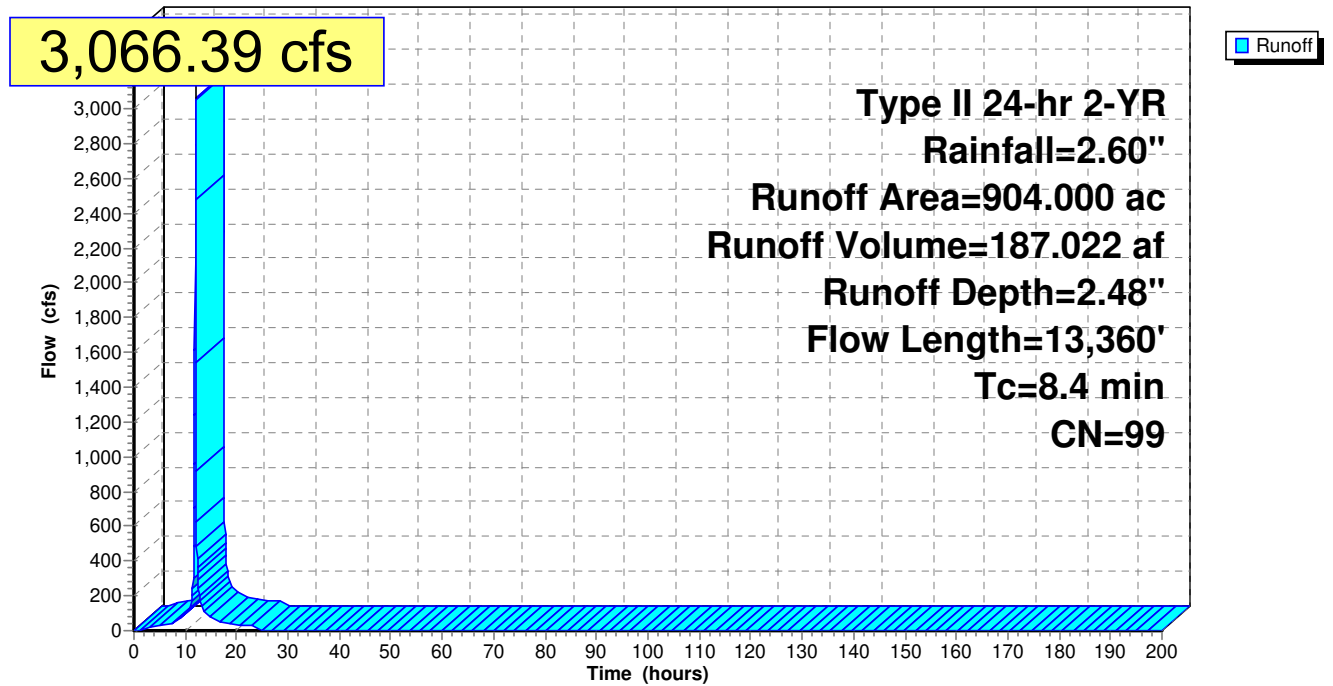
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
904.000	99	
904.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	13,360		26.62		Lake or Reservoir, Mean Depth= 22.00'

Subcatchment 5S: LOWER EAU CLAIRE

Hydrograph



Barnes - Existing

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Type II 24-hr 2-YR Rainfall=2.60"

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Subcatchment A:

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

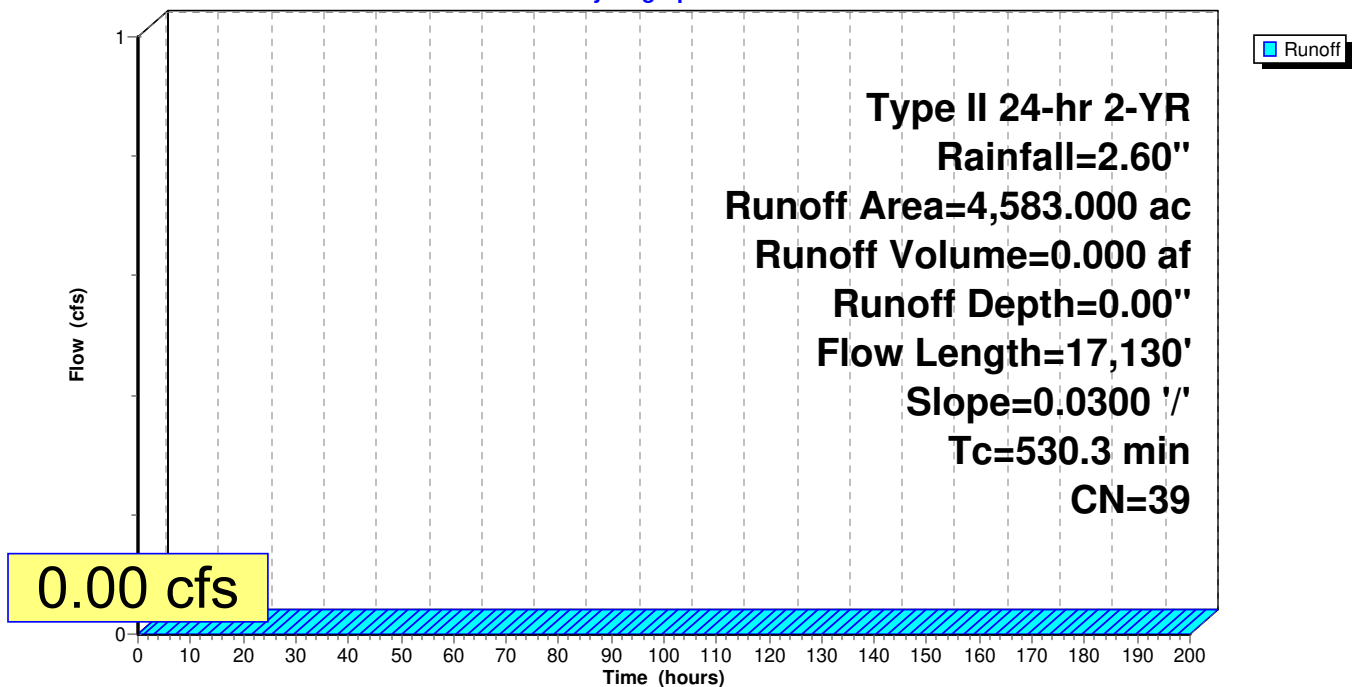
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
4,583.000	39	
4,583.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
530.3	17,130	0.0300	0.54		Lag/CN Method,

Subcatchment A:

Hydrograph



Barnes - Existing

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Type II 24-hr 2-YR Rainfall=2.60"

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Subcatchment B:

Runoff = 0.17 cfs @ 25.77 hrs, Volume= 0.043 af, Depth= 0.00"

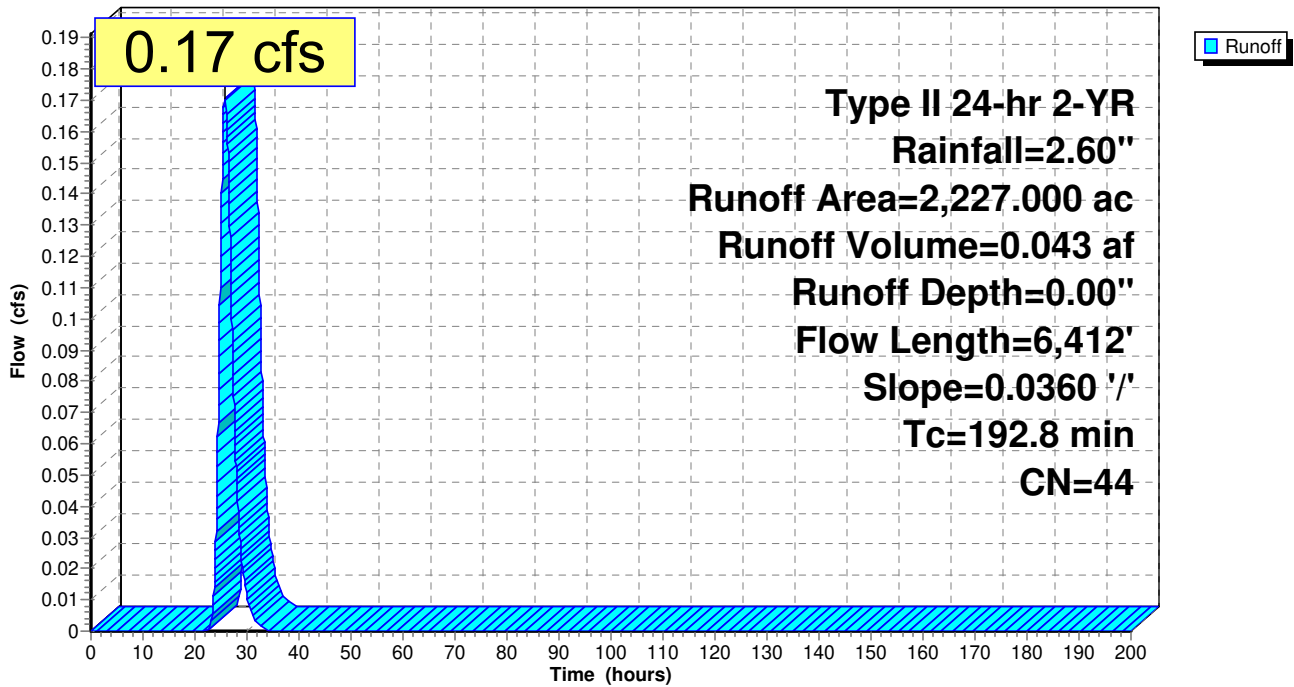
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
2,227.000	44	
2,227.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
192.8	6,412	0.0360	0.55		Lag/CN Method,

Subcatchment B:

Hydrograph



Barnes - Existing

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Type II 24-hr 2-YR Rainfall=2.60"

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Subcatchment C:

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

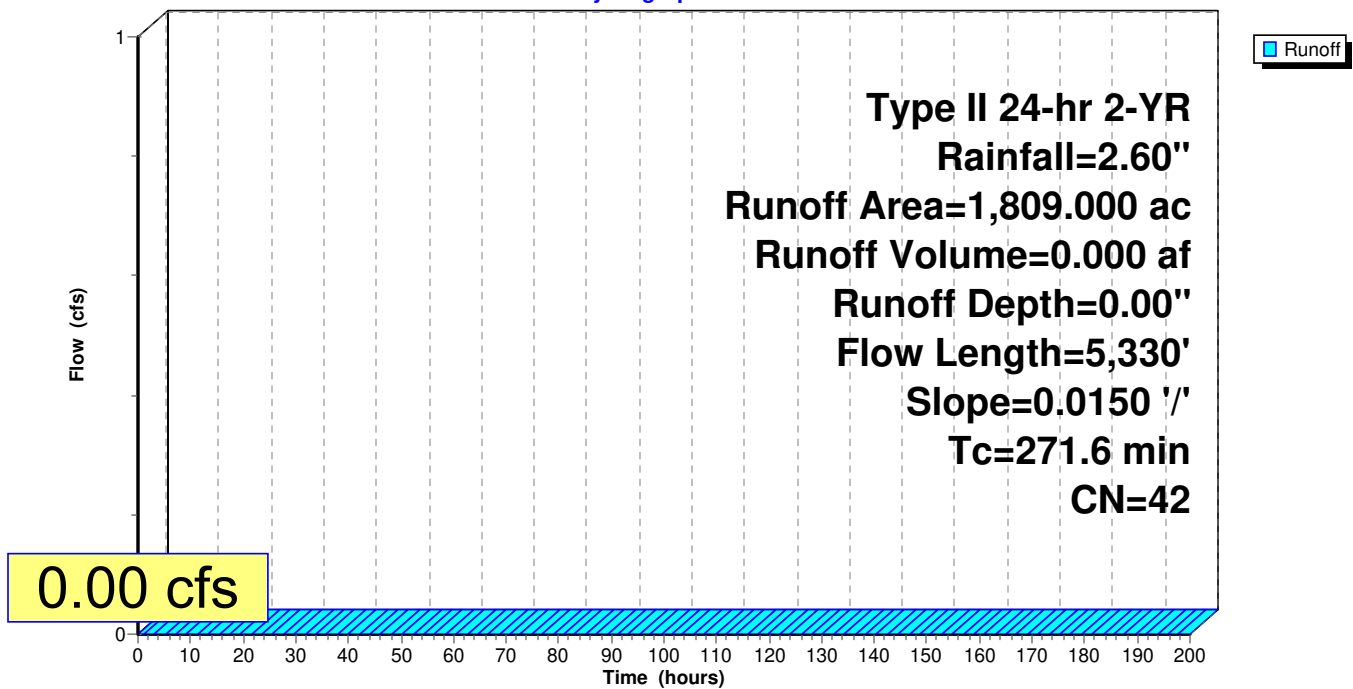
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
1,809.000	42	
1,809.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
271.6	5,330	0.0150	0.33		Lag/CN Method,

Subcatchment C:

Hydrograph



Barnes - Existing

Type II 24-hr 2-YR Rainfall=2.60"

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Pond 1P:

Inflow Area = 6,053.000 ac, Inflow Depth = 0.60" for 2-YR event
 Inflow = 4,406.56 cfs @ 12.03 hrs, Volume= 304.118 af
 Outflow = 15.93 cfs @ 24.21 hrs, Volume= 156.604 af, Atten= 100%, Lag= 730.3 min
 Primary = 15.93 cfs @ 24.21 hrs, Volume= 156.604 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,135.20' @ 24.21 hrs Surf.Area= 1,432.326 ac Storage= 289.448 af

Plug-Flow detention time= 4,787.3 min calculated for 156.604 af (51% of inflow)
 Center-of-Mass det. time= 4,660.1 min (5,409.1 - 749.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,135.00'	4,554.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,135.00	1,423.000	0.000	0.000
1,136.00	1,469.000	1,446.000	1,446.000
1,138.00	1,639.000	3,108.000	4,554.000

Device	Routing	Invert	Outlet Devices
#1	Primary	1,135.00'	65.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.90 cfs @ 24.21 hrs HW=1,135.20' (Free Discharge)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 15.90 cfs @ 1.21 fps)

Barnes - Existing

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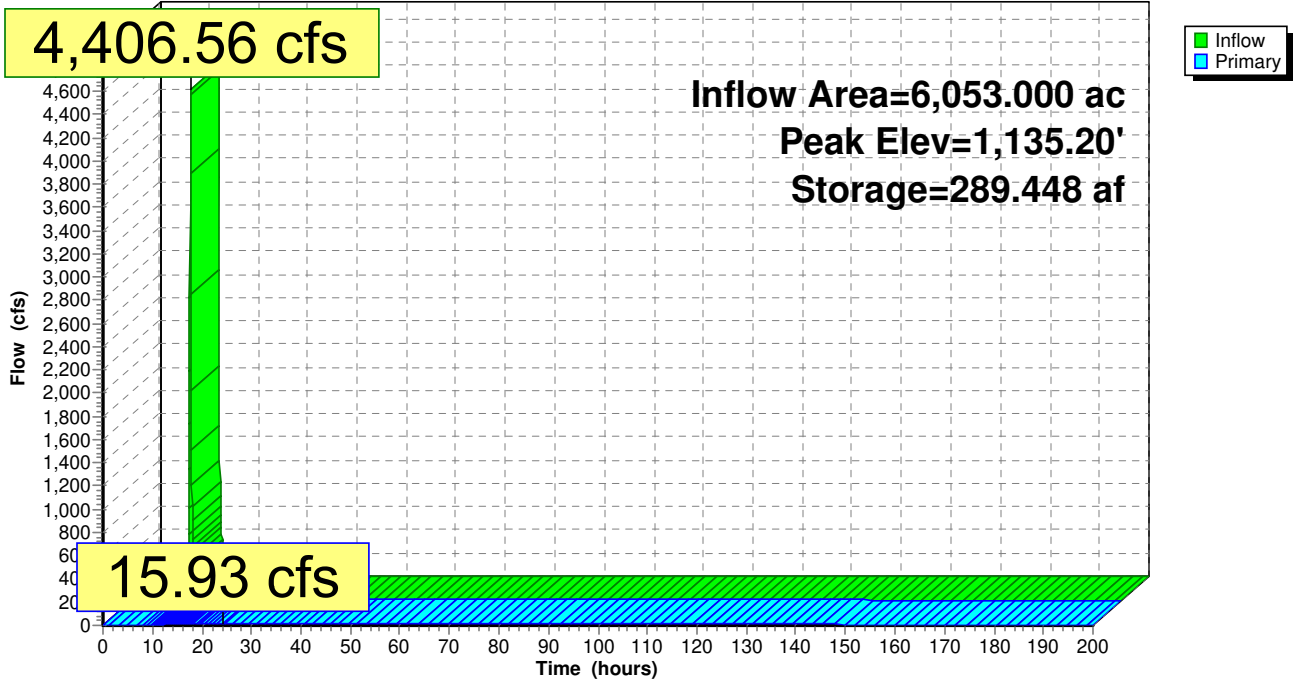
Type II 24-hr 2-YR Rainfall=2.60"

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Pond 1P:

Hydrograph



Barnes - Existing

Type II 24-hr 2-YR Rainfall=2.60"

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Pond 2P:

Inflow Area = 9,352.000 ac, Inflow Depth > 0.49" for 2-YR event
 Inflow = 3,148.15 cfs @ 12.04 hrs, Volume= 378.425 af
 Outflow = 34.10 cfs @ 24.17 hrs, Volume= 291.540 af, Atten= 99%, Lag= 727.6 min
 Primary = 34.10 cfs @ 24.17 hrs, Volume= 291.540 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,126.24' @ 24.17 hrs Surf.Area= 866.297 ac Storage= 204.374 af

Plug-Flow detention time= 3,969.0 min calculated for 291.467 af (77% of inflow)
 Center-of-Mass det. time= 2,455.2 min (5,133.2 - 2,678.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,126.00'	1,786.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)
#2	1,127.00'	597.500 af	Custom Stage Data (Prismatic) Listed below (Recalc)
		2,383.500 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,126.00	858.000	0.000	0.000
1,128.00	928.000	1,786.000	1,786.000

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,127.00	192.000	0.000	0.000
1,128.00	197.000	194.500	194.500
1,130.00	206.000	403.000	597.500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,126.00'	110.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=34.07 cfs @ 24.17 hrs HW=1,126.24' (Free Discharge)
 ←1=Broad-Crested Rectangular Weir (Weir Controls 34.07 cfs @ 1.31 fps)

Barnes - Existing

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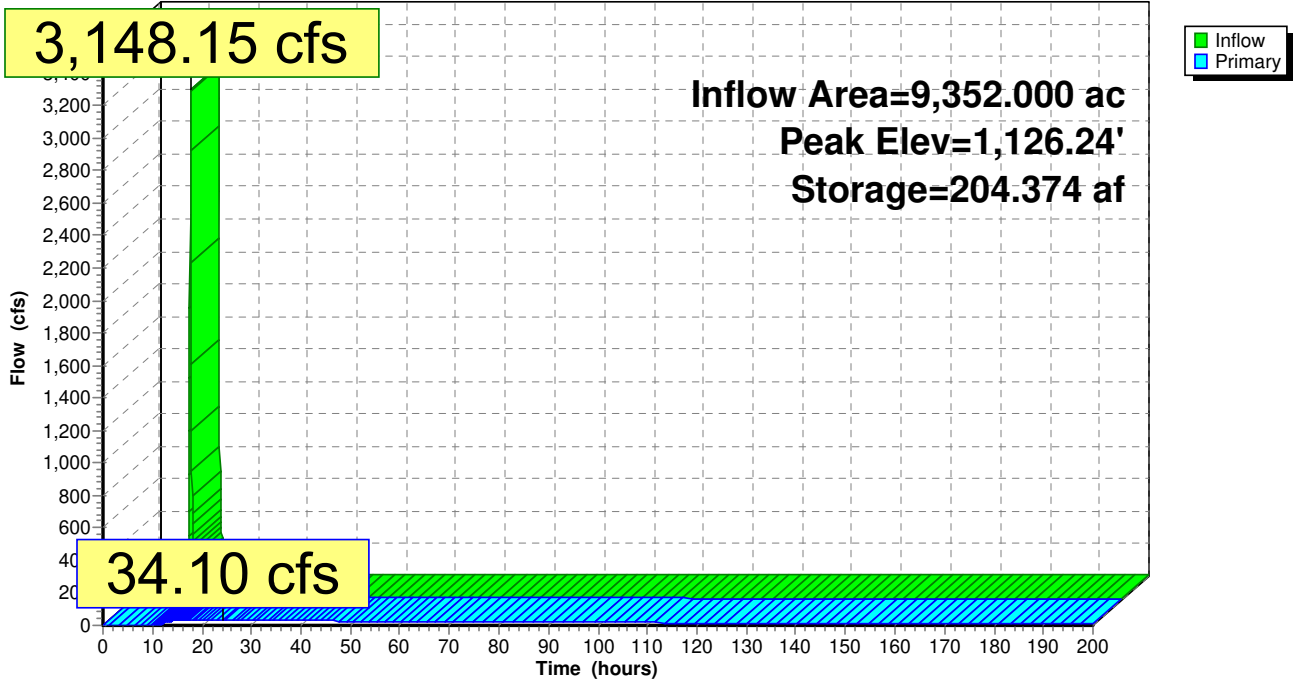
Type II 24-hr 2-YR Rainfall=2.60"

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Pond 2P:

Hydrograph



Barnes - Existing

Type II 24-hr 2-YR Rainfall=2.60"

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Pond 3P:

Inflow Area = 12,065.000 ac, Inflow Depth > 0.48" for 2-YR event
 Inflow = 3,076.78 cfs @ 11.99 hrs, Volume= 478.562 af
 Outflow = 21.28 cfs @ 74.82 hrs, Volume= 292.761 af, Atten= 99%, Lag= 3,769.9 min
 Primary = 21.28 cfs @ 74.82 hrs, Volume= 292.761 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,122.26' @ 74.82 hrs Surf.Area= 900.297 ac Storage= 232.343 af

Plug-Flow detention time= 5,056.0 min calculated for 292.688 af (61% of inflow)
 Center-of-Mass det. time= 2,818.7 min (6,237.2 - 3,418.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,122.00'	1,848.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,122.00	892.000	0.000	0.000
1,124.00	956.000	1,848.000	1,848.000

Device	Routing	Invert	Outlet Devices
#1	Primary	1,122.00'	60.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.28 cfs @ 74.82 hrs HW=1,122.26' (Free Discharge)

↑1=**Broad-Crested Rectangular Weir** (Weir Controls 21.28 cfs @ 1.37 fps)

Barnes - Existing

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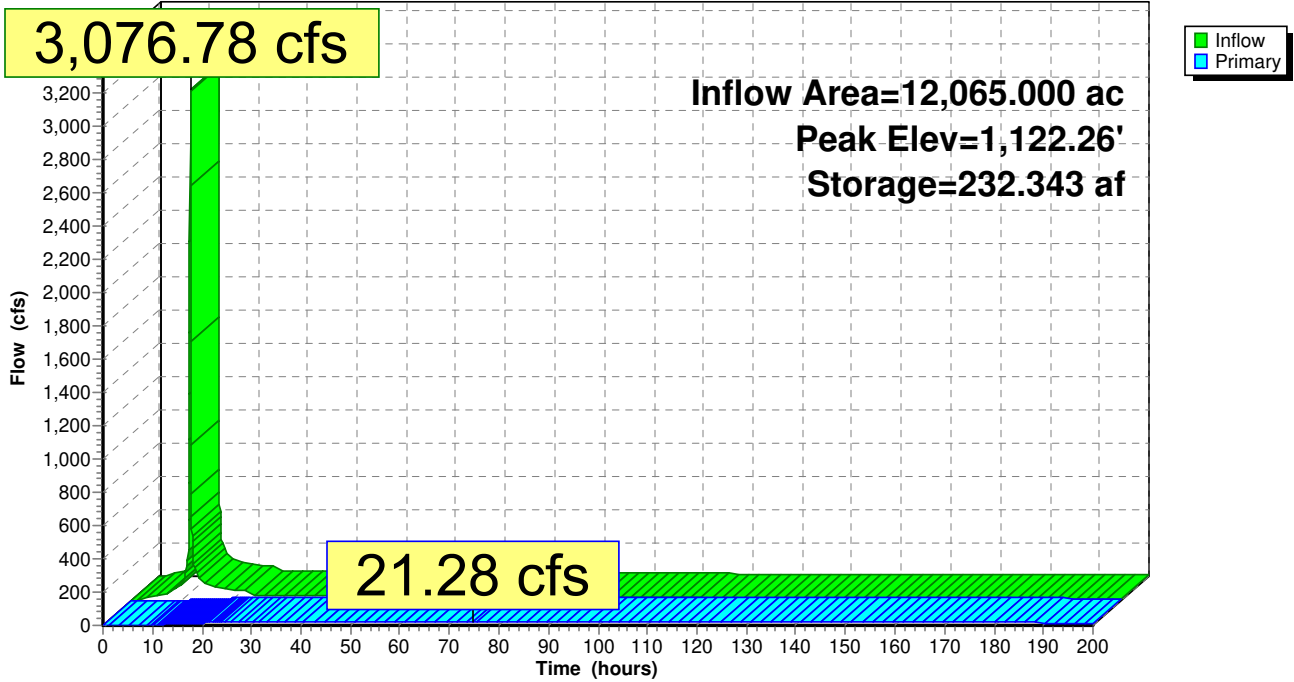
Type II 24-hr 2-YR Rainfall=2.60"

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Pond 3P:

Hydrograph



Barnes - Existing

Type II 24-hr 10-YR Rainfall=3.90"

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Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: UPPER EAU CLAIRE Runoff Area=1,470.000 ac Runoff Depth=3.78"
Flow Length=22,750' Tc=12.4 min CN=99 Runoff=6,629.15 cfs 463.215 af

Subcatchment 3S: MIDDLE EAU CLAIRE Runoff Area=1,072.000 ac Runoff Depth=3.78"
Flow Length=18,490' Tc=13.2 min CN=99 Runoff=4,727.38 cfs 337.801 af

Subcatchment 5S: LOWER EAU CLAIRE Runoff Area=904.000 ac Runoff Depth=3.78"
Flow Length=13,360' Tc=8.4 min CN=99 Runoff=4,612.22 cfs 284.862 af

Subcatchment A: Runoff Area=4,583.000 ac Runoff Depth=0.04"
Flow Length=17,130' Slope=0.0300 '/' Tc=530.3 min CN=39 Runoff=14.64 cfs 13.861 af

Subcatchment B: Runoff Area=2,227.000 ac Runoff Depth=0.13"
Flow Length=6,412' Slope=0.0360 '/' Tc=192.8 min CN=44 Runoff=28.66 cfs 24.181 af

Subcatchment C: Runoff Area=1,809.000 ac Runoff Depth=0.09"
Flow Length=5,330' Slope=0.0150 '/' Tc=271.6 min CN=42 Runoff=14.11 cfs 13.063 af

Pond 1P: Peak Elev=1,135.31' Storage=439.430 af Inflow=6,629.15 cfs 477.076 af
Outflow=29.81 cfs 276.678 af

Pond 2P: Peak Elev=1,126.37' Storage=323.242 af Inflow=4,738.55 cfs 638.660 af
Outflow=67.90 cfs 521.293 af

Pond 3P: Peak Elev=1,122.41' Storage=372.840 af Inflow=4,632.06 cfs 819.218 af
Outflow=43.30 cfs 558.209 af

Total Runoff Area = 12,065.000 ac Runoff Volume = 1,136.982 af Average Runoff Depth = 1.13"
71.44% Pervious Area = 8,619.000 ac 28.56% Impervious Area = 3,446.000 ac

Barnes - Existing

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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment 1S: UPPER EAU CLAIRE

Runoff = 6,629.15 cfs @ 12.03 hrs, Volume= 463.215 af, Depth= 3.78"

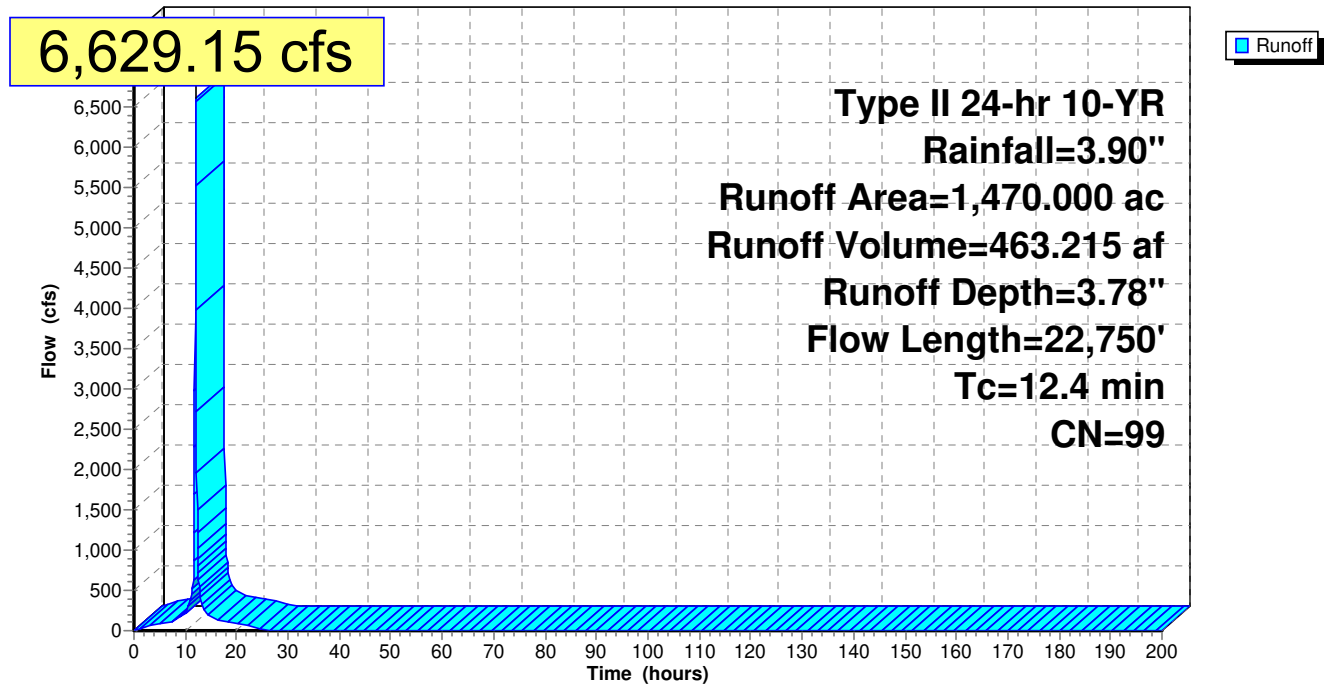
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
1,470.000	99	
1,470.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	22,750		30.56		Lake or Reservoir, Mean Depth= 29.00'

Subcatchment 1S: UPPER EAU CLAIRE

Hydrograph



Barnes - Existing

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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment 3S: MIDDLE EAU CLAIRE

Runoff = 4,727.38 cfs @ 12.04 hrs, Volume= 337.801 af, Depth= 3.78"

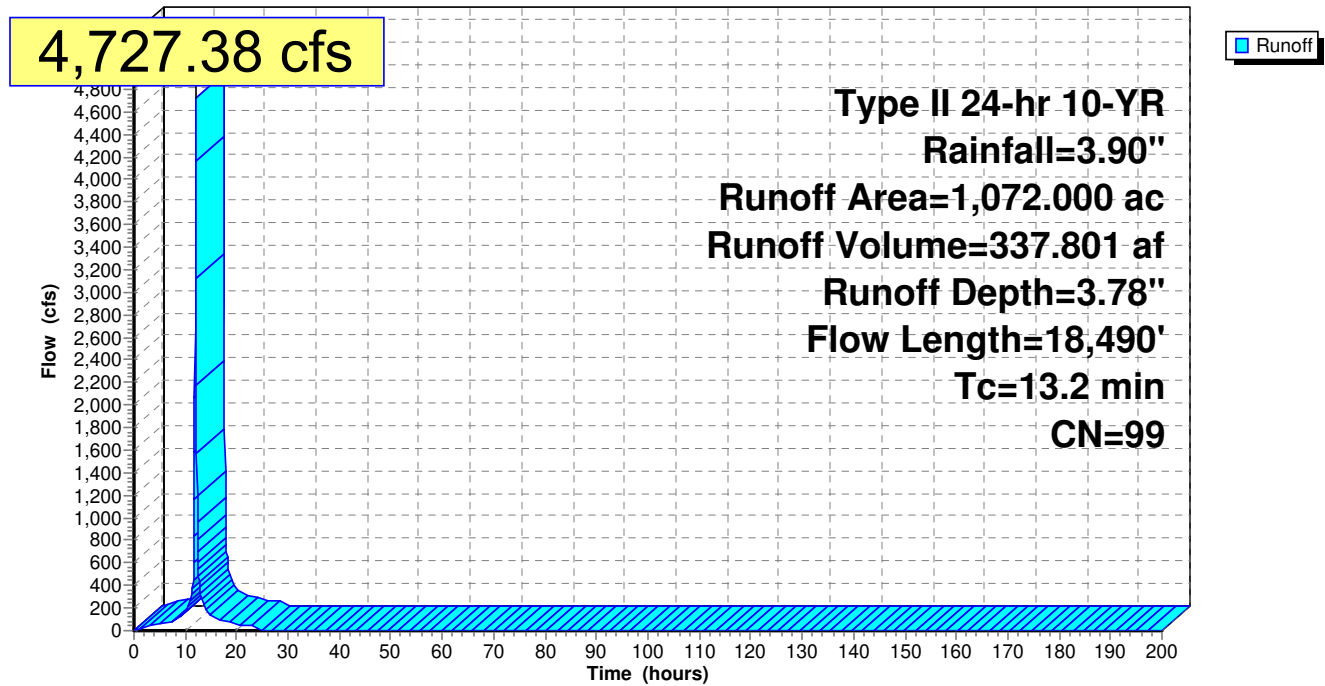
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
1,072.000	99	
1,072.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	18,490		23.40		Lake or Reservoir, Mean Depth= 17.00'

Subcatchment 3S: MIDDLE EAU CLAIRE

Hydrograph



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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment 5S: LOWER EAU CLAIRE

Runoff = 4,612.22 cfs @ 11.99 hrs, Volume= 284.862 af, Depth= 3.78"

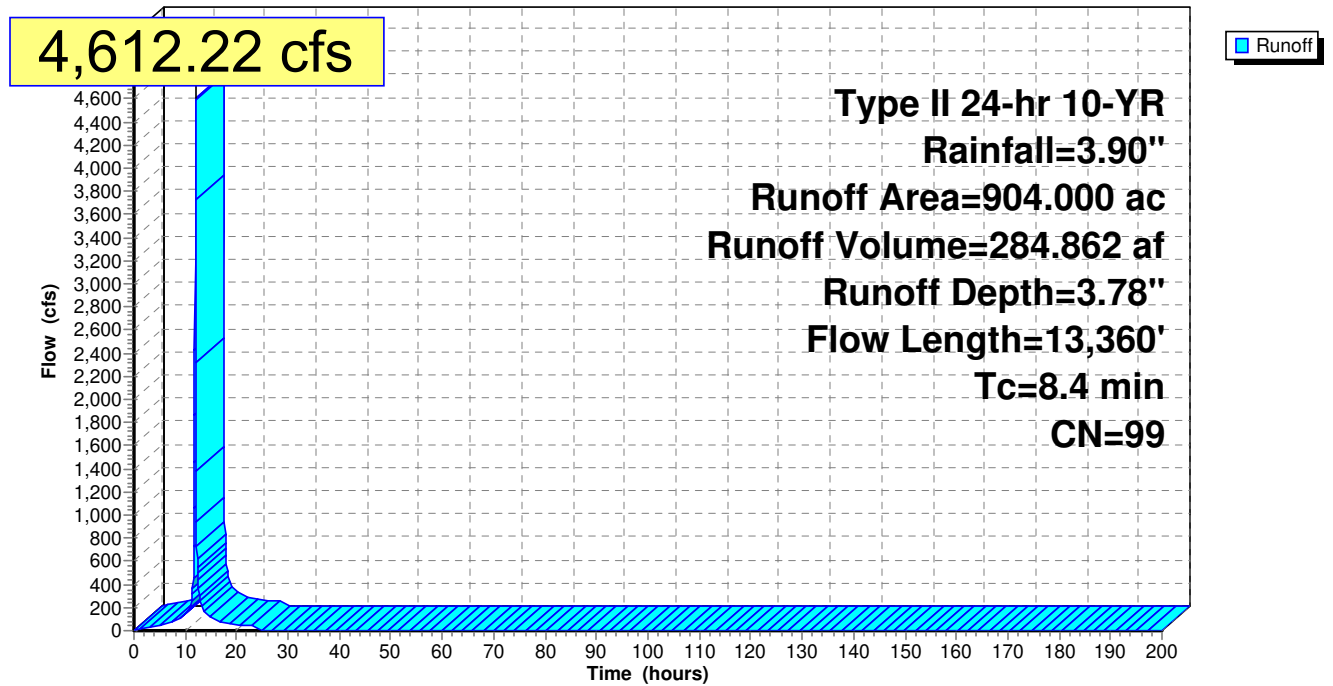
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
904.000	99	
904.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	13,360		26.62		Lake or Reservoir, Mean Depth= 22.00'

Subcatchment 5S: LOWER EAU CLAIRE

Hydrograph



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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment A:

Runoff = 14.64 cfs @ 26.57 hrs, Volume= 13.861 af, Depth= 0.04"

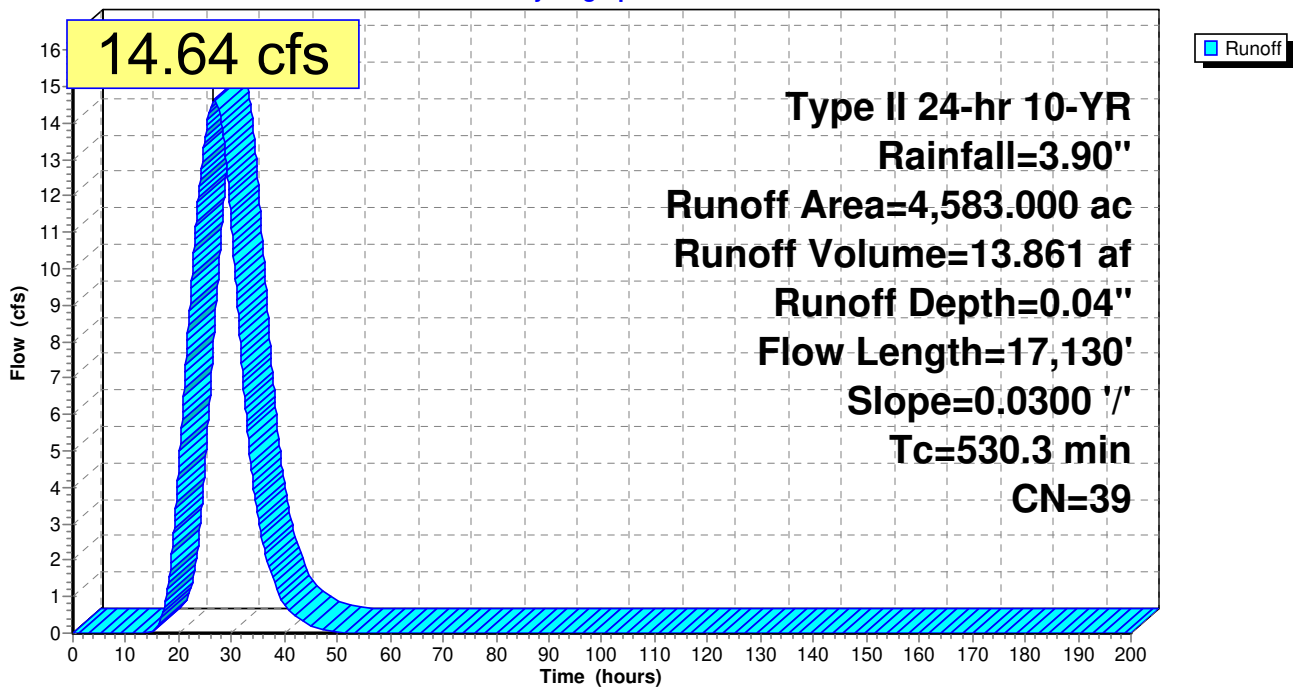
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
4,583.000	39	
4,583.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
530.3	17,130	0.0300	0.54		Lag/CN Method,

Subcatchment A:

Hydrograph



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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment B:

Runoff = 28.66 cfs @ 16.91 hrs, Volume= 24.181 af, Depth= 0.13"

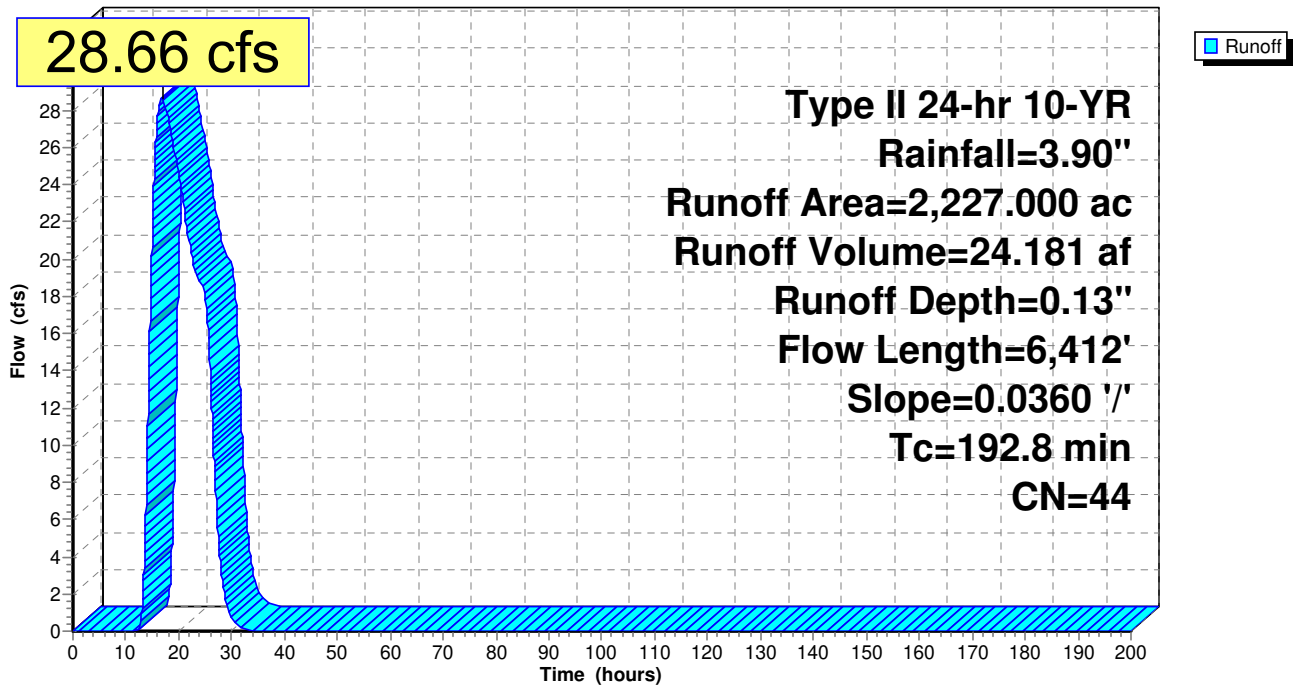
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
2,227.000	44	
2,227.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
192.8	6,412	0.0360	0.55		Lag/CN Method,

Subcatchment B:

Hydrograph



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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment C:

Runoff = 14.11 cfs @ 20.21 hrs, Volume= 13.063 af, Depth= 0.09"

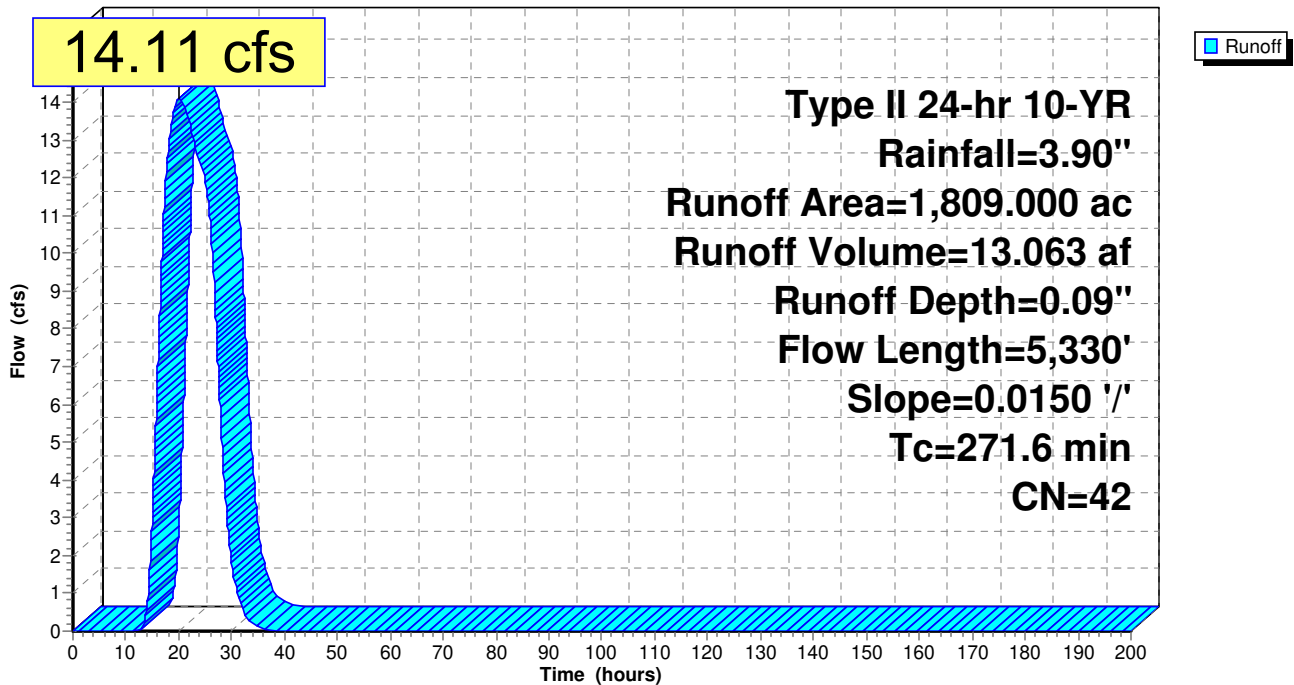
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
1,809.000	42	
1,809.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
271.6	5,330	0.0150	0.33		Lag/CN Method,

Subcatchment C:

Hydrograph



Barnes - Existing

Type II 24-hr 10-YR Rainfall=3.90"

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Pond 1P:

Inflow Area = 6,053.000 ac, Inflow Depth = 0.95" for 10-YR event
 Inflow = 6,629.15 cfs @ 12.03 hrs, Volume= 477.076 af
 Outflow = 29.81 cfs @ 24.24 hrs, Volume= 276.678 af, Atten= 100%, Lag= 732.1 min
 Primary = 29.81 cfs @ 24.24 hrs, Volume= 276.678 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,135.31' @ 24.24 hrs Surf.Area= 1,437.135 ac Storage= 439.430 af

Plug-Flow detention time= 4,600.4 min calculated for 276.609 af (58% of inflow)
 Center-of-Mass det. time= 4,460.9 min (5,230.2 - 769.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,135.00'	4,554.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,135.00	1,423.000	0.000	0.000
1,136.00	1,469.000	1,446.000	1,446.000
1,138.00	1,639.000	3,108.000	4,554.000

Device	Routing	Invert	Outlet Devices
#1	Primary	1,135.00'	65.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=29.79 cfs @ 24.24 hrs HW=1,135.31' (Free Discharge)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 29.79 cfs @ 1.49 fps)

Barnes - Existing

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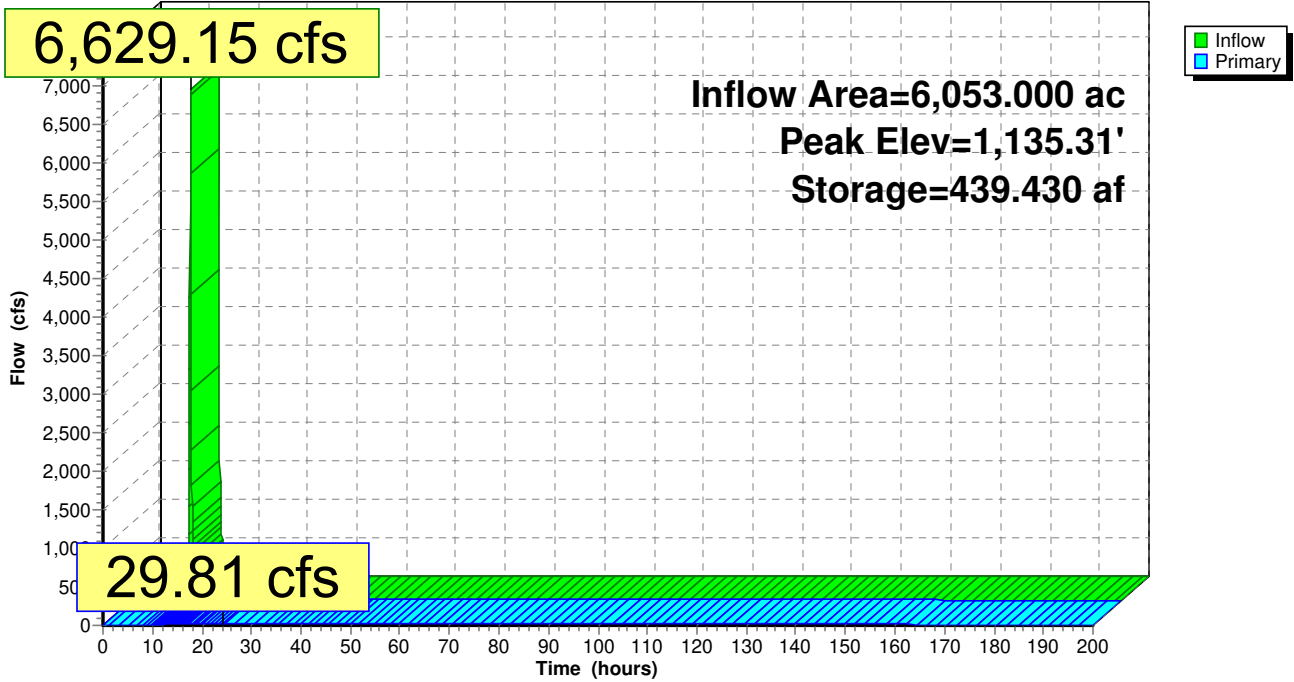
Type II 24-hr 10-YR Rainfall=3.90"

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Pond 1P:

Hydrograph



Barnes - Existing

Type II 24-hr 10-YR Rainfall=3.90"

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Pond 2P:

Inflow Area = 9,352.000 ac, Inflow Depth > 0.82" for 10-YR event
 Inflow = 4,738.55 cfs @ 12.04 hrs, Volume= 638.660 af
 Outflow = 67.90 cfs @ 24.21 hrs, Volume= 521.293 af, Atten= 99%, Lag= 730.0 min
 Primary = 67.90 cfs @ 24.21 hrs, Volume= 521.293 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,126.37' @ 24.21 hrs Surf.Area= 871.086 ac Storage= 323.242 af

Plug-Flow detention time= 3,475.6 min calculated for 521.293 af (82% of inflow)
 Center-of-Mass det. time= 2,200.7 min (4,905.7 - 2,704.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,126.00'	1,786.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)
#2	1,127.00'	597.500 af	Custom Stage Data (Prismatic) Listed below (Recalc)
		2,383.500 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,126.00	858.000	0.000	0.000
1,128.00	928.000	1,786.000	1,786.000

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,127.00	192.000	0.000	0.000
1,128.00	197.000	194.500	194.500
1,130.00	206.000	403.000	597.500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,126.00'	110.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=67.83 cfs @ 24.21 hrs HW=1,126.37' (Free Discharge)
 ←1=Broad-Crested Rectangular Weir (Weir Controls 67.83 cfs @ 1.65 fps)

Barnes - Existing

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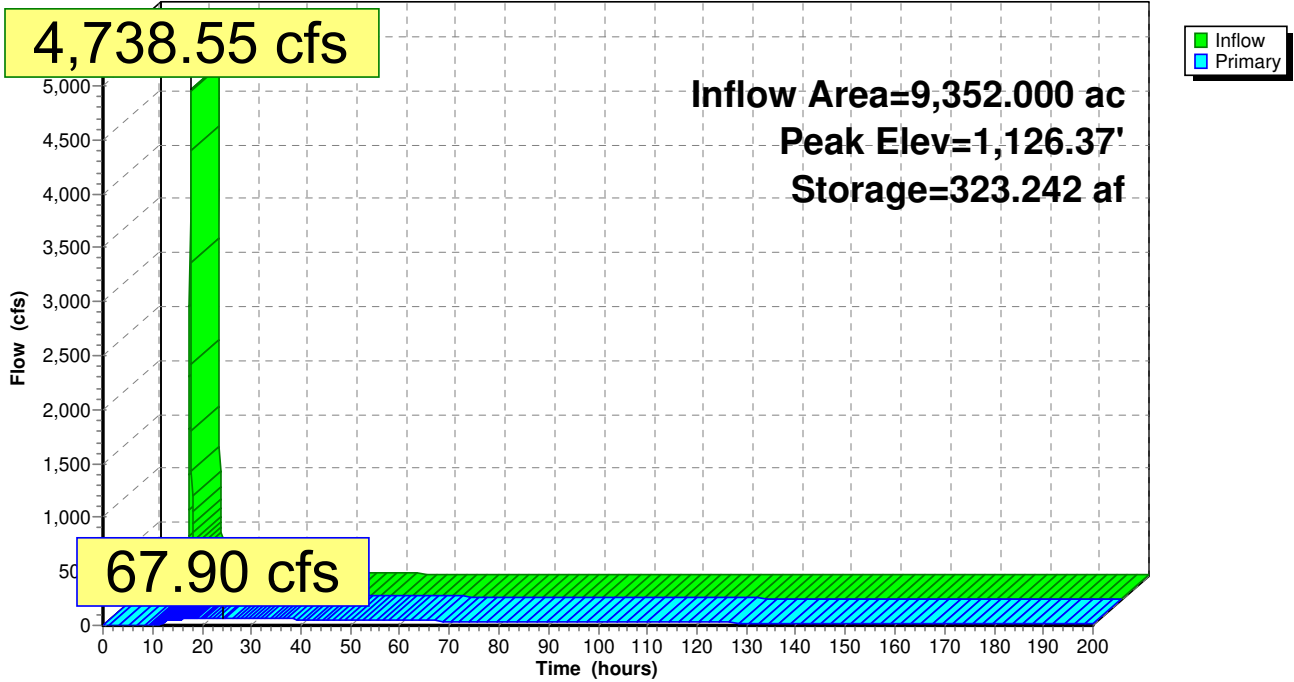
Type II 24-hr 10-YR Rainfall=3.90"

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Pond 2P:

Hydrograph



Barnes - Existing

Type II 24-hr 10-YR Rainfall=3.90"

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Pond 3P:

Inflow Area = 12,065.000 ac, Inflow Depth > 0.81" for 10-YR event
 Inflow = 4,632.06 cfs @ 11.99 hrs, Volume= 819.218 af
 Outflow = 43.30 cfs @ 62.03 hrs, Volume= 558.209 af, Atten= 99%, Lag= 3,002.4 min
 Primary = 43.30 cfs @ 62.03 hrs, Volume= 558.209 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,122.41' @ 62.03 hrs Surf.Area= 905.277 ac Storage= 372.840 af

Plug-Flow detention time= 4,538.1 min calculated for 558.209 af (68% of inflow)
 Center-of-Mass det. time= 2,630.6 min (6,030.3 - 3,399.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,122.00'	1,848.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,122.00	892.000	0.000	0.000
1,124.00	956.000	1,848.000	1,848.000

Device	Routing	Invert	Outlet Devices
#1	Primary	1,122.00'	60.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=43.29 cfs @ 62.03 hrs HW=1,122.41' (Free Discharge)

↑1=**Broad-Crested Rectangular Weir** (Weir Controls 43.29 cfs @ 1.74 fps)

Barnes - Existing

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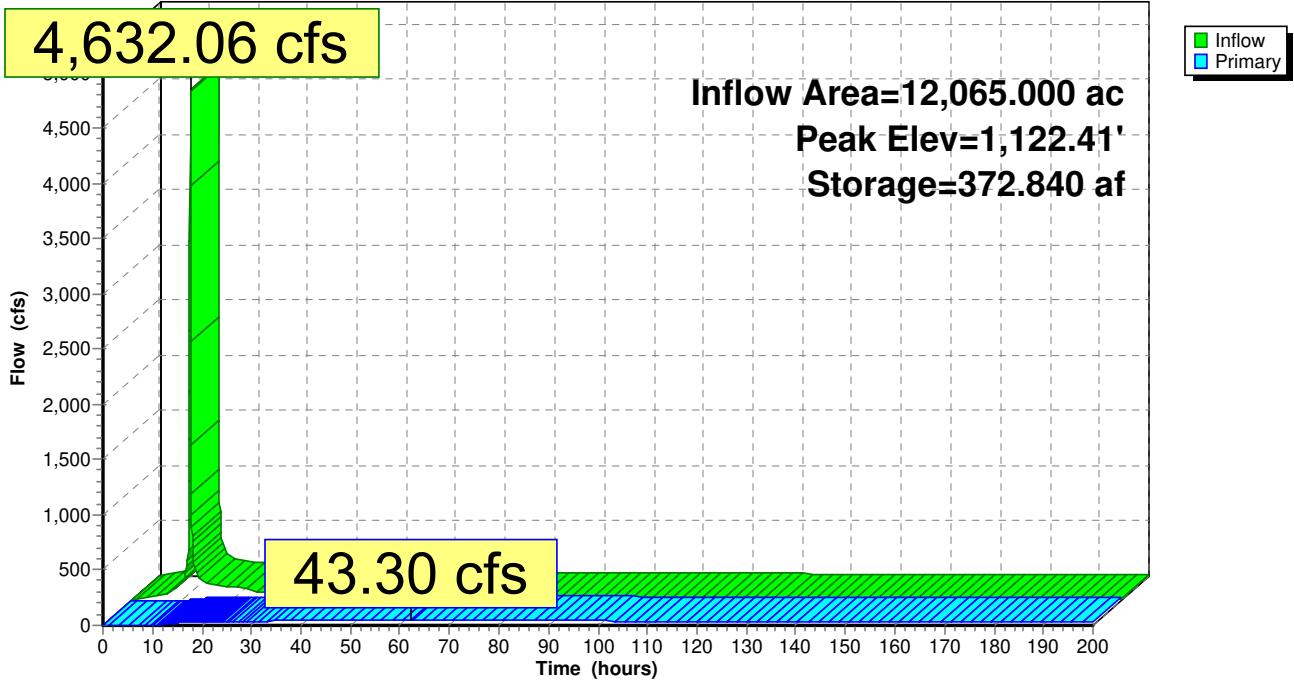
Type II 24-hr 10-YR Rainfall=3.90"

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Pond 3P:

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: UPPER EAU CLAIRE Runoff Area=1,470.000 ac Runoff Depth=5.28"
Flow Length=22,750' Tc=12.4 min CN=99 Runoff=9,189.58 cfs 646.880 af

Subcatchment 3S: MIDDLE EAU CLAIRE Runoff Area=1,072.000 ac Runoff Depth=5.28"
Flow Length=18,490' Tc=13.2 min CN=99 Runoff=6,553.38 cfs 471.738 af

Subcatchment 5S: LOWER EAU CLAIRE Runoff Area=904.000 ac Runoff Depth=5.28"
Flow Length=13,360' Tc=8.4 min CN=99 Runoff=6,393.17 cfs 397.809 af

Subcatchment A: Runoff Area=4,583.000 ac Runoff Depth=0.29"
Flow Length=17,130' Slope=0.0300 '/' Tc=530.3 min CN=39 Runoff=101.04 cfs 110.038 af

Subcatchment B: Runoff Area=2,227.000 ac Runoff Depth=0.52"
Flow Length=6,412' Slope=0.0360 '/' Tc=192.8 min CN=44 Runoff=160.67 cfs 97.050 af

Subcatchment C: Runoff Area=1,809.000 ac Runoff Depth=0.42"
Flow Length=5,330' Slope=0.0150 '/' Tc=271.6 min CN=42 Runoff=83.05 cfs 63.787 af

Pond 1P: Peak Elev=1,135.47' Storage=666.927 af Inflow=9,189.58 cfs 756.918 af
Outflow=55.70 cfs 487.800 af

Pond 2P: Peak Elev=1,126.57' Storage=492.690 af Inflow=6,572.35 cfs 1,056.588 af
Outflow=127.06 cfs 900.250 af

Pond 3P: Peak Elev=1,122.65' Storage=582.452 af Inflow=6,426.23 cfs 1,361.846 af
Outflow=83.59 cfs 1,007.214 af

Total Runoff Area = 12,065.000 ac Runoff Volume = 1,787.302 af Average Runoff Depth = 1.78"
71.44% Pervious Area = 8,619.000 ac 28.56% Impervious Area = 3,446.000 ac

Barnes - Existing

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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment 1S: UPPER EAU CLAIRE

Runoff = 9,189.58 cfs @ 12.03 hrs, Volume= 646.880 af, Depth= 5.28"

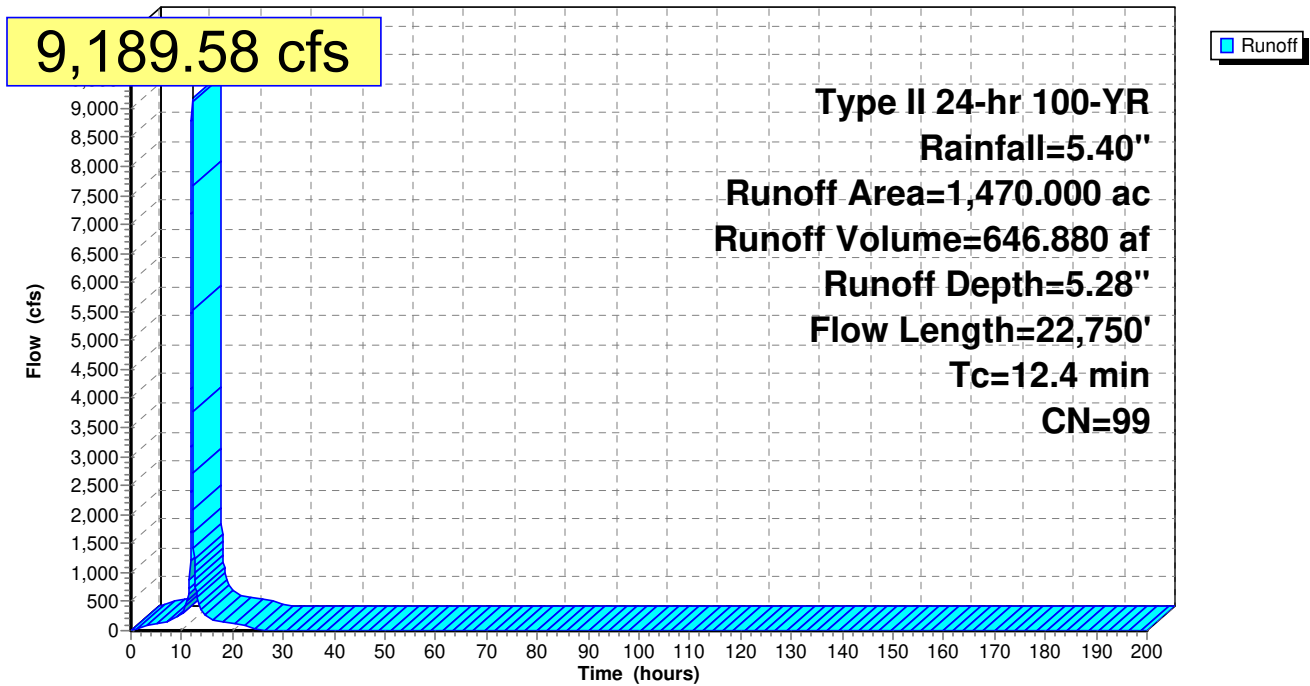
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
1,470.000	99	
1,470.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	22,750		30.56		Lake or Reservoir, Mean Depth= 29.00'

Subcatchment 1S: UPPER EAU CLAIRE

Hydrograph



Barnes - Existing

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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment 3S: MIDDLE EAU CLAIRE

Runoff = 6,553.38 cfs @ 12.04 hrs, Volume= 471.738 af, Depth= 5.28"

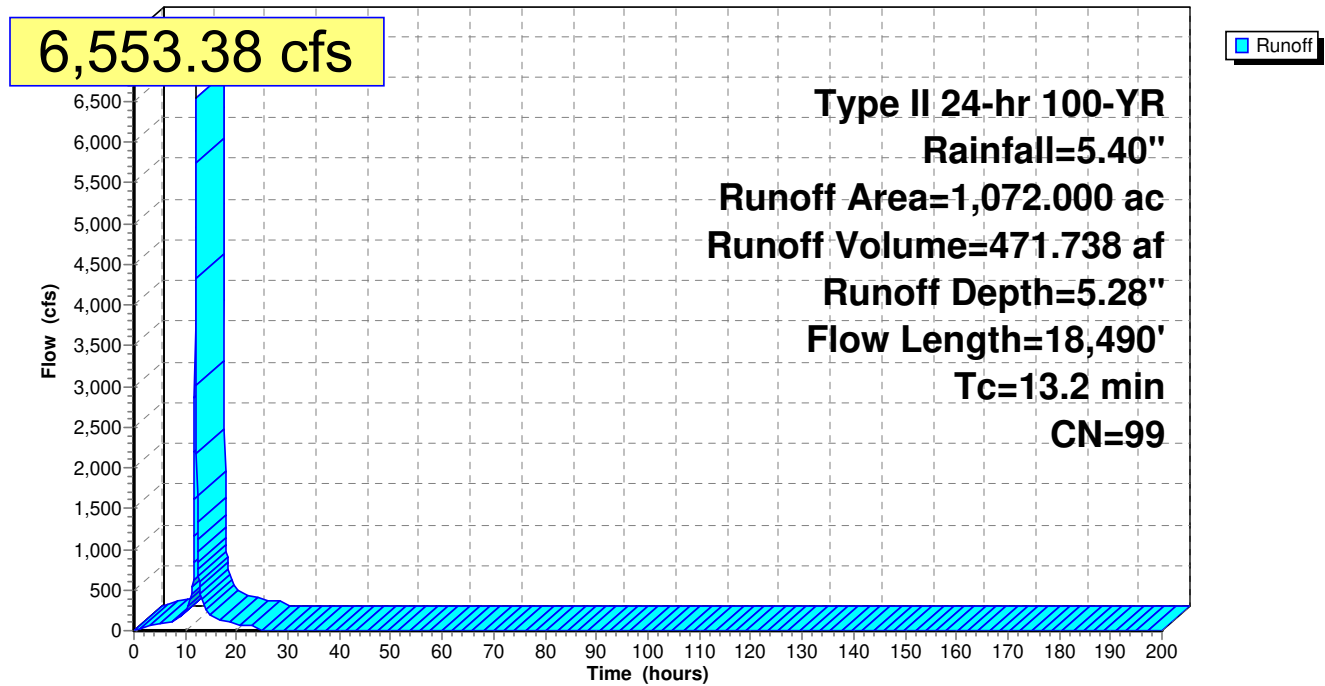
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
1,072.000	99	
1,072.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	18,490		23.40		Lake or Reservoir, Mean Depth= 17.00'

Subcatchment 3S: MIDDLE EAU CLAIRE

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment 5S: LOWER EAU CLAIRE

Runoff = 6,393.17 cfs @ 11.99 hrs, Volume= 397.809 af, Depth= 5.28"

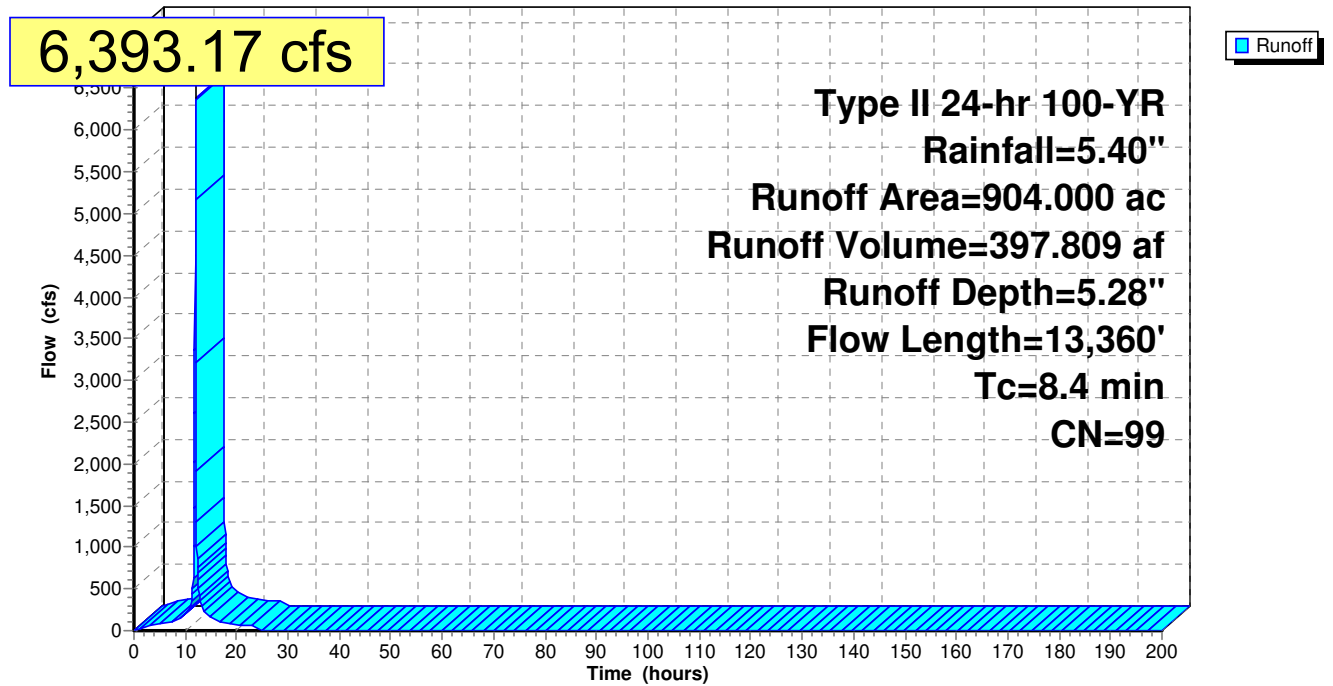
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
904.000	99	
904.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	13,360		26.62		Lake or Reservoir, Mean Depth= 22.00'

Subcatchment 5S: LOWER EAU CLAIRE

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment A:

Runoff = 101.04 cfs @ 21.80 hrs, Volume= 110.038 af, Depth= 0.29"

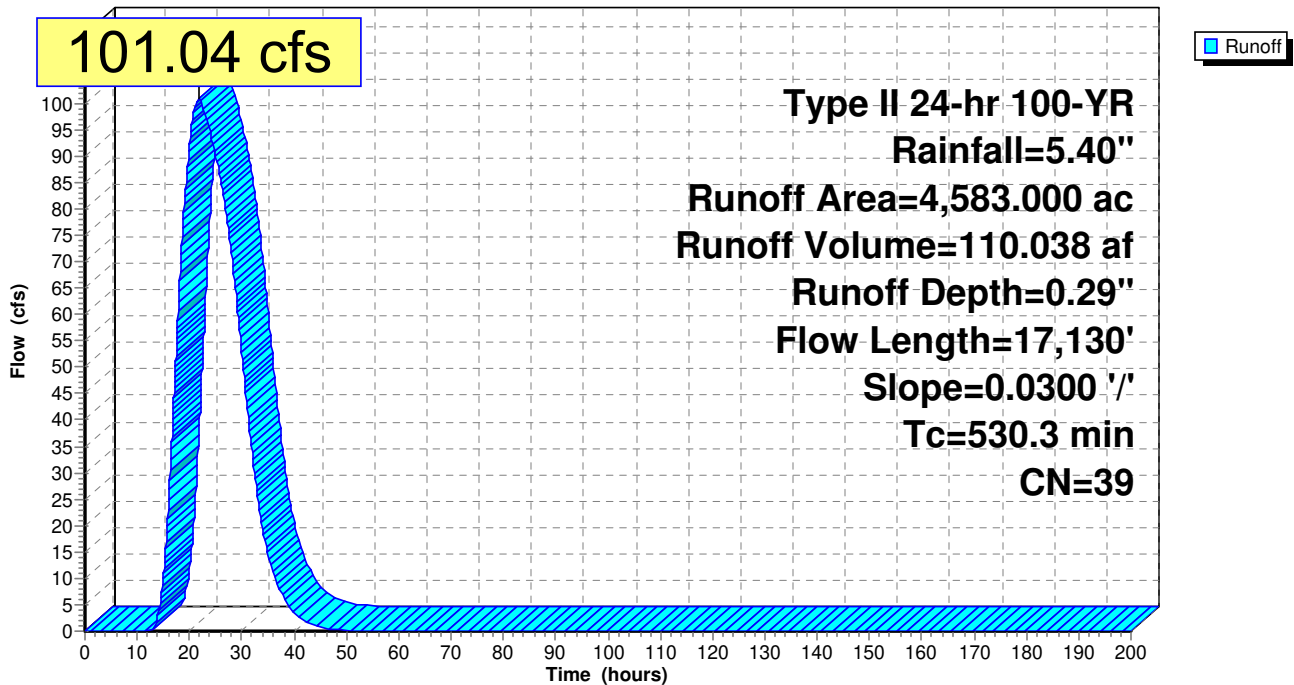
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
4,583.000	39	
4,583.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
530.3	17,130	0.0300	0.54		Lag/CN Method,

Subcatchment A:

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment B:

Runoff = 160.67 cfs @ 15.02 hrs, Volume= 97.050 af, Depth= 0.52"

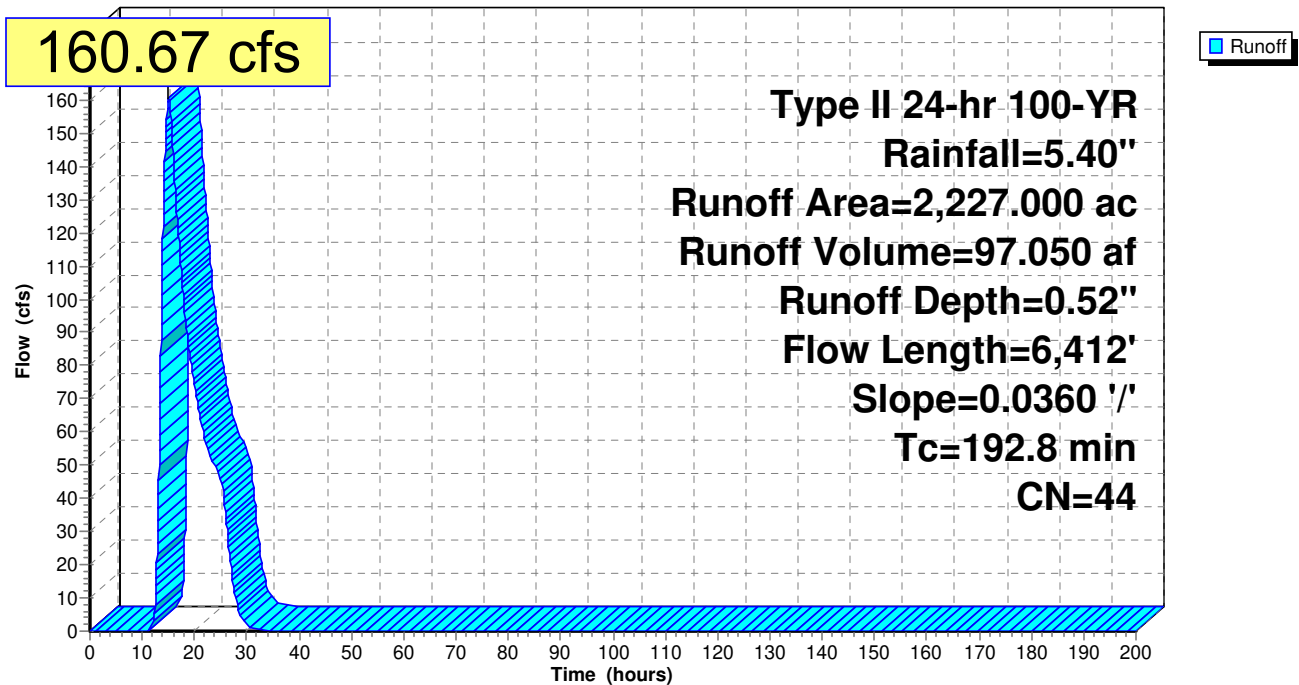
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
2,227.000	44	
2,227.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
192.8	6,412	0.0360	0.55		Lag/CN Method,

Subcatchment B:

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment C:

Runoff = 83.05 cfs @ 16.60 hrs, Volume= 63.787 af, Depth= 0.42"

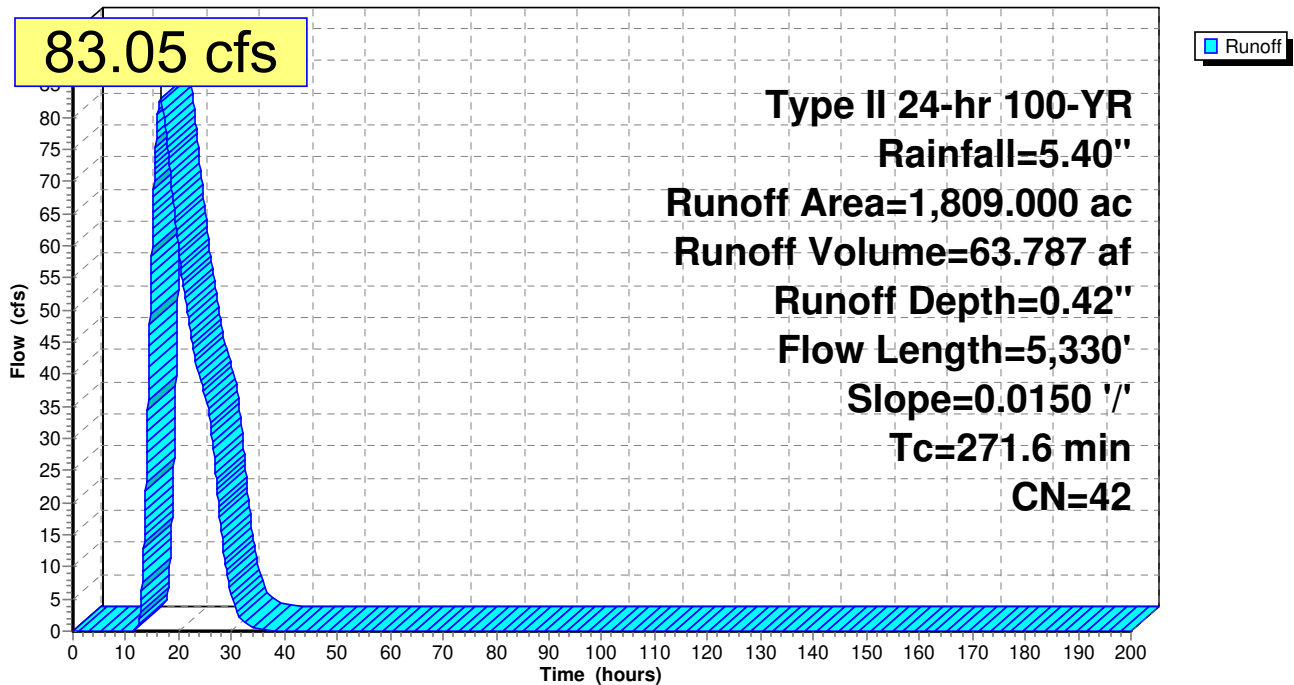
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
1,809.000	42	
1,809.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
271.6	5,330	0.0150	0.33		Lag/CN Method,

Subcatchment C:

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Pond 1P:

Inflow Area = 6,053.000 ac, Inflow Depth = 1.50" for 100-YR event

Inflow = 9,189.58 cfs @ 12.03 hrs, Volume= 756.918 af

Outflow = 55.70 cfs @ 29.69 hrs, Volume= 487.800 af, Atten= 99%, Lag= 1,059.4 min

Primary = 55.70 cfs @ 29.69 hrs, Volume= 487.800 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Peak Elev= 1,135.47' @ 29.69 hrs Surf.Area= 1,444.398 ac Storage= 666.927 af

Plug-Flow detention time= 4,422.0 min calculated for 487.800 af (64% of inflow)

Center-of-Mass det. time= 4,223.5 min (5,070.2 - 846.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,135.00'	4,554.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,135.00	1,423.000	0.000	0.000
1,136.00	1,469.000	1,446.000	1,446.000
1,138.00	1,639.000	3,108.000	4,554.000

Device	Routing	Invert	Outlet Devices
#1	Primary	1,135.00'	65.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=55.68 cfs @ 29.69 hrs HW=1,135.47' (Free Discharge)↑1=**Broad-Crested Rectangular Weir** (Weir Controls 55.68 cfs @ 1.84 fps)

Barnes - Existing

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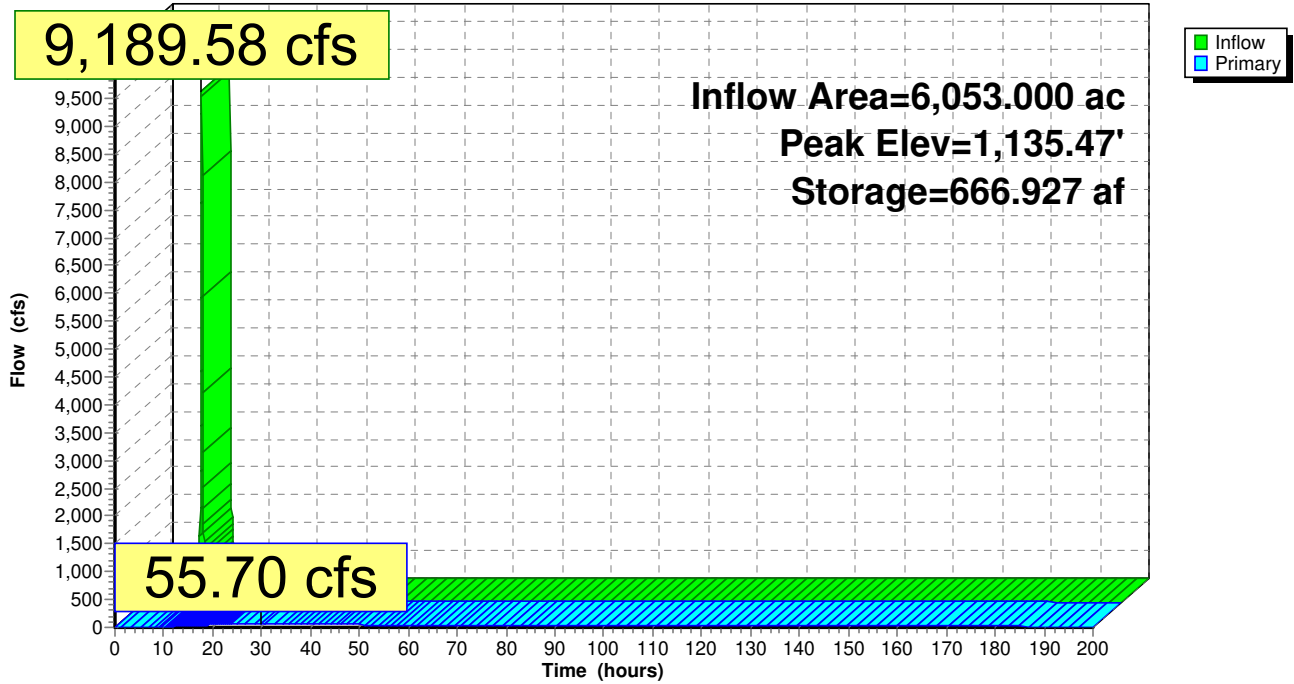
Type II 24-hr 100-YR Rainfall=5.40"

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Pond 1P:

Hydrograph



Barnes - Existing

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Type II 24-hr 100-YR Rainfall=5.40"

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Pond 2P:

Inflow Area = 9,352.000 ac, Inflow Depth > 1.36" for 100-YR event

Inflow = 6,572.35 cfs @ 12.04 hrs, Volume= 1,056.588 af

Outflow = 127.06 cfs @ 24.22 hrs, Volume= 900.250 af, Atten= 98%, Lag= 730.7 min

Primary = 127.06 cfs @ 24.22 hrs, Volume= 900.250 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Peak Elev= 1,126.57' @ 24.22 hrs Surf.Area= 877.868 ac Storage= 492.690 af

Plug-Flow detention time= 3,020.5 min calculated for 900.250 af (85% of inflow)

Center-of-Mass det. time= 1,959.7 min (4,733.0 - 2,773.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,126.00'	1,786.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)
#2	1,127.00'	597.500 af	Custom Stage Data (Prismatic) Listed below (Recalc)
		2,383.500 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,126.00	858.000	0.000	0.000
1,128.00	928.000	1,786.000	1,786.000

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,127.00	192.000	0.000	0.000
1,128.00	197.000	194.500	194.500
1,130.00	206.000	403.000	597.500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,126.00'	110.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=127.02 cfs @ 24.22 hrs HW=1,126.57' (Free Discharge)←1=**Broad-Crested Rectangular Weir** (Weir Controls 127.02 cfs @ 2.03 fps)

Barnes - Existing

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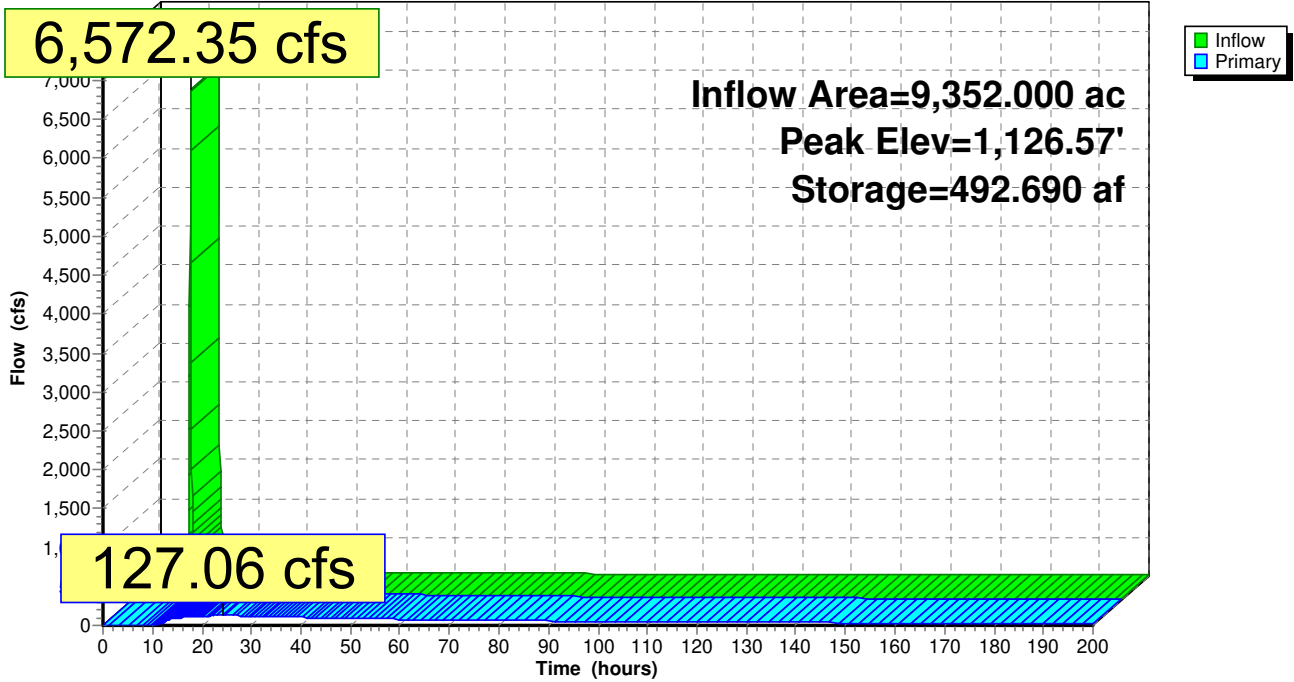
Type II 24-hr 100-YR Rainfall=5.40"

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Pond 2P:

Hydrograph



Barnes - Existing

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Type II 24-hr 100-YR Rainfall=5.40"

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Pond 3P:

Inflow Area = 12,065.000 ac, Inflow Depth > 1.35" for 100-YR event

Inflow = 6,426.23 cfs @ 11.99 hrs, Volume= 1,361.846 af

Outflow = 83.59 cfs @ 54.76 hrs, Volume= 1,007.214 af, Atten= 99%, Lag= 2,566.1 min

Primary = 83.59 cfs @ 54.76 hrs, Volume= 1,007.214 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Peak Elev= 1,122.65' @ 54.76 hrs Surf.Area= 912.656 ac Storage= 582.452 af

Plug-Flow detention time= 4,050.6 min calculated for 1,006.963 af (74% of inflow)

Center-of-Mass det. time= 2,440.4 min (5,840.4 - 3,399.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,122.00'	1,848.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,122.00	892.000	0.000	0.000
1,124.00	956.000	1,848.000	1,848.000

Device	Routing	Invert	Outlet Devices
#1	Primary	1,122.00'	60.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=83.59 cfs @ 54.76 hrs HW=1,122.65' (Free Discharge)↑1=**Broad-Crested Rectangular Weir** (Weir Controls 83.59 cfs @ 2.16 fps)

Barnes - Existing

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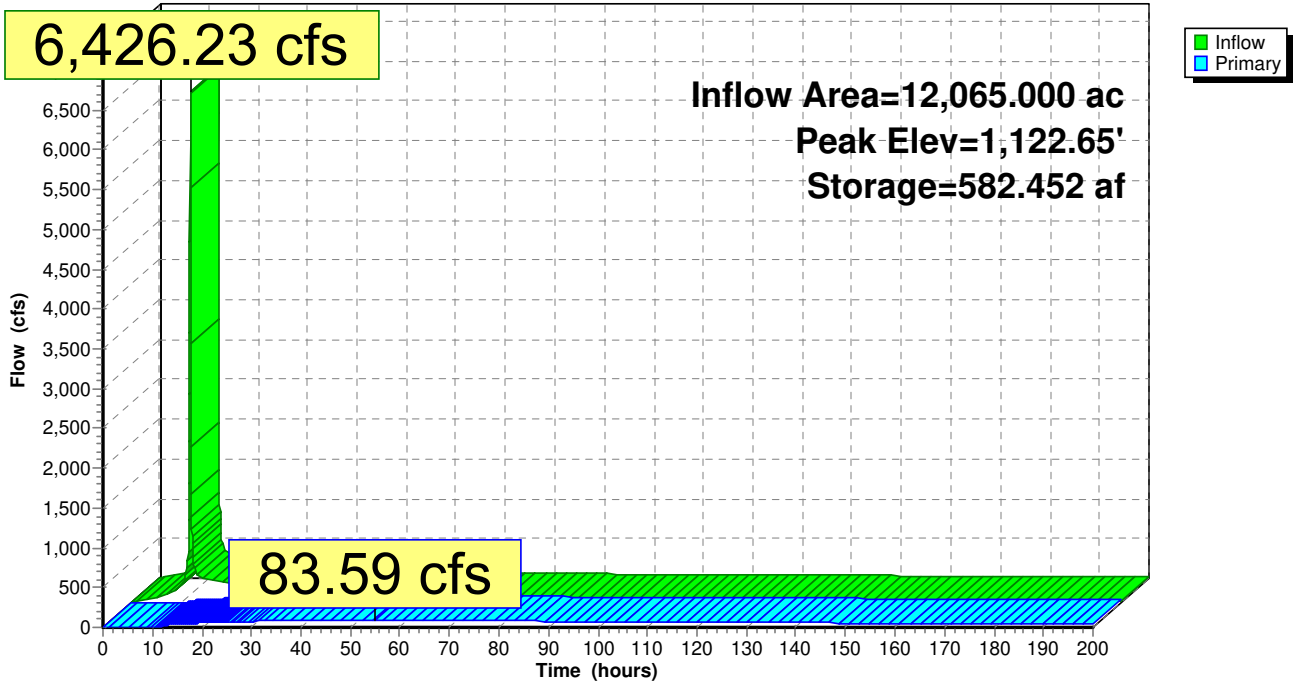
Type II 24-hr 100-YR Rainfall=5.40"

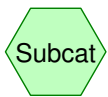
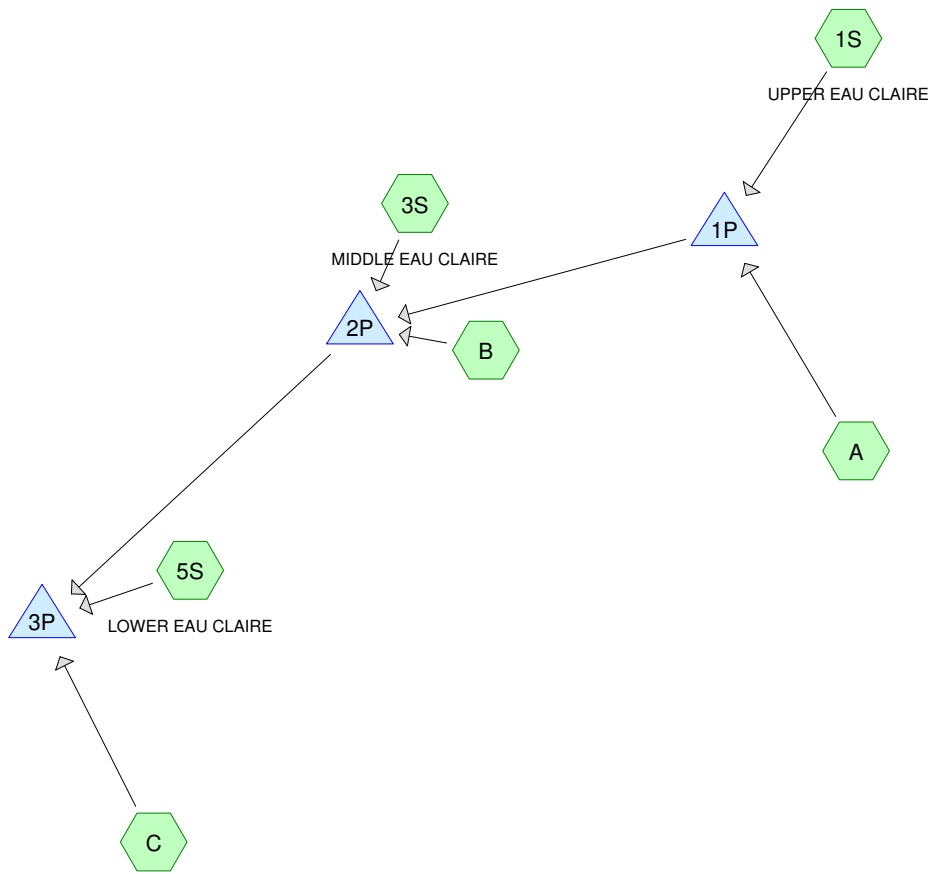
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Pond 3P:

Hydrograph

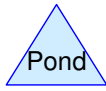




Subcat



Reach



Pond



Link

Drainage Diagram for Barnes - Future
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Barnes - Future

Area Listing (all nodes)

<u>Area (acres)</u>	<u>CN</u>	<u>Description (subcats)</u>
4,583.000	41	(A)
1,809.000	42	(C)
2,227.000	45	(B)
3,446.000	99	(1S,3S,5S)
<hr/>		
12,065.000		

Barnes - Future

Type II 24-hr 2-YR Rainfall=2.60"

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Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: UPPER EAU CLAIRE

Runoff Area=1,470.000 ac Runoff Depth=2.48"

Flow Length=22,750' Tc=12.4 min CN=99 Runoff=4,406.56 cfs 304.118 af

Subcatchment 3S: MIDDLE EAU CLAIRE

Runoff Area=1,072.000 ac Runoff Depth=2.48"

Flow Length=18,490' Tc=13.2 min CN=99 Runoff=3,142.29 cfs 221.778 af

Subcatchment 5S: LOWER EAU CLAIRE

Runoff Area=904.000 ac Runoff Depth=2.48"

Flow Length=13,360' Tc=8.4 min CN=99 Runoff=3,066.39 cfs 187.022 af

Subcatchment A:

Runoff Area=4,583.000 ac Runoff Depth=0.00"

Flow Length=17,130' Slope=0.0300 '/' Tc=502.1 min CN=41 Runoff=0.00 cfs 0.000 af

Subcatchment B:

Runoff Area=2,227.000 ac Runoff Depth=0.00"

Flow Length=6,412' Slope=0.0360 '/' Tc=187.8 min CN=45 Runoff=1.05 cfs 0.363 af

Subcatchment C:

Runoff Area=1,809.000 ac Runoff Depth=0.00"

Flow Length=5,330' Slope=0.0150 '/' Tc=271.6 min CN=42 Runoff=0.00 cfs 0.000 af

Pond 1P:

Peak Elev=1,135.20' Storage=289.448 af Inflow=4,406.56 cfs 304.118 af

Outflow=15.93 cfs 156.604 af

Pond 2P:

Peak Elev=1,126.24' Storage=204.475 af Inflow=3,148.15 cfs 378.745 af

Outflow=34.12 cfs 291.841 af

Pond 3P:

Peak Elev=1,122.26' Storage=232.486 af Inflow=3,076.78 cfs 478.863 af

Outflow=21.30 cfs 292.979 af

Total Runoff Area = 12,065.000 ac Runoff Volume = 713.281 af Average Runoff Depth = 0.71"**71.44% Pervious Area = 8,619.000 ac 28.56% Impervious Area = 3,446.000 ac**

Barnes - Future

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Type II 24-hr 2-YR Rainfall=2.60"

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Subcatchment 1S: UPPER EAU CLAIRE

Runoff = 4,406.56 cfs @ 12.03 hrs, Volume= 304.118 af, Depth= 2.48"

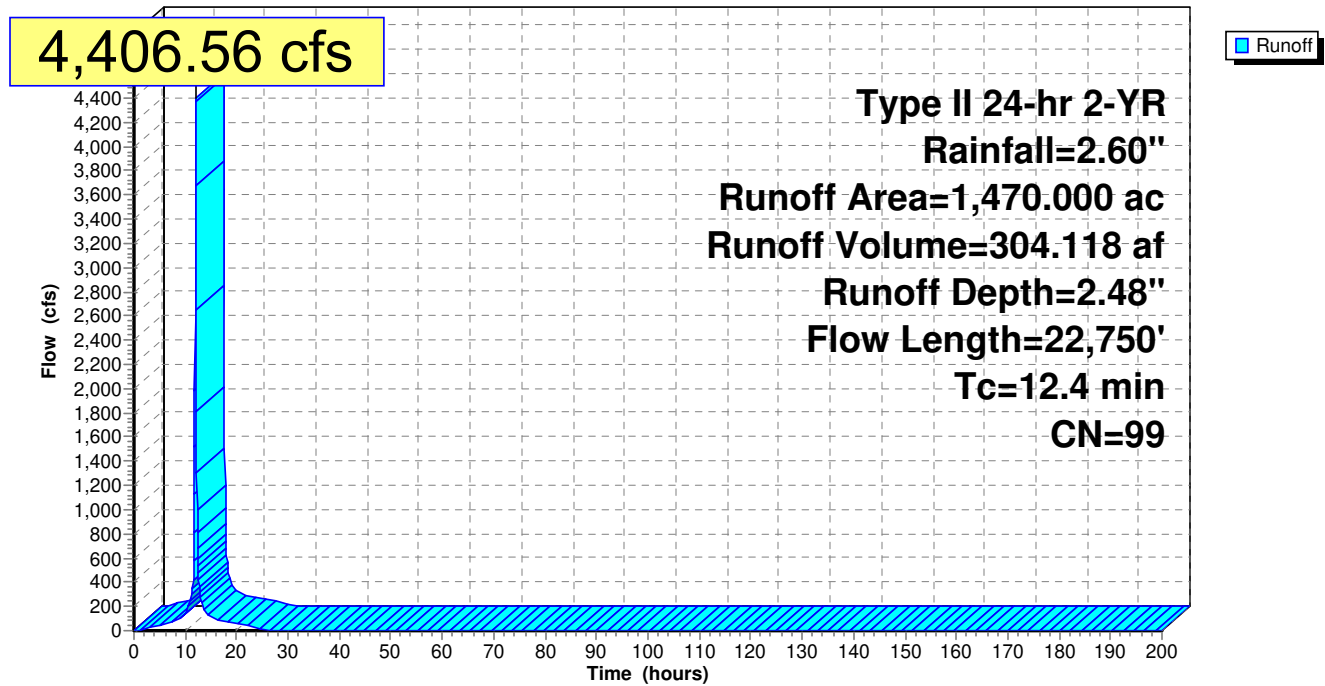
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
1,470.000	99	
1,470.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	22,750		30.56		Lake or Reservoir, Mean Depth= 29.00'

Subcatchment 1S: UPPER EAU CLAIRE

Hydrograph



Barnes - Future

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Type II 24-hr 2-YR Rainfall=2.60"

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Subcatchment 3S: MIDDLE EAU CLAIRE

Runoff = 3,142.29 cfs @ 12.04 hrs, Volume= 221.778 af, Depth= 2.48"

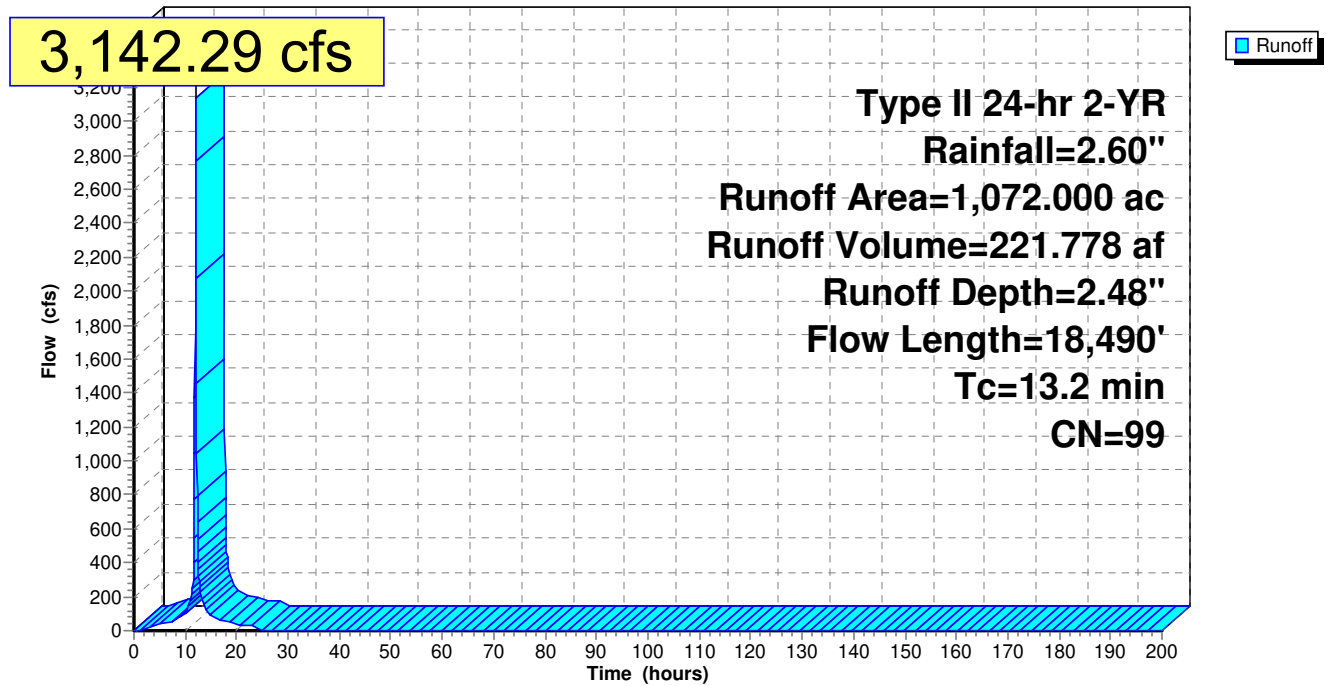
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
1,072.000	99	
1,072.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	18,490		23.40		Lake or Reservoir, Mean Depth= 17.00'

Subcatchment 3S: MIDDLE EAU CLAIRE

Hydrograph



Barnes - Future

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Type II 24-hr 2-YR Rainfall=2.60"

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Subcatchment 5S: LOWER EAU CLAIRE

Runoff = 3,066.39 cfs @ 11.99 hrs, Volume= 187.022 af, Depth= 2.48"

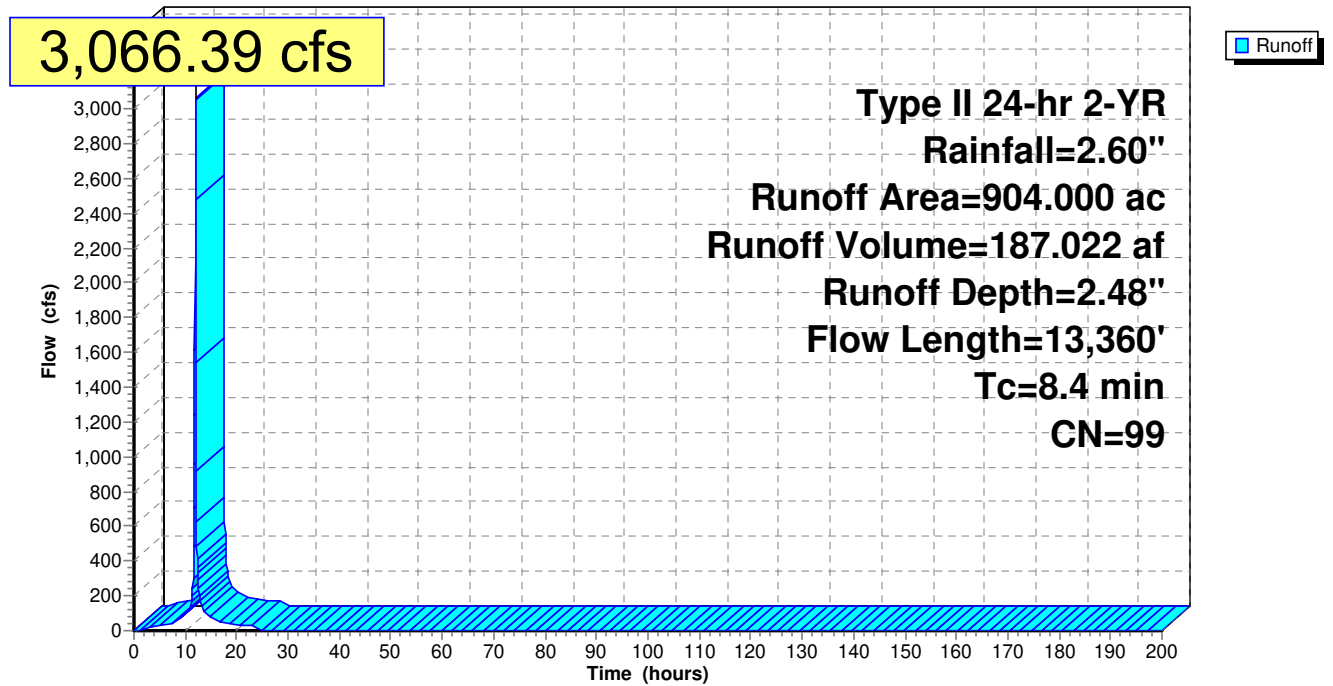
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
904.000	99	
904.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	13,360		26.62		Lake or Reservoir, Mean Depth= 22.00'

Subcatchment 5S: LOWER EAU CLAIRE

Hydrograph



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Type II 24-hr 2-YR Rainfall=2.60"

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Subcatchment A:

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

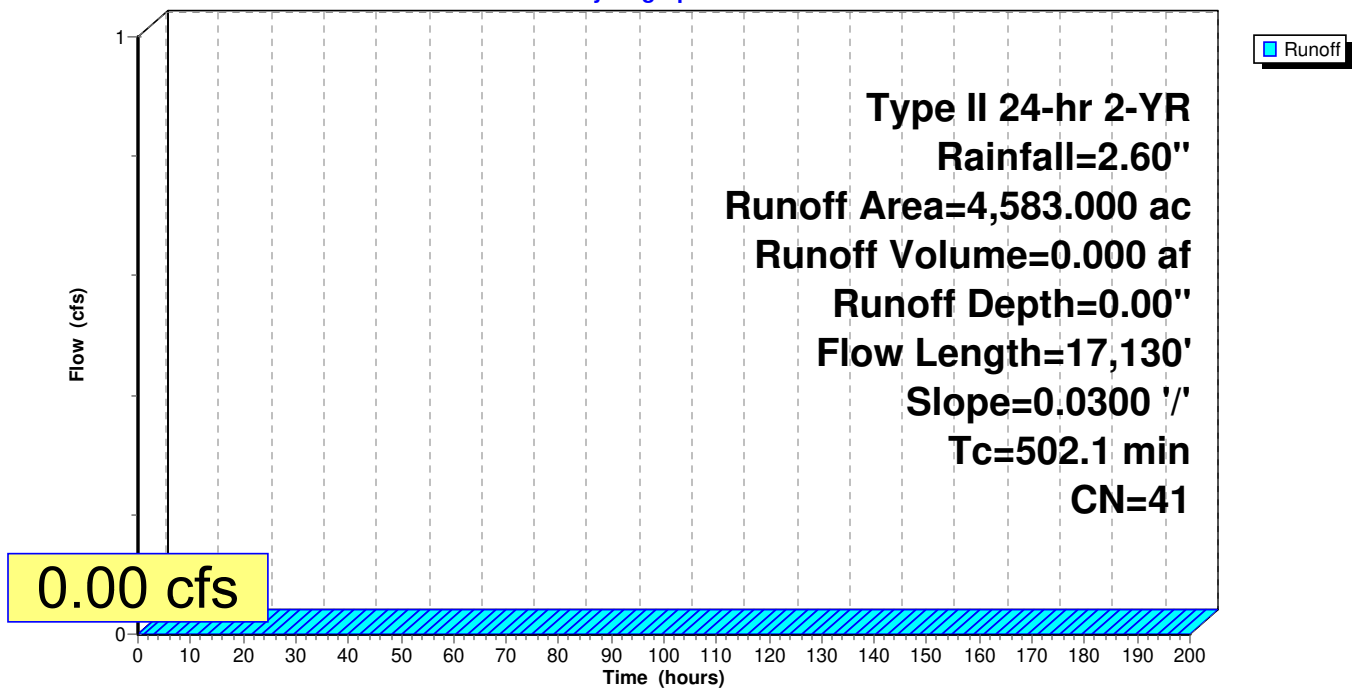
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
4,583.000	41	
4,583.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
502.1	17,130	0.0300	0.57		Lag/CN Method,

Subcatchment A:

Hydrograph



Barnes - Future

Subcatchment B:

Runoff = 1.05 cfs @ 25.24 hrs, Volume= 0.363 af, Depth= 0.00"

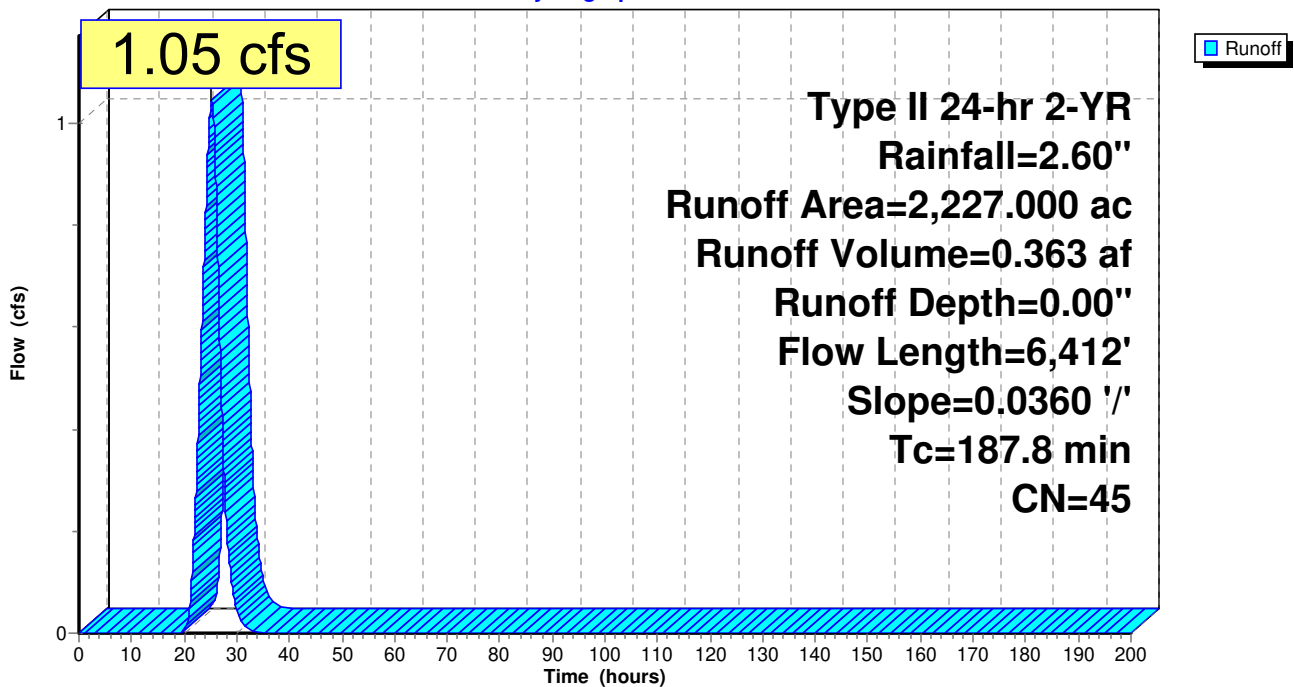
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
2,227.000	45	
2,227.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
187.8	6,412	0.0360	0.57		Lag/CN Method,

Subcatchment B:

Hydrograph



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Type II 24-hr 2-YR Rainfall=2.60"

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Subcatchment C:

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

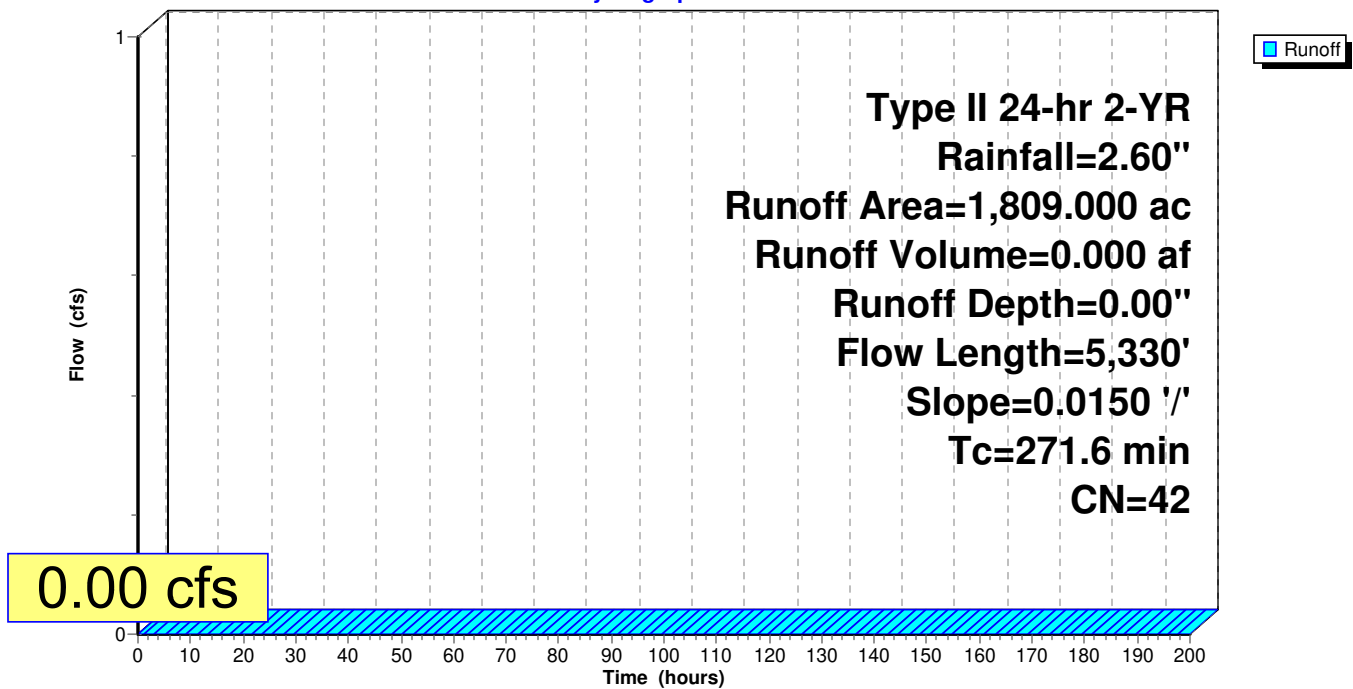
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.60"

Area (ac)	CN	Description
1,809.000	42	
1,809.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
271.6	5,330	0.0150	0.33		Lag/CN Method,

Subcatchment C:

Hydrograph



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Type II 24-hr 2-YR Rainfall=2.60"

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Pond 1P:

Inflow Area = 6,053.000 ac, Inflow Depth = 0.60" for 2-YR event
 Inflow = 4,406.56 cfs @ 12.03 hrs, Volume= 304.118 af
 Outflow = 15.93 cfs @ 24.21 hrs, Volume= 156.604 af, Atten= 100%, Lag= 730.3 min
 Primary = 15.93 cfs @ 24.21 hrs, Volume= 156.604 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,135.20' @ 24.21 hrs Surf.Area= 1,432.326 ac Storage= 289.448 af

Plug-Flow detention time= 4,787.3 min calculated for 156.604 af (51% of inflow)
 Center-of-Mass det. time= 4,660.1 min (5,409.1 - 749.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,135.00'	4,554.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,135.00	1,423.000	0.000	0.000
1,136.00	1,469.000	1,446.000	1,446.000
1,138.00	1,639.000	3,108.000	4,554.000

Device	Routing	Invert	Outlet Devices
#1	Primary	1,135.00'	65.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.90 cfs @ 24.21 hrs HW=1,135.20' (Free Discharge)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 15.90 cfs @ 1.21 fps)

Barnes - Future

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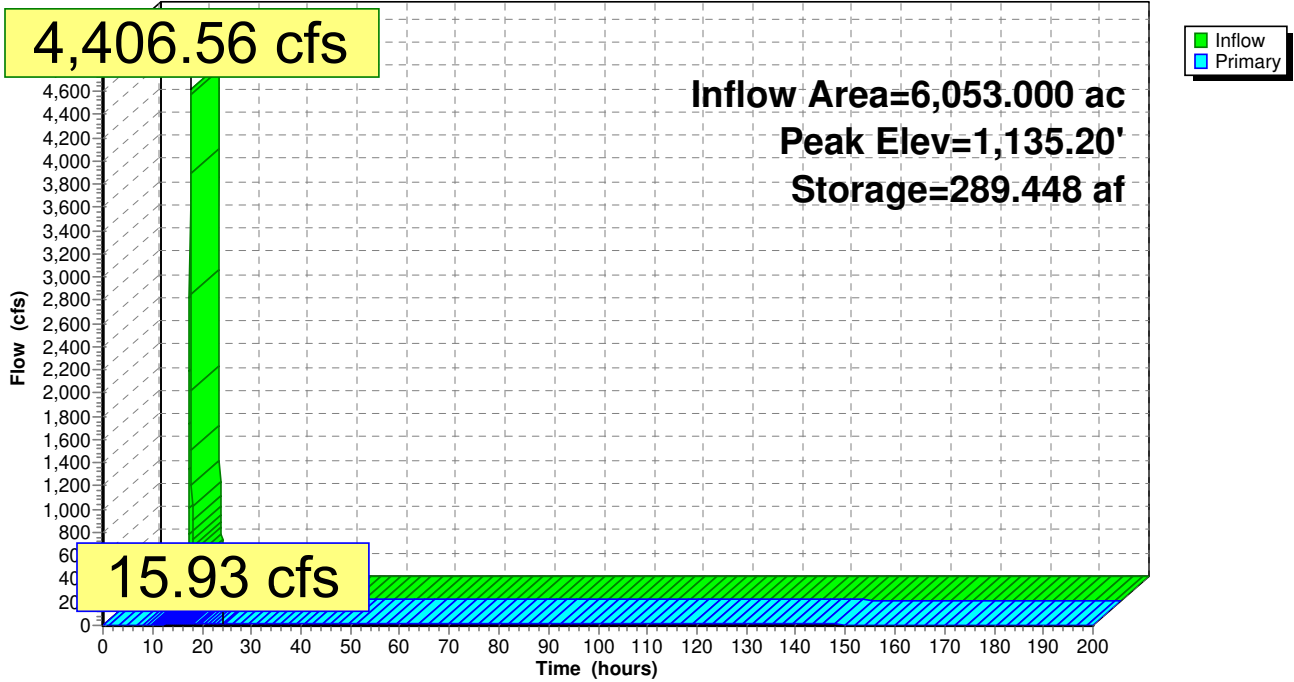
Type II 24-hr 2-YR Rainfall=2.60"

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Pond 1P:

Hydrograph



Barnes - Future

Type II 24-hr 2-YR Rainfall=2.60"

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Pond 2P:

Inflow Area = 9,352.000 ac, Inflow Depth > 0.49" for 2-YR event
 Inflow = 3,148.15 cfs @ 12.04 hrs, Volume= 378.745 af
 Outflow = 34.12 cfs @ 24.18 hrs, Volume= 291.841 af, Atten= 99%, Lag= 728.0 min
 Primary = 34.12 cfs @ 24.18 hrs, Volume= 291.841 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,126.24' @ 24.18 hrs Surf.Area= 866.301 ac Storage= 204.475 af

Plug-Flow detention time= 3,968.8 min calculated for 291.841 af (77% of inflow)
 Center-of-Mass det. time= 2,455.2 min (5,132.3 - 2,677.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,126.00'	1,786.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)
#2	1,127.00'	597.500 af	Custom Stage Data (Prismatic) Listed below (Recalc)
		2,383.500 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,126.00	858.000	0.000	0.000
1,128.00	928.000	1,786.000	1,786.000

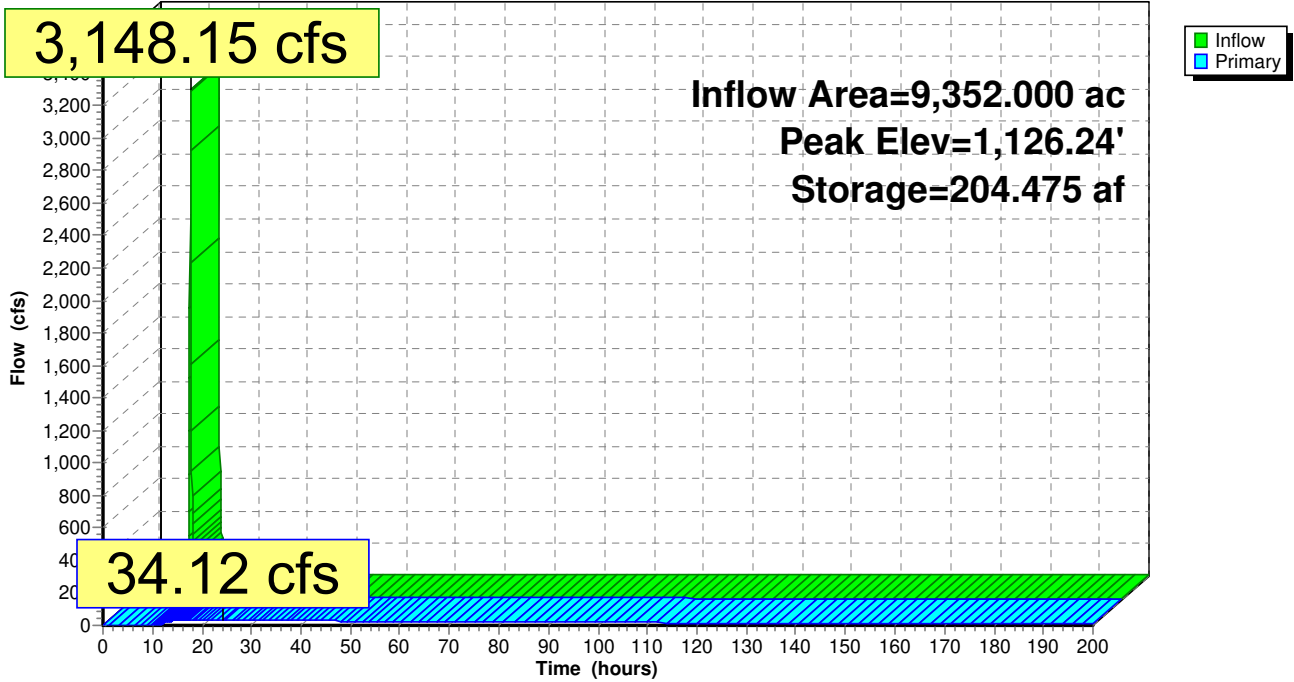
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,127.00	192.000	0.000	0.000
1,128.00	197.000	194.500	194.500
1,130.00	206.000	403.000	597.500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,126.00'	110.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=34.10 cfs @ 24.18 hrs HW=1,126.24' (Free Discharge)
 ←1=Broad-Crested Rectangular Weir (Weir Controls 34.10 cfs @ 1.31 fps)

Pond 2P:

Hydrograph



Barnes - Future

Type II 24-hr 2-YR Rainfall=2.60"

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Pond 3P:

Inflow Area = 12,065.000 ac, Inflow Depth > 0.48" for 2-YR event
 Inflow = 3,076.78 cfs @ 11.99 hrs, Volume= 478.863 af
 Outflow = 21.30 cfs @ 74.87 hrs, Volume= 292.979 af, Atten= 99%, Lag= 3,772.5 min
 Primary = 21.30 cfs @ 74.87 hrs, Volume= 292.979 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,122.26' @ 74.87 hrs Surf.Area= 900.302 ac Storage= 232.486 af

Plug-Flow detention time= 5,056.2 min calculated for 292.979 af (61% of inflow)
 Center-of-Mass det. time= 2,818.6 min (6,237.5 - 3,418.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,122.00'	1,848.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,122.00	892.000	0.000	0.000
1,124.00	956.000	1,848.000	1,848.000

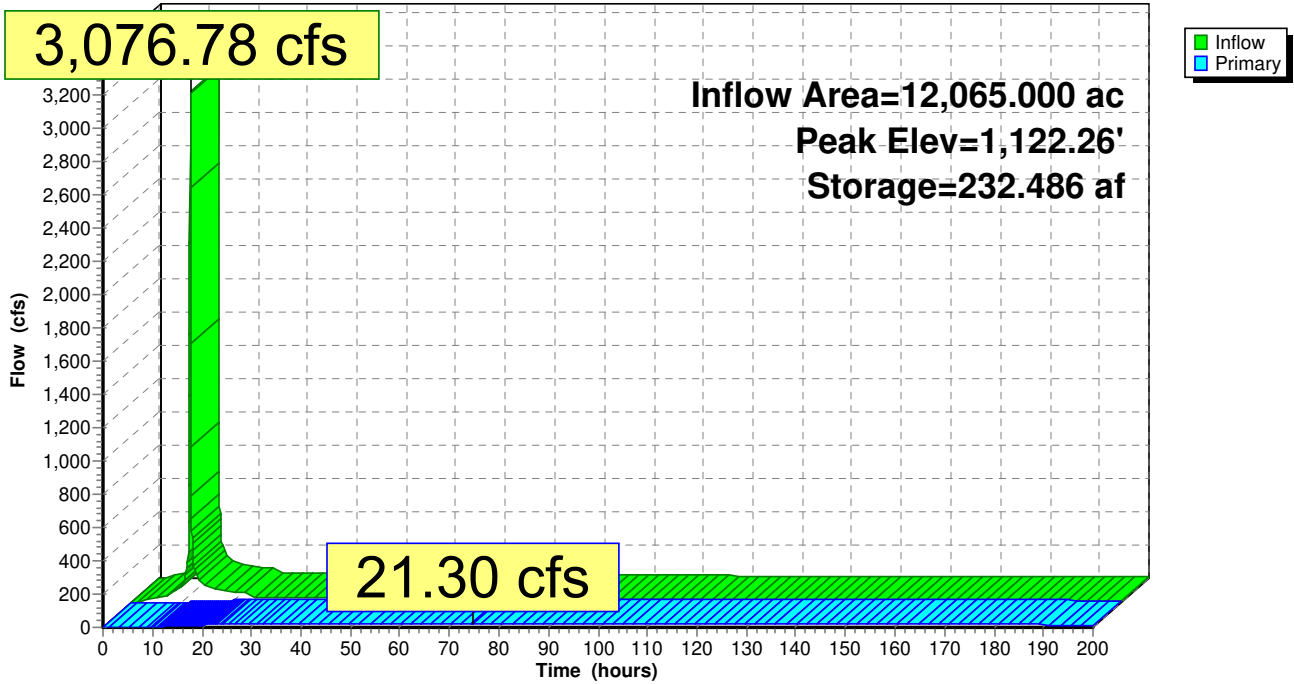
Device	Routing	Invert	Outlet Devices
#1	Primary	1,122.00'	60.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.29 cfs @ 74.87 hrs HW=1,122.26' (Free Discharge)

↑1=**Broad-Crested Rectangular Weir** (Weir Controls 21.29 cfs @ 1.37 fps)

Pond 3P:

Hydrograph



Barnes - Future

Type II 24-hr 10-YR Rainfall=3.90"

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Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: UPPER EAU CLAIRE

Runoff Area=1,470.000 ac Runoff Depth=3.78"

Flow Length=22,750' Tc=12.4 min CN=99 Runoff=6,629.15 cfs 463.215 af

Subcatchment 3S: MIDDLE EAU CLAIRE

Runoff Area=1,072.000 ac Runoff Depth=3.78"

Flow Length=18,490' Tc=13.2 min CN=99 Runoff=4,727.38 cfs 337.801 af

Subcatchment 5S: LOWER EAU CLAIRE

Runoff Area=904.000 ac Runoff Depth=3.78"

Flow Length=13,360' Tc=8.4 min CN=99 Runoff=4,612.22 cfs 284.862 af

Subcatchment A:

Runoff Area=4,583.000 ac Runoff Depth=0.07"

Flow Length=17,130' Slope=0.0300 '/' Tc=502.1 min CN=41 Runoff=25.13 cfs 25.880 af

Subcatchment B:

Runoff Area=2,227.000 ac Runoff Depth=0.15"

Flow Length=6,412' Slope=0.0360 '/' Tc=187.8 min CN=45 Runoff=35.55 cfs 28.746 af

Subcatchment C:

Runoff Area=1,809.000 ac Runoff Depth=0.09"

Flow Length=5,330' Slope=0.0150 '/' Tc=271.6 min CN=42 Runoff=14.11 cfs 13.063 af

Pond 1P:Peak Elev=1,135.31' Storage=445.686 af Inflow=6,629.15 cfs 489.096 af
Outflow=30.46 cfs 285.137 af**Pond 2P:**Peak Elev=1,126.38' Storage=326.985 af Inflow=4,738.55 cfs 651.684 af
Outflow=69.09 cfs 532.431 af**Pond 3P:**Peak Elev=1,122.42' Storage=375.901 af Inflow=4,632.06 cfs 830.356 af
Outflow=43.83 cfs 566.068 af**Total Runoff Area = 12,065.000 ac Runoff Volume = 1,153.567 af Average Runoff Depth = 1.15"****71.44% Pervious Area = 8,619.000 ac 28.56% Impervious Area = 3,446.000 ac**

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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment 1S: UPPER EAU CLAIRE

Runoff = 6,629.15 cfs @ 12.03 hrs, Volume= 463.215 af, Depth= 3.78"

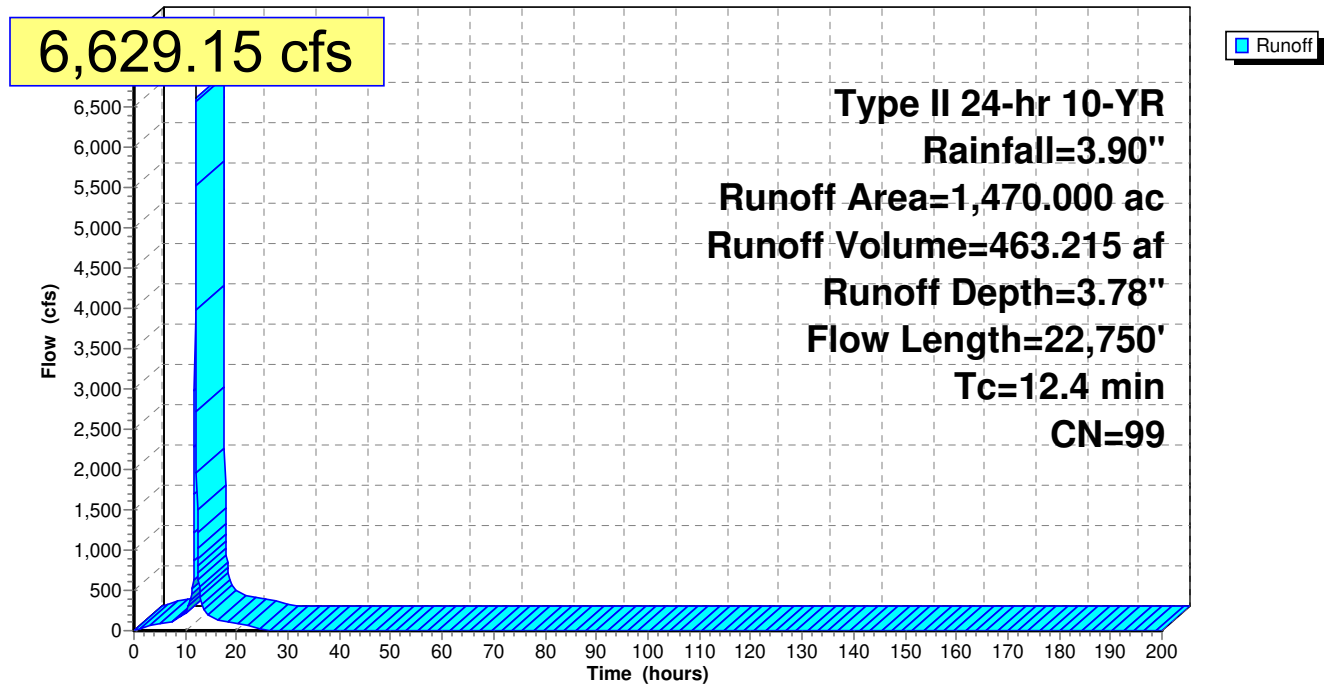
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
1,470.000	99	
1,470.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	22,750		30.56		Lake or Reservoir, Mean Depth= 29.00'

Subcatchment 1S: UPPER EAU CLAIRE

Hydrograph



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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment 3S: MIDDLE EAU CLAIRE

Runoff = 4,727.38 cfs @ 12.04 hrs, Volume= 337.801 af, Depth= 3.78"

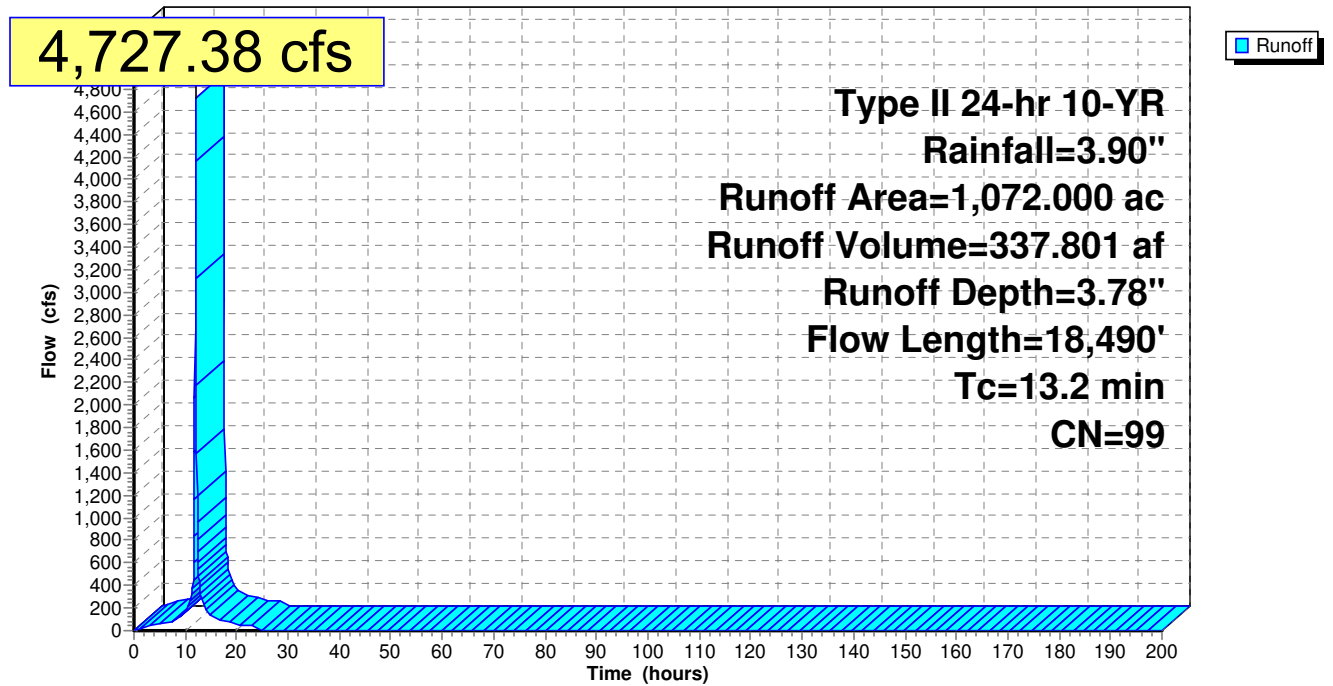
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
1,072.000	99	
1,072.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	18,490		23.40		Lake or Reservoir, Mean Depth= 17.00'

Subcatchment 3S: MIDDLE EAU CLAIRE

Hydrograph



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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment 5S: LOWER EAU CLAIRE

Runoff = 4,612.22 cfs @ 11.99 hrs, Volume= 284.862 af, Depth= 3.78"

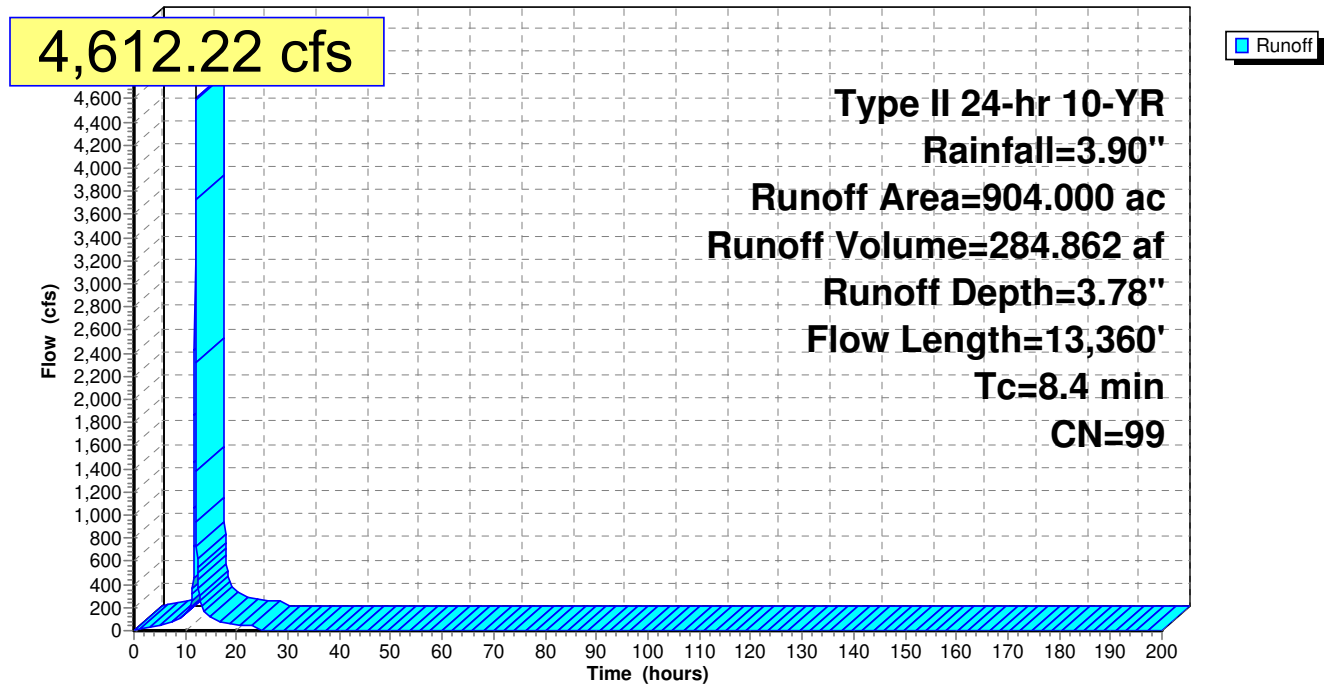
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
904.000	99	
904.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	13,360		26.62		Lake or Reservoir, Mean Depth= 22.00'

Subcatchment 5S: LOWER EAU CLAIRE

Hydrograph



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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment A:

Runoff = 25.13 cfs @ 25.14 hrs, Volume= 25.880 af, Depth= 0.07"

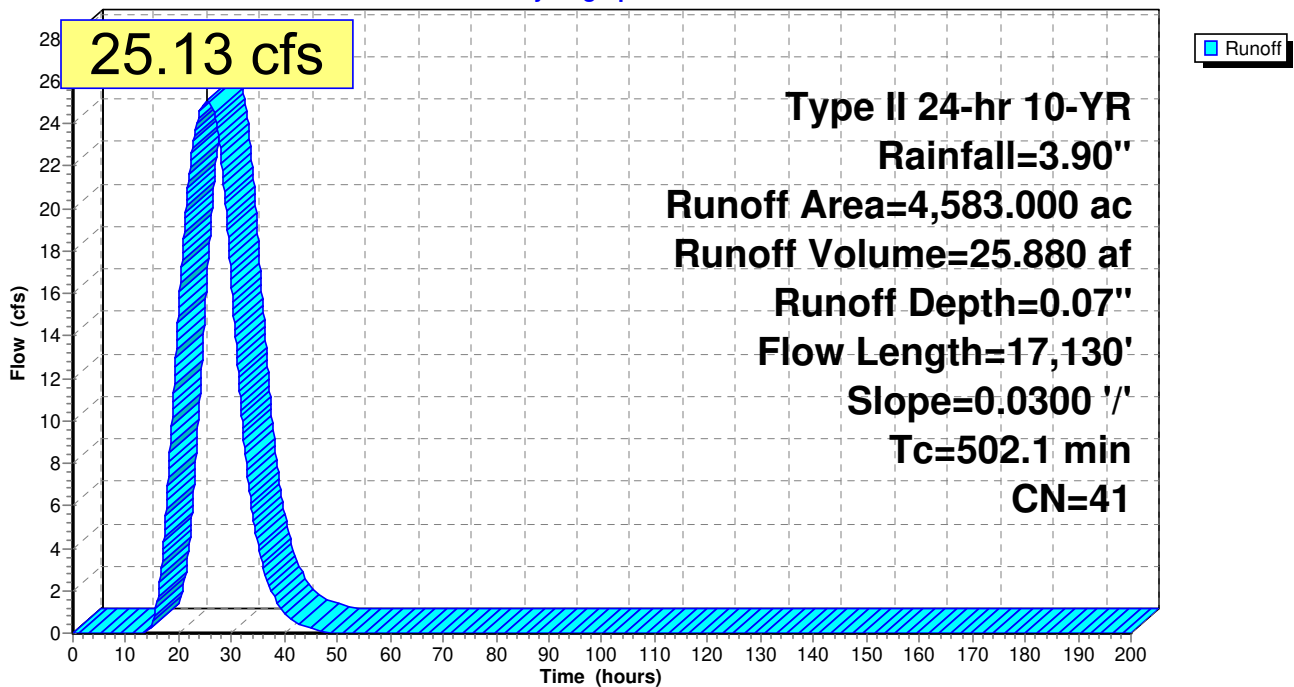
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
4,583.000	41	
4,583.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
502.1	17,130	0.0300	0.57		Lag/CN Method,

Subcatchment A:

Hydrograph



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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment B:

Runoff = 35.55 cfs @ 16.10 hrs, Volume= 28.746 af, Depth= 0.15"

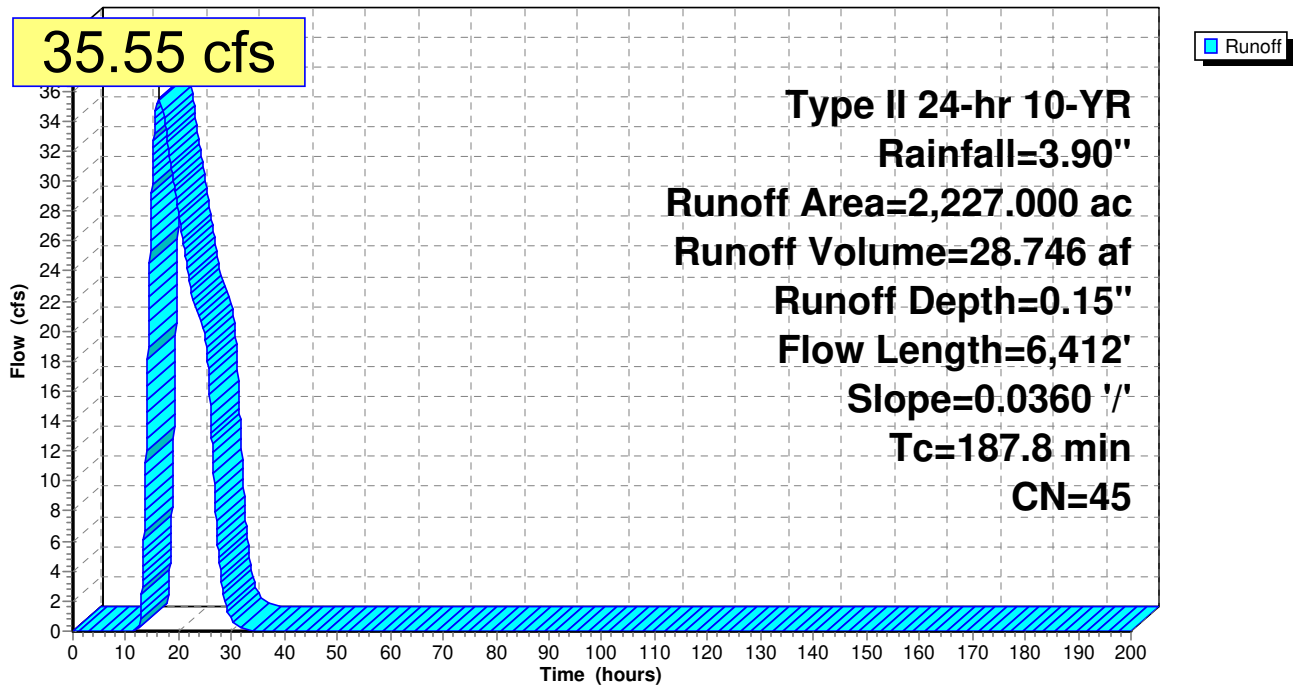
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
2,227.000	45	
2,227.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
187.8	6,412	0.0360	0.57		Lag/CN Method,

Subcatchment B:

Hydrograph



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Type II 24-hr 10-YR Rainfall=3.90"

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Subcatchment C:

Runoff = 14.11 cfs @ 20.21 hrs, Volume= 13.063 af, Depth= 0.09"

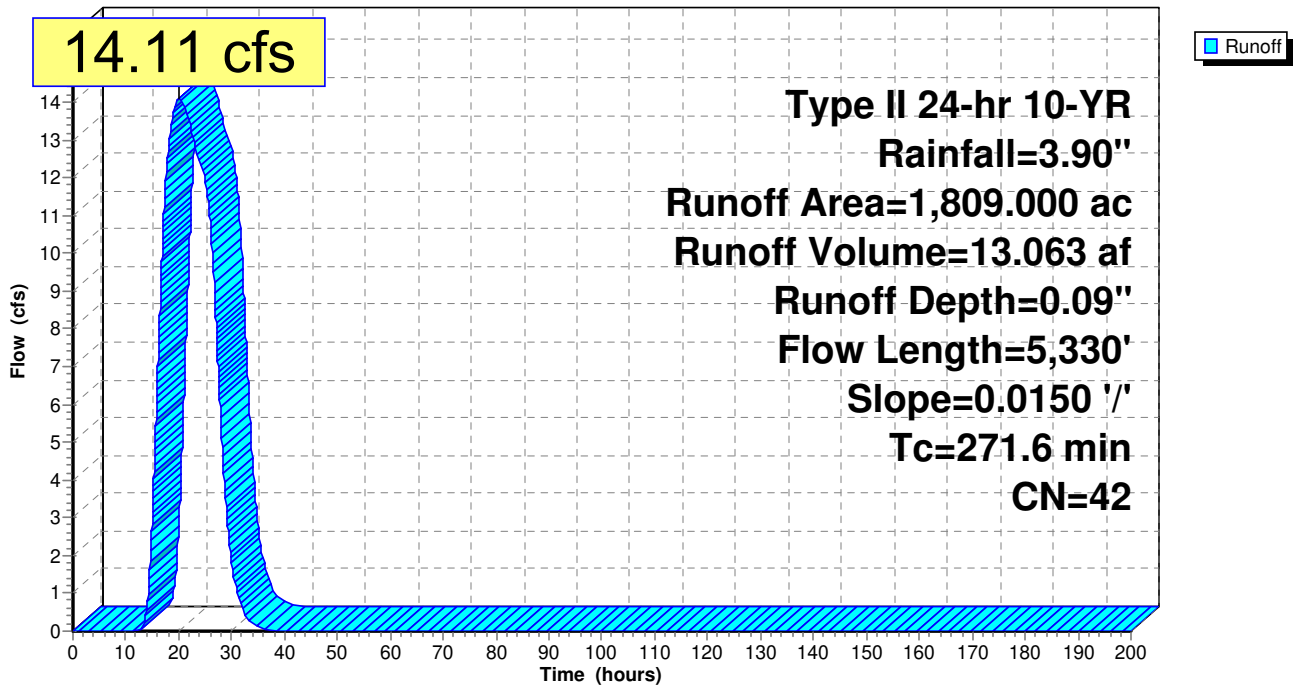
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
1,809.000	42	
1,809.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
271.6	5,330	0.0150	0.33		Lag/CN Method,

Subcatchment C:

Hydrograph



Barnes - Future

Type II 24-hr 10-YR Rainfall=3.90"

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Pond 1P:

Inflow Area = 6,053.000 ac, Inflow Depth = 0.97" for 10-YR event
 Inflow = 6,629.15 cfs @ 12.03 hrs, Volume= 489.096 af
 Outflow = 30.46 cfs @ 24.33 hrs, Volume= 285.137 af, Atten= 100%, Lag= 737.5 min
 Primary = 30.46 cfs @ 24.33 hrs, Volume= 285.137 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,135.31' @ 24.33 hrs Surf.Area= 1,437.335 ac Storage= 445.686 af

Plug-Flow detention time= 4,602.0 min calculated for 285.137 af (58% of inflow)
 Center-of-Mass det. time= 4,446.9 min (5,233.1 - 786.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,135.00'	4,554.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,135.00	1,423.000	0.000	0.000
1,136.00	1,469.000	1,446.000	1,446.000
1,138.00	1,639.000	3,108.000	4,554.000

Device	Routing	Invert	Outlet Devices
#1	Primary	1,135.00'	65.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=30.43 cfs @ 24.33 hrs HW=1,135.31' (Free Discharge)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 30.43 cfs @ 1.50 fps)

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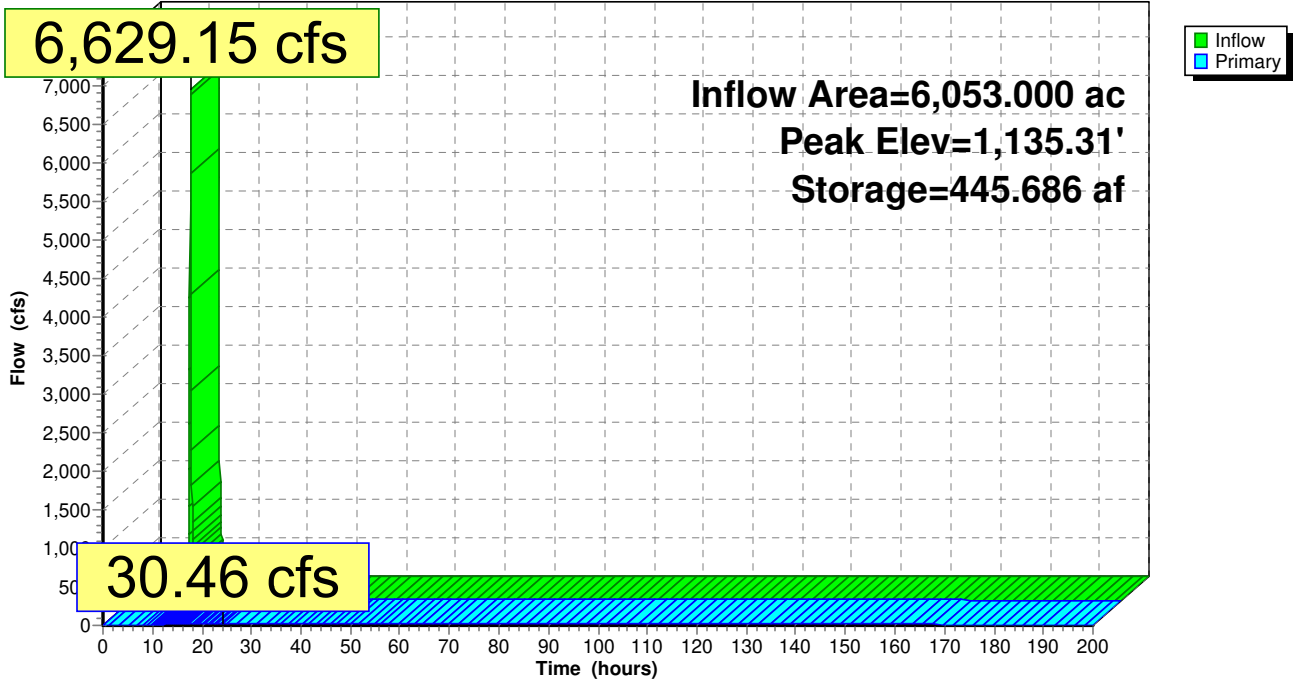
Type II 24-hr 10-YR Rainfall=3.90"

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Pond 1P:

Hydrograph



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Type II 24-hr 10-YR Rainfall=3.90"

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Pond 2P:

Inflow Area = 9,352.000 ac, Inflow Depth > 0.84" for 10-YR event
 Inflow = 4,738.55 cfs @ 12.04 hrs, Volume= 651.684 af
 Outflow = 69.09 cfs @ 24.22 hrs, Volume= 532.431 af, Atten= 99%, Lag= 730.4 min
 Primary = 69.09 cfs @ 24.22 hrs, Volume= 532.431 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,126.38' @ 24.22 hrs Surf.Area= 871.236 ac Storage= 326.985 af

Plug-Flow detention time= 3,458.9 min calculated for 532.431 af (82% of inflow)
 Center-of-Mass det. time= 2,187.6 min (4,915.1 - 2,727.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,126.00'	1,786.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)
#2	1,127.00'	597.500 af	Custom Stage Data (Prismatic) Listed below (Recalc)
		2,383.500 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,126.00	858.000	0.000	0.000
1,128.00	928.000	1,786.000	1,786.000

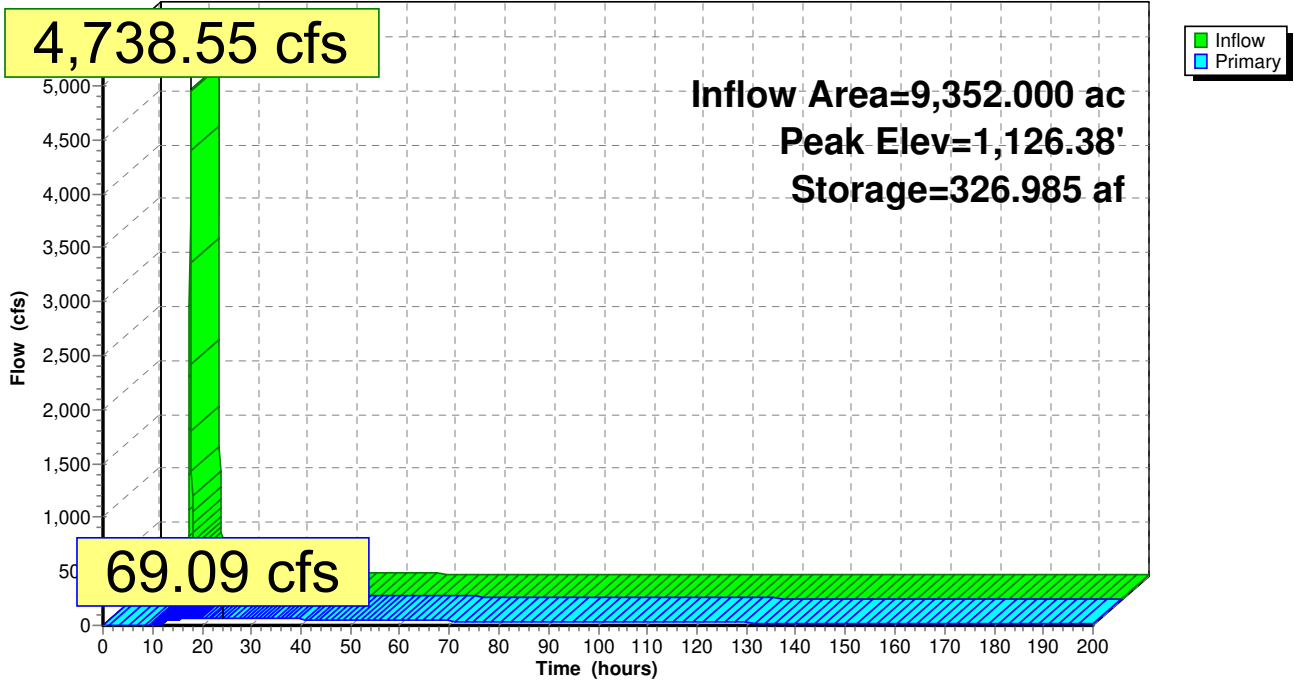
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,127.00	192.000	0.000	0.000
1,128.00	197.000	194.500	194.500
1,130.00	206.000	403.000	597.500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,126.00'	110.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=69.02 cfs @ 24.22 hrs HW=1,126.38' (Free Discharge)
 ←1=Broad-Crested Rectangular Weir (Weir Controls 69.02 cfs @ 1.66 fps)

Pond 2P:

Hydrograph



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Type II 24-hr 10-YR Rainfall=3.90"

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Pond 3P:

Inflow Area = 12,065.000 ac, Inflow Depth > 0.83" for 10-YR event

Inflow = 4,632.06 cfs @ 11.99 hrs, Volume= 830.356 af

Outflow = 43.83 cfs @ 62.96 hrs, Volume= 566.068 af, Atten= 99%, Lag= 3,058.1 min

Primary = 43.83 cfs @ 62.96 hrs, Volume= 566.068 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Peak Elev= 1,122.42' @ 62.96 hrs Surf.Area= 905.385 ac Storage= 375.901 af

Plug-Flow detention time= 4,528.1 min calculated for 566.068 af (68% of inflow)

Center-of-Mass det. time= 2,618.1 min (6,044.2 - 3,426.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,122.00'	1,848.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)

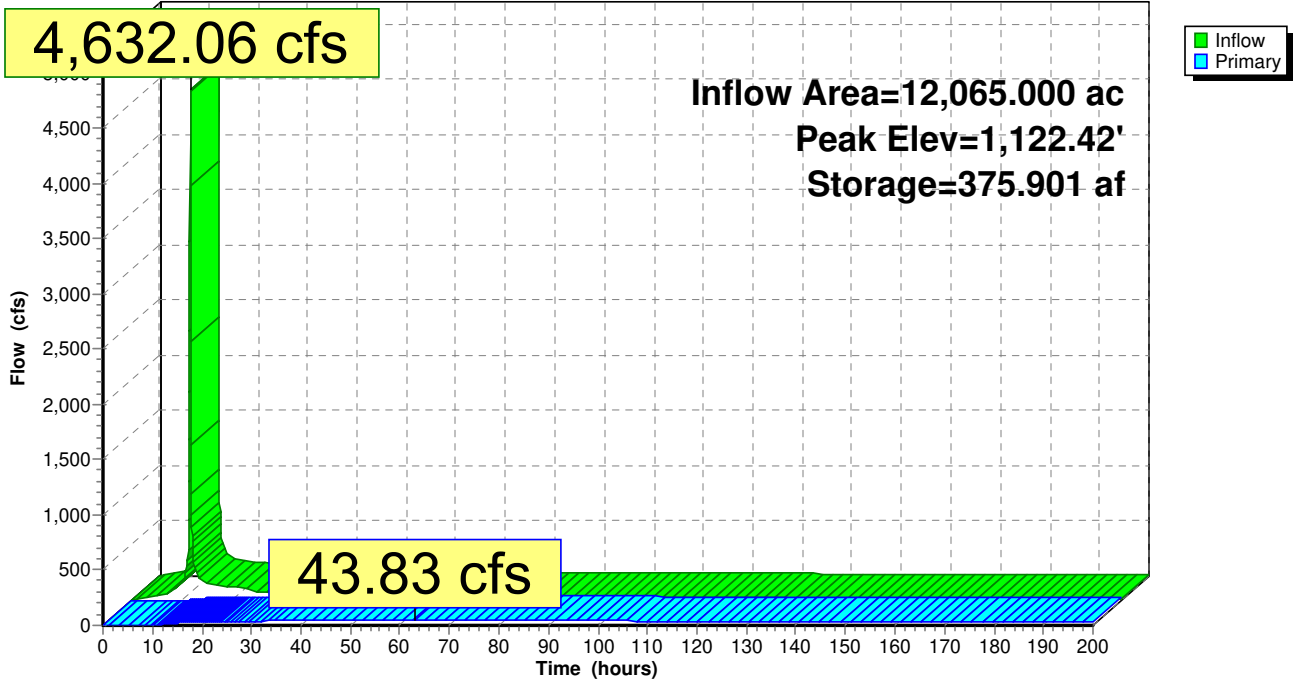
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,122.00	892.000	0.000	0.000
1,124.00	956.000	1,848.000	1,848.000

Device	Routing	Invert	Outlet Devices
#1	Primary	1,122.00'	60.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=43.82 cfs @ 62.96 hrs HW=1,122.42' (Free Discharge)↑1=**Broad-Crested Rectangular Weir** (Weir Controls 43.82 cfs @ 1.75 fps)

Pond 3P:

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: UPPER EAU CLAIRE

Runoff Area=1,470.000 ac Runoff Depth=5.28"

Flow Length=22,750' Tc=12.4 min CN=99 Runoff=9,189.58 cfs 646.880 af

Subcatchment 3S: MIDDLE EAU CLAIRE

Runoff Area=1,072.000 ac Runoff Depth=5.28"

Flow Length=18,490' Tc=13.2 min CN=99 Runoff=6,553.38 cfs 471.738 af

Subcatchment 5S: LOWER EAU CLAIRE

Runoff Area=904.000 ac Runoff Depth=5.28"

Flow Length=13,360' Tc=8.4 min CN=99 Runoff=6,393.17 cfs 397.809 af

Subcatchment A:

Runoff Area=4,583.000 ac Runoff Depth=0.38"

Flow Length=17,130' Slope=0.0300 '/' Tc=502.1 min CN=41 Runoff=135.99 cfs 143.629 af

Subcatchment B:

Runoff Area=2,227.000 ac Runoff Depth=0.58"

Flow Length=6,412' Slope=0.0360 '/' Tc=187.8 min CN=45 Runoff=188.20 cfs 106.809 af

Subcatchment C:

Runoff Area=1,809.000 ac Runoff Depth=0.42"

Flow Length=5,330' Slope=0.0150 '/' Tc=271.6 min CN=42 Runoff=83.05 cfs 63.787 af

Pond 1P:

Peak Elev=1,135.49' Storage=697.046 af Inflow=9,189.58 cfs 790.509 af

Outflow=59.48 cfs 513.913 af

Pond 2P:

Peak Elev=1,126.58' Storage=501.259 af Inflow=6,571.95 cfs 1,092.460 af

Outflow=130.37 cfs 932.059 af

Pond 3P:

Peak Elev=1,122.65' Storage=590.173 af Inflow=6,426.23 cfs 1,393.655 af

Outflow=85.16 cfs 1,031.400 af

Total Runoff Area = 12,065.000 ac Runoff Volume = 1,830.652 af Average Runoff Depth = 1.82"**71.44% Pervious Area = 8,619.000 ac 28.56% Impervious Area = 3,446.000 ac**

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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment 1S: UPPER EAU CLAIRE

Runoff = 9,189.58 cfs @ 12.03 hrs, Volume= 646.880 af, Depth= 5.28"

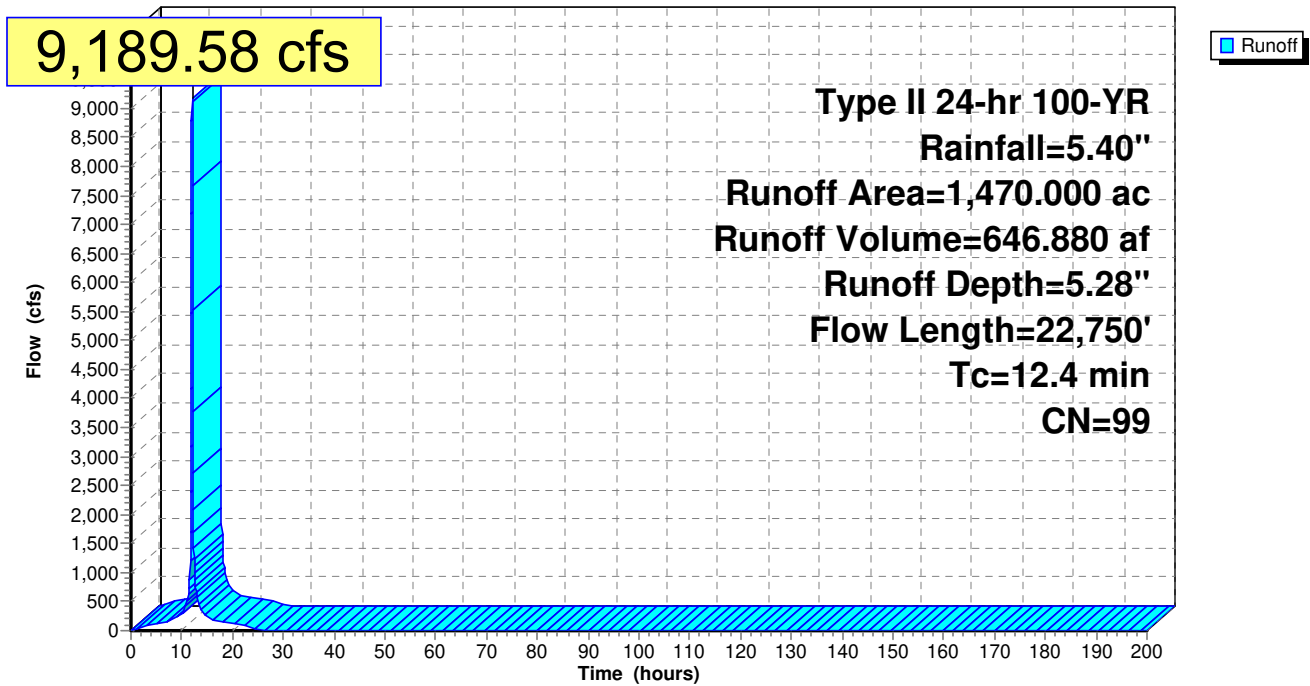
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
1,470.000	99	
1,470.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	22,750		30.56		Lake or Reservoir, Mean Depth= 29.00'

Subcatchment 1S: UPPER EAU CLAIRE

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment 3S: MIDDLE EAU CLAIRE

Runoff = 6,553.38 cfs @ 12.04 hrs, Volume= 471.738 af, Depth= 5.28"

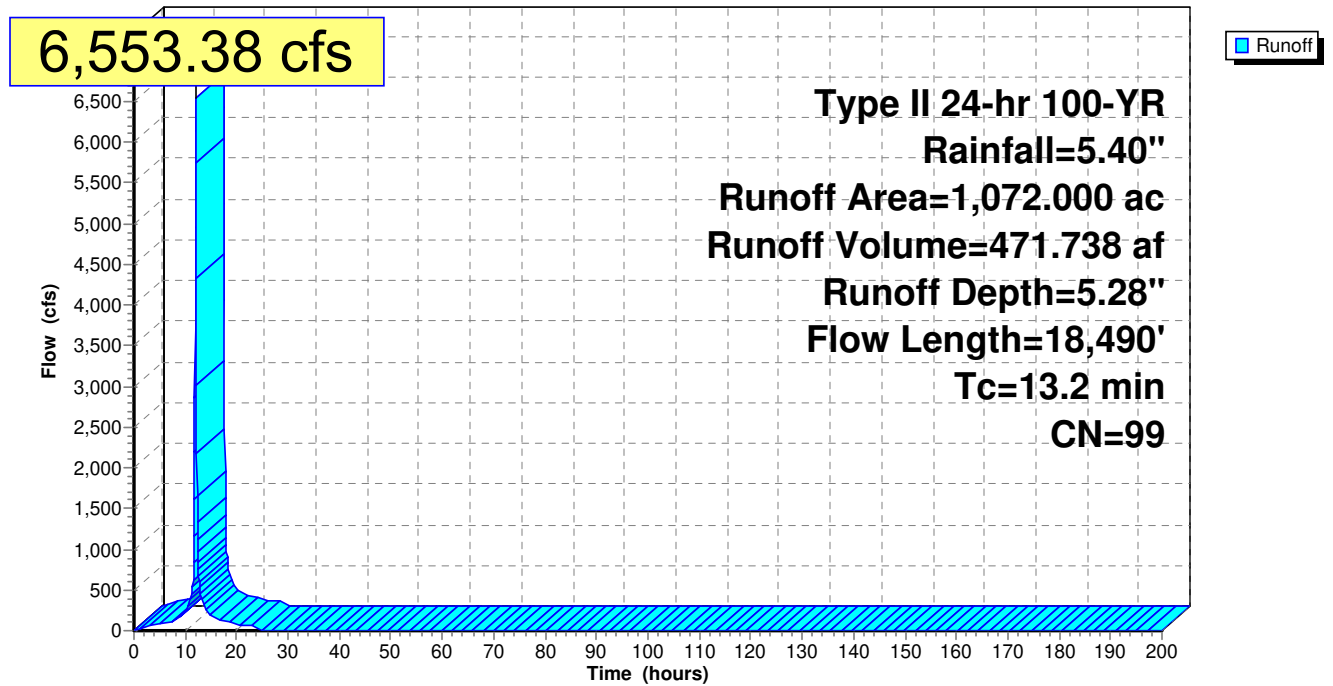
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
1,072.000	99	
1,072.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	18,490		23.40		Lake or Reservoir, Mean Depth= 17.00'

Subcatchment 3S: MIDDLE EAU CLAIRE

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment 5S: LOWER EAU CLAIRE

Runoff = 6,393.17 cfs @ 11.99 hrs, Volume= 397.809 af, Depth= 5.28"

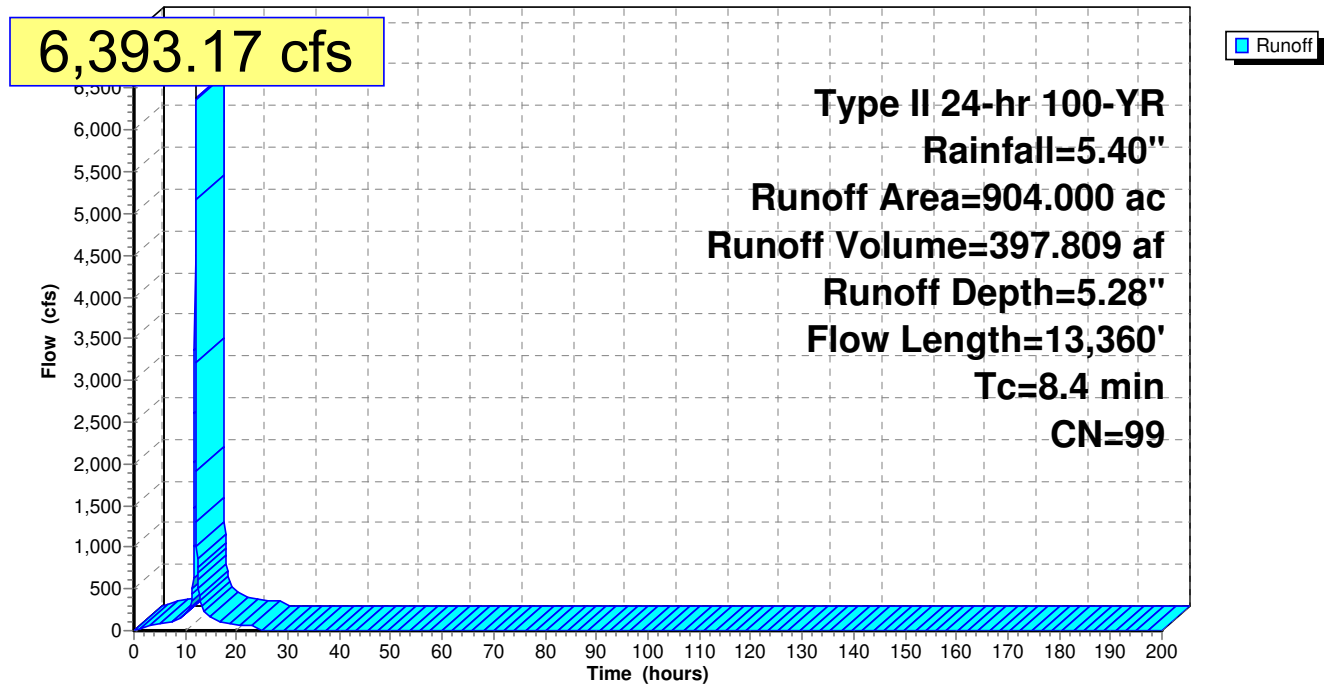
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
904.000	99	
904.000		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	13,360		26.62		Lake or Reservoir, Mean Depth= 22.00'

Subcatchment 5S: LOWER EAU CLAIRE

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment A:

Runoff = 135.99 cfs @ 20.66 hrs, Volume= 143.629 af, Depth= 0.38"

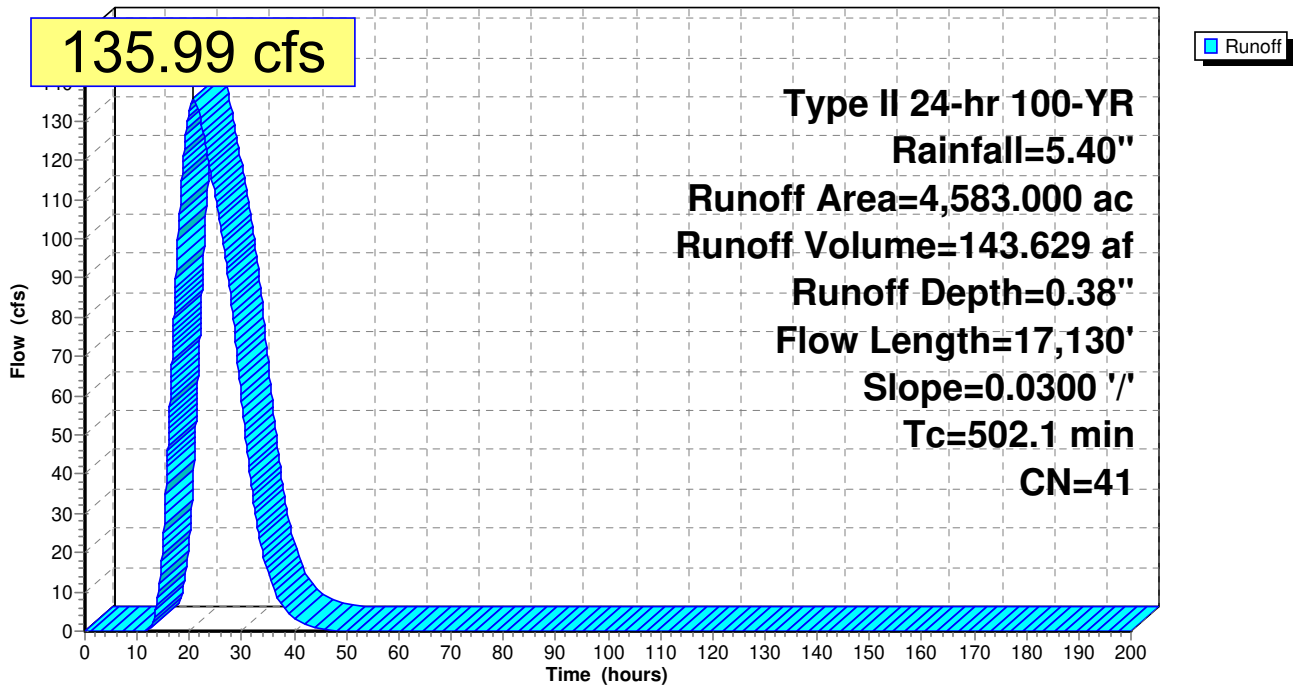
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
4,583.000	41	
4,583.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
502.1	17,130	0.0300	0.57		Lag/CN Method,

Subcatchment A:

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment B:

Runoff = 188.20 cfs @ 14.98 hrs, Volume= 106.809 af, Depth= 0.58"

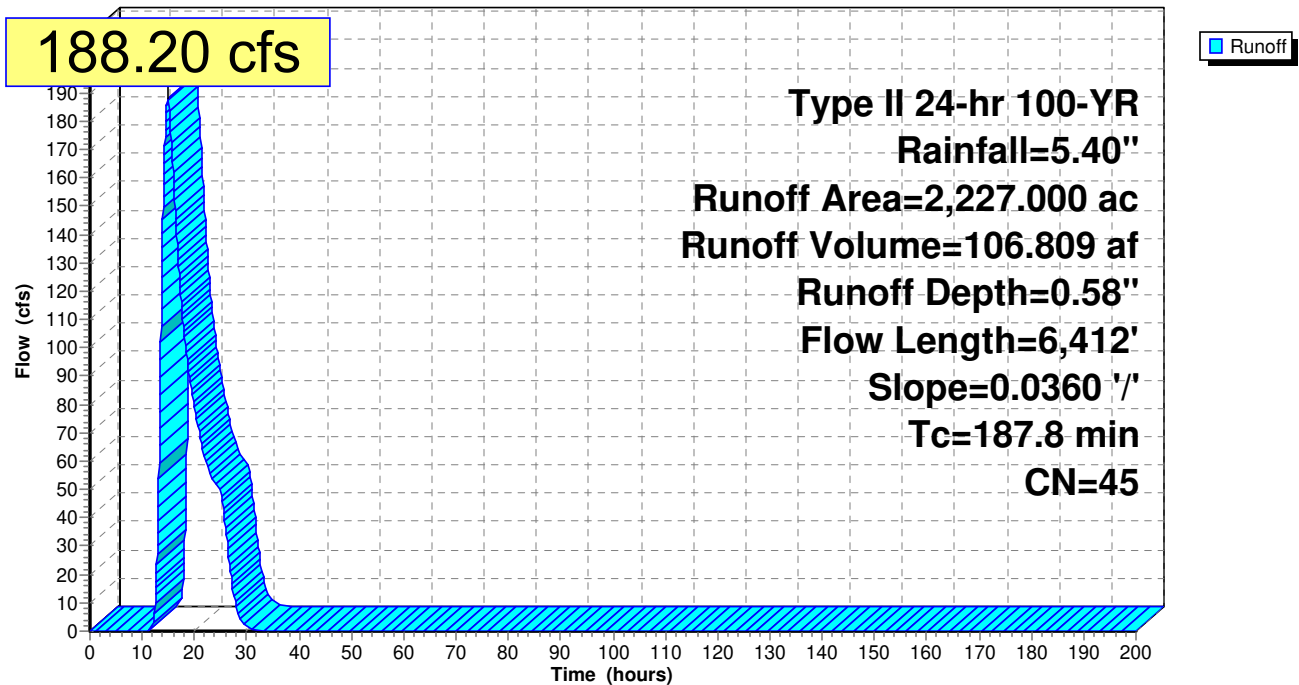
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
2,227.000	45	
2,227.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
187.8	6,412	0.0360	0.57		Lag/CN Method,

Subcatchment B:

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Subcatchment C:

Runoff = 83.05 cfs @ 16.60 hrs, Volume= 63.787 af, Depth= 0.42"

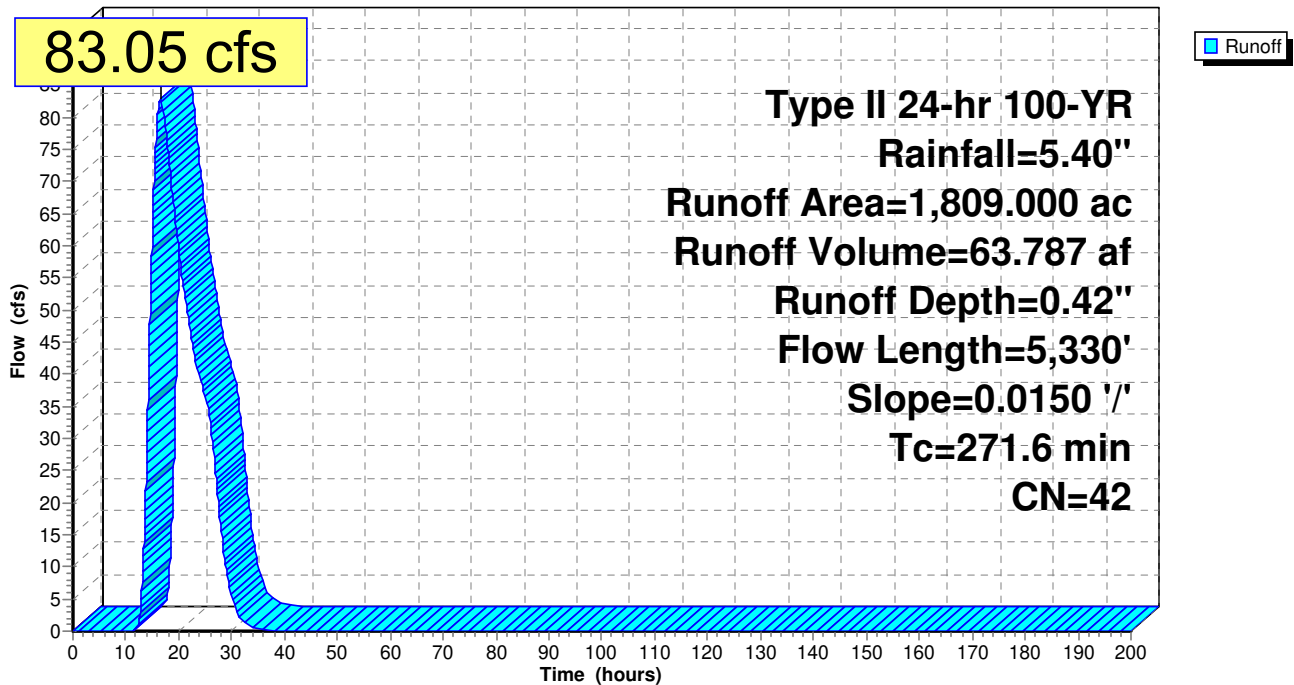
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.40"

Area (ac)	CN	Description
1,809.000	42	
1,809.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
271.6	5,330	0.0150	0.33		Lag/CN Method,

Subcatchment C:

Hydrograph



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Type II 24-hr 100-YR Rainfall=5.40"

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Pond 1P:

Inflow Area = 6,053.000 ac, Inflow Depth = 1.57" for 100-YR event

Inflow = 9,189.58 cfs @ 12.03 hrs, Volume= 790.509 af

Outflow = 59.48 cfs @ 29.92 hrs, Volume= 513.913 af, Atten= 99%, Lag= 1,073.4 min

Primary = 59.48 cfs @ 29.92 hrs, Volume= 513.913 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Peak Elev= 1,135.49' @ 29.92 hrs Surf.Area= 1,445.357 ac Storage= 697.046 af

Plug-Flow detention time= 4,406.9 min calculated for 513.913 af (65% of inflow)

Center-of-Mass det. time= 4,198.8 min (5,062.7 - 863.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,135.00'	4,554.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,135.00	1,423.000	0.000	0.000
1,136.00	1,469.000	1,446.000	1,446.000
1,138.00	1,639.000	3,108.000	4,554.000

Device	Routing	Invert	Outlet Devices
#1	Primary	1,135.00'	65.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=59.47 cfs @ 29.92 hrs HW=1,135.49' (Free Discharge)↑1=**Broad-Crested Rectangular Weir** (Weir Controls 59.47 cfs @ 1.88 fps)

Barnes - Future

Prepared by DAS, Cedar Corporation

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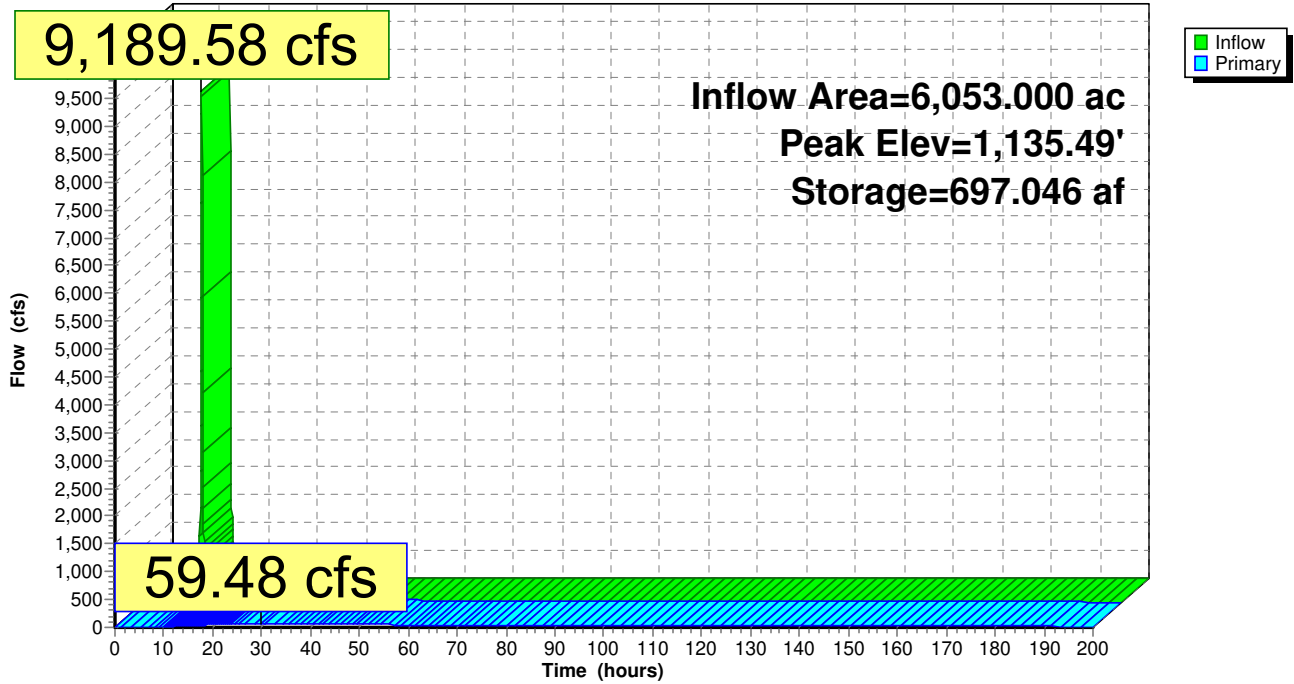
Type II 24-hr 100-YR Rainfall=5.40"

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7/20/2006

Pond 1P:

Hydrograph



Barnes - Future

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Type II 24-hr 100-YR Rainfall=5.40"

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Pond 2P:

Inflow Area = 9,352.000 ac, Inflow Depth > 1.40" for 100-YR event

Inflow = 6,571.95 cfs @ 12.04 hrs, Volume= 1,092.460 af

Outflow = 130.37 cfs @ 24.23 hrs, Volume= 932.059 af, Atten= 98%, Lag= 731.3 min

Primary = 130.37 cfs @ 24.23 hrs, Volume= 932.059 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Peak Elev= 1,126.58' @ 24.23 hrs Surf.Area= 878.210 ac Storage= 501.259 af

Plug-Flow detention time= 2,994.3 min calculated for 932.059 af (85% of inflow)

Center-of-Mass det. time= 1,941.2 min (4,750.0 - 2,808.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,126.00'	1,786.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)
#2	1,127.00'	597.500 af	Custom Stage Data (Prismatic) Listed below (Recalc)
		2,383.500 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,126.00	858.000	0.000	0.000
1,128.00	928.000	1,786.000	1,786.000

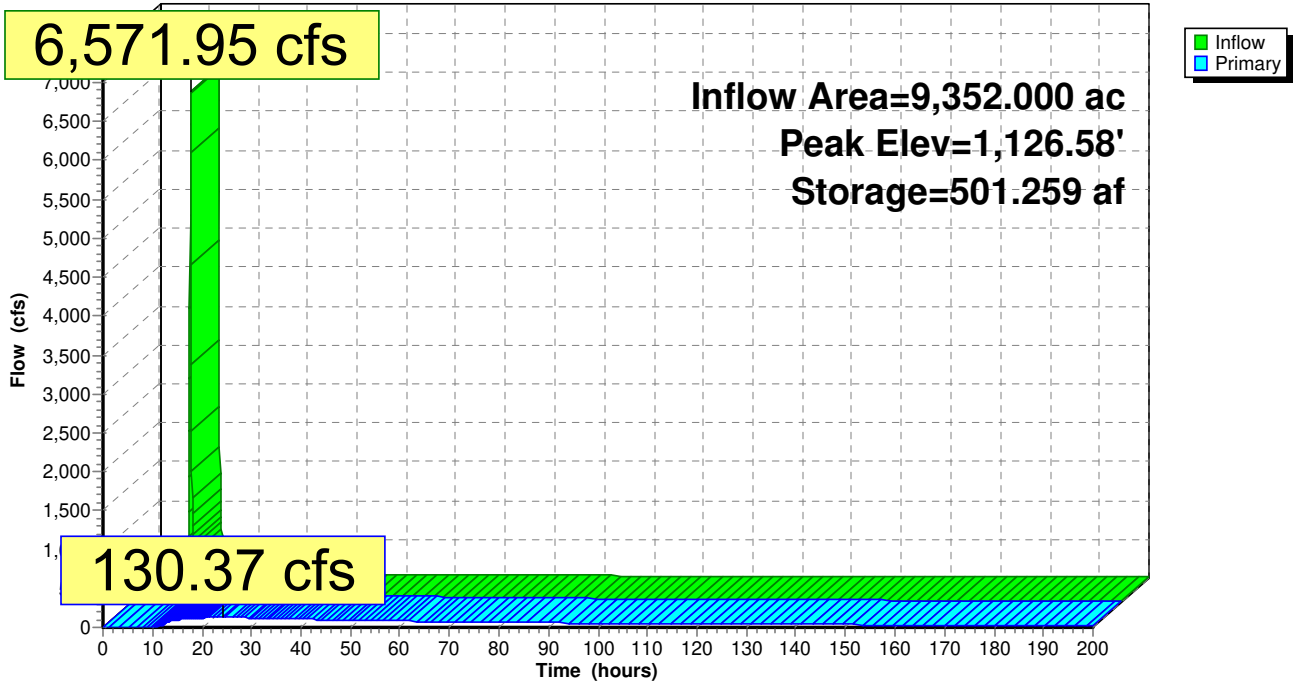
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,127.00	192.000	0.000	0.000
1,128.00	197.000	194.500	194.500
1,130.00	206.000	403.000	597.500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,126.00'	110.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=130.31 cfs @ 24.23 hrs HW=1,126.58' (Free Discharge)↑1=**Broad-Crested Rectangular Weir** (Weir Controls 130.31 cfs @ 2.05 fps)

Pond 2P:

Hydrograph



Barnes - Future

Type II 24-hr 100-YR Rainfall=5.40"

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7/20/2006

Pond 3P:

Inflow Area = 12,065.000 ac, Inflow Depth > 1.39" for 100-YR event

Inflow = 6,426.23 cfs @ 11.99 hrs, Volume= 1,393.655 af

Outflow = 85.16 cfs @ 56.13 hrs, Volume= 1,031.400 af, Atten= 99%, Lag= 2,648.5 min

Primary = 85.16 cfs @ 56.13 hrs, Volume= 1,031.400 af

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Peak Elev= 1,122.65' @ 56.13 hrs Surf.Area= 912.927 ac Storage= 590.173 af

Plug-Flow detention time= 4,033.1 min calculated for 1,031.142 af (74% of inflow)

Center-of-Mass det. time= 2,422.3 min (5,864.1 - 3,441.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,122.00'	1,848.000 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,122.00	892.000	0.000	0.000
1,124.00	956.000	1,848.000	1,848.000

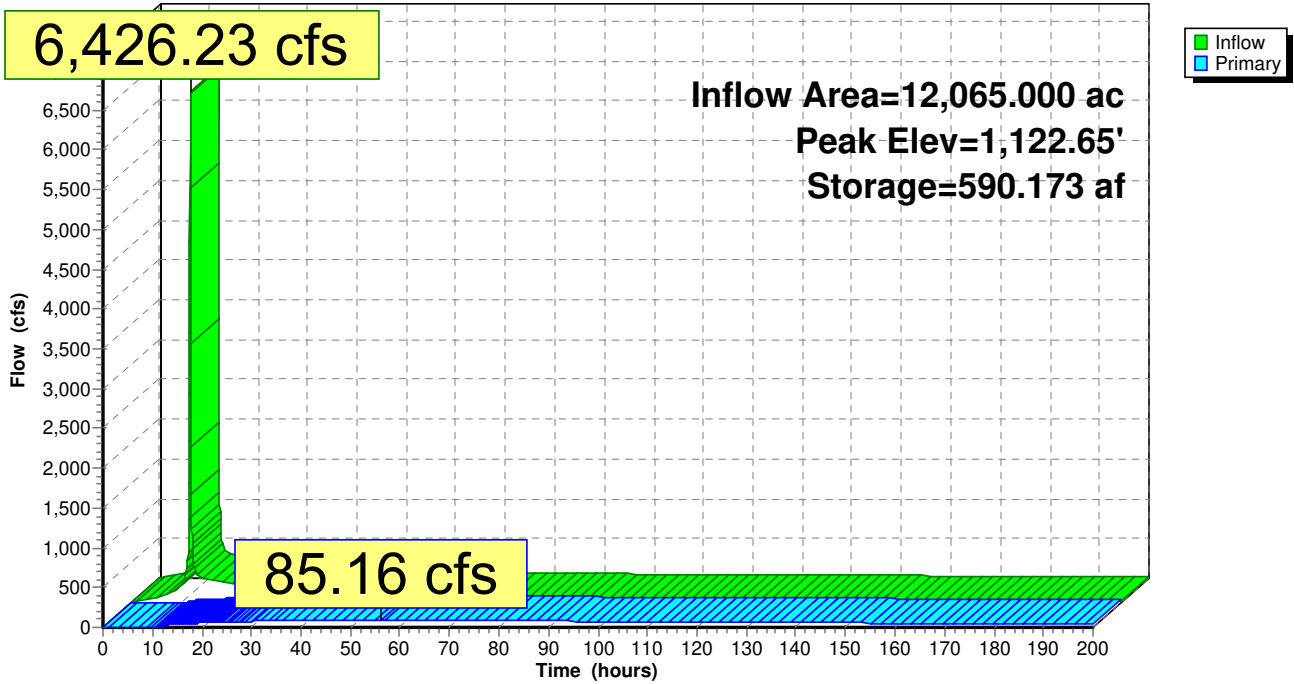
Device	Routing	Invert	Outlet Devices
#1	Primary	1,122.00'	60.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=85.16 cfs @ 56.13 hrs HW=1,122.65' (Free Discharge)

↑1=**Broad-Crested Rectangular Weir** (Weir Controls 85.16 cfs @ 2.17 fps)

Pond 3P:

Hydrograph



Appendix B

WiLMS Modeling Reports

Date: 1/9/2006 Scenario: 20

Lake Id: Upper Eau Claire Lake + Birch, Robinson, Smith, Sweet, Shunenberg
 Watershed Id: U. Eau Claire Lake Watershed

Hydrologic and Morphometric Data

Tributary Drainage Area: 4582.6 acre
 Total Unit Runoff: 14.00 in.
 Annual Runoff Volume: 5346.4 acre-ft
 Lake Surface Area <As>: 1379.0 acre
 Lake Volume <V>: 31690.0 acre-ft
 Lake Mean Depth <z>: 23.0 ft
 Precipitation - Evaporation: 6.4 in.
 Hydraulic Loading: 6081.8 acre-ft/year
 Areal Water Load <qs>: 4.4 ft/year
 Lake Flushing Rate <p>: 0.19 1/year
 Water Residence Time: 5.21 year
 Observed spring overturn total phosphorus (SPO): 9.0 mg/m³
 Observed growing season mean phosphorus (GSM): 12.0 mg/m³
 % NPS Change: 50%
 % PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre (ac)	Low Loading (kg/ha-year)	Most Likely Loading (kg/ha-year)	High Loading (kg/ha-year)	Loading %	Low Loading	Most Likely Loading	High Loading
Row Crop AG 0	0.0	0.50	1.00	3.00		0.0	0	0
Mixed AG 0	0.0	0.30	0.80	1.40		0.0	0	0
Pasture/Grass 25	82.3	0.10	0.30	0.50		2.2	5	15
HD Urban (1/8 Ac) 35	29.0	1.00	1.50	2.00		3.9	18	26
MD Urban (1/4 Ac) 278	571.7	0.30	0.50	0.80		25.4	104	174
Rural Res (>1 Ac) 69	452.3	0.05	0.10	0.25		4.0	14	27
Wetlands 4	67.3	0.10	0.10	0.10		0.6	4	4
Forest 369	3380.0	0.05	0.09	0.18		27.0	103	185
Lake Surface 558	1379.0	0.10	0.30	1.00		24.5	56	167

POINT SOURCE DATA

Point Sources	Water Load (m ³ /year)	Low Loading (kg/year)	Most Likely Loading (kg/year)	High Loading (kg/year)	Loading %
STP	0.0	20.0	40.0	55.0	5.9
Tomahawk	0.0	15.0	20.0	35.0	2.9
Rhinelanders	0.0	20.0	25.0	30.0	3.7
Madison	0.0	0.0	0.0	0.0	0.0

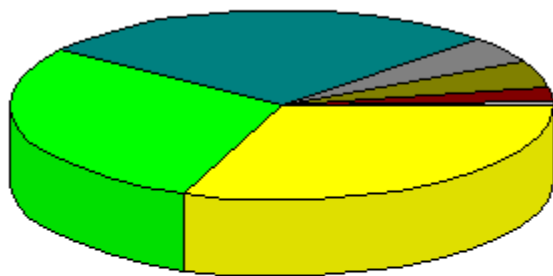
SEPTIC TANK DATA

Description	Low	Most Likely	High	Loading %
Septic Tank Output (kg/capita-year)	0.30	0.50	0.80	
# capita-years	0.0			
% Phosphorus Retained by Soil	98.0	90.0	80.0	
Septic Tank Loading (kg/year)	0.00	0.00	0.00	0.0

TOTALS DATA

Description	Low	Most Likely	High	Loading %
Total Loading (lb)	789.1	1507.0	3214.2	100.0
Total Loading (kg)	357.9	683.6	1458.0	100.0
Areal Loading (lb/ac-year)	0.57	1.09	2.33	
Areal Loading (mg/m ² -year)	64.14	122.49	261.26	
Total PS Loading (lb)	121.3	187.4	264.6	12.4
Total PS Loading (kg)	55.0	85.0	120.0	12.4
Total NPS Loading (lb)	544.8	950.5	1719.3	87.6
Total NPS Loading (kg)	247.1	431.1	779.9	87.6

Percent Phosphorus Load
Upper Eau Claire Lake + Birch, Robinson, Smith, Sweet, Shunenberg



0	Septic
0.6	Wetlands
2.2	Pasture/Grass
3.9	HD Urban (1/8 Ac)
4	Rural Res (>1 Ac)
24.5	Lake Surface
25.4	MD Urban (1/4 Ac)
27	Forest

Date: 1/9/2006 Scenario: 22
 Lake Id: Middle Eau Claire Lake + Bony Lake
 Watershed Id: M. Eau Claire Lake Watershed

Hydrologic and Morphometric Data

Tributary Drainage Area: 2227.8 acre
 Total Unit Runoff: 14.00 in.
 Annual Runoff Volume: 2599.1 acre-ft
 Lake Surface Area <As>: 1093 acre
 Lake Volume <V>: 19402 acre-ft
 Lake Mean Depth <z>: 17.8 ft
 Precipitation - Evaporation: 6.4 in.
 Hydraulic Loading: 3182.0 acre-ft/year
 Areal Water Load <qs>: 2.9 ft/year
 Lake Flushing Rate <p>: 0.16 1/year
 Water Residence Time: 6.10 year
 Observed spring overturn total phosphorus (SPO): 15 mg/m³
 Observed growing season mean phosphorus (GSM): 21 mg/m³
 % NPS Change: 50%
 % PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre (ac)	Low ----	Most Likely Loading (kg/ha-year)	High	Loading % ----	Low	Most Likely -----	High Loading
(kg/year) ----								
Row Crop AG 0	0.0	0.50	1.00	3.00		0.0	0	0
Mixed AG 0	0.0	0.30	0.80	1.40		0.0	0	0
Pasture/Grass 9	30.19	0.10	0.30	0.50		1.0	2	5
HD Urban (1/8 Ac) 150	123.3	1.00	1.50	2.00		21.2	75	112
MD Urban (1/4 Ac) 151	310.8	0.30	0.50	0.80		17.8	57	94
Rural Res (>1 Ac) 59	391.4	0.05	0.10	0.25		4.5	12	24
Wetlands 5	83.4	0.10	0.10	0.10		1.0	5	5
Forest 141	1288.7	0.05	0.09	0.18		13.3	39	70
Lake Surface 442	1093.0	0.10	0.30	1.00		25.1	44	133

POINT SOURCE DATA

Point Sources	Water Load (m ³ /year)	Low (kg/year)	Most Likely (kg/year)	High (kg/year)	Loading % =
STP	0.0	20.0	40.0	55.0	7.6
Tomahawk	0.0	15.0	20.0	35.0	3.8
Rhinelanders	0.0	20.0	25.0	30.0	4.7
Madison	0.0	0.0	0.0	0.0	0.0

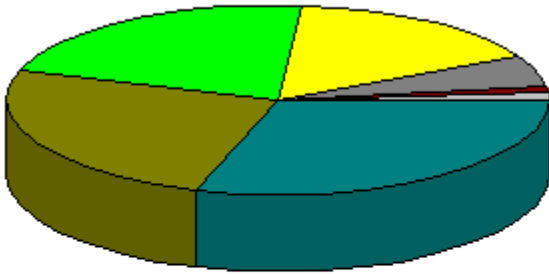
SEPTIC TANK DATA

Description	Low	Most Likely	High	Loading %
Septic Tank Output (kg/capita-year)	0.30	0.50	0.80	
# capita-years	0.0			
% Phosphorus Retained by Soil	98.0	90.0	80.0	
Septic Tank Loading (kg/year)	0.00	0.00	0.00	0.0

TOTALS DATA

Description	Low	Most Likely	High	Loading %
Total Loading (lb)	636.2	1166.3	2375.3	100.0
Total Loading (kg)	288.6	529.0	1077.4	100.0
Areal Loading (lb/ac-year)	0.58	1.07	2.17	
Areal Loading (mg/m ² -year)	65.24	119.61	243.58	
Total PS Loading (lb)	121.3	187.4	264.6	16.1
Total PS Loading (kg)	55.0	85.0	120.0	16.1
Total NPS Loading (lb)	417.4	686.4	1135.5	83.9
Total NPS Loading (kg)	189.3	311.3	515.1	83.9

**Percent Phosphorus Load
Middle Eau Claire Lake + Bony Lake**



0 Septic
1 Wetlands
1 Pasture/Grass
4.5 Rural Res (>1 Ac)
13.3 Forest
17.8 MD Urban (1/4 Ac)
21.2 HD Urban (1/8 Ac)
25.1 Lake Surface

Date: 1/9/2006 Scenario: 23

Lake Id: Lower Eau Claire Lake + Cranberry Lake
 Watershed Id: L. Eau Claire Lake Watershed

Hydrologic and Morphometric Data

Tributary Drainage Area: 1808.9 acre
 Total Unit Runoff: 14.00 in.
 Annual Runoff Volume: 2110.4 acre-ft
 Lake Surface Area <As>: 933 acre
 Lake Volume <V>: 17769 acre-ft
 Lake Mean Depth <z>: 19.0 ft
 Precipitation - Evaporation: 6.4 in.
 Hydraulic Loading: 2608.0 acre-ft/year
 Areal Water Load <qs>: 2.8 ft/year
 Lake Flushing Rate <p>: 0.15 1/year
 Water Residence Time: 6.81 year
 Observed spring overturn total phosphorus (SPO): 15.0 mg/m³
 Observed growing season mean phosphorus (GSM): 21.0 mg/m³
 % NPS Change: 50%
 % PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre (ac)	Low -----	Most Likely Loading (kg/ha-year)	High	Loading % -----	Low	Most Likely -----	High Loading
(kg/year) -----								
Row Crop AG 0	0.0	0.50	1.00	3.00		0.0	0	0
Mixed AG 0	0.0	0.30	0.80	1.40		0.0	0	0
Pasture/Grass 39	128.3	0.10	0.30	0.50		5.8	8	23
HD Urban (1/8 Ac) 55	45.3	1.00	1.50	2.00		10.2	27	41
MD Urban (1/4 Ac) 97	199.5	0.30	0.50	0.80		15.0	36	61
Rural Res (>1 Ac) 9	57.6	0.05	0.10	0.25		0.9	2	3
Wetlands 4	65.1	0.10	0.10	0.10		1.0	4	4
Forest 143	1313.1	0.05	0.09	0.18		17.8	40	72
Lake Surface 378	933.0	0.10	0.30	1.00		28.1	38	113

POINT SOURCE DATA

Point Sources	Water Load (m ³ /year)	Low (kg/year)	Most Likely (kg/year)	High (kg/year)	Loading % =
STP	0.0	20.0	40.0	55.0	9.9
Tomahawk	0.0	15.0	20.0	35.0	5.0
Rhinelanders	0.0	20.0	25.0	30.0	6.2
Madison	0.0	0.0	0.0	0.0	0.0

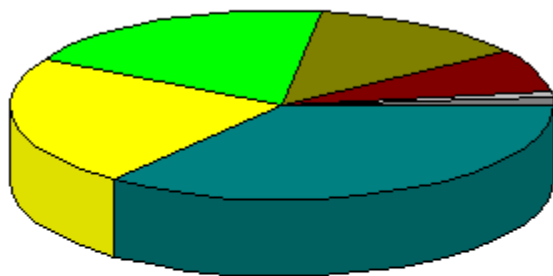
SEPTIC TANK DATA

Description	Low	Most Likely	High	Loading %
Septic Tank Output (kg/capita-year)	0.30	0.50	0.80	
# capita-years	0.0			
% Phosphorus Retained by Soil	98.0	90.0	80.0	
Septic Tank Loading (kg/year)	0.00	0.00	0.00	0.0

TOTALS DATA

Description	Low	Most Likely	High	Loading %
Total Loading (lb)	462.8	887.6	1862.0	100.0
Total Loading (kg)	209.9	402.6	844.6	100.0
Areal Loading (lb/ac-year)	0.50	0.95	2.00	
Areal Loading (mg/m ² -year)	55.60	106.64	223.69	
Total PS Loading (lb)	121.3	187.4	264.6	21.1
Total PS Loading (kg)	55.0	85.0	120.0	21.1
Total NPS Loading (lb)	258.3	450.5	765.0	78.9
Total NPS Loading (kg)	117.2	204.4	347.0	78.9

**Percent Phosphorus Load
Lower Eau Claire Lake + Cranberry Lake**



0	Septic
0.9	Rural Res (>1 Ac)
1	Wetlands
5.8	Pasture/Grass
10.2	HD Urban (1/8 Ac)
15	MD Urban (1/4 Ac)
17.8	Forest
28.1	Lake Surface

Appendix C

Guideline for Shoreline Protection in Bayfield County



**A Property Owner's Guide For
Protecting & Managing Shorelands in
*Bayfield County***

Contacts for your Shorelands Property Questions in Bayfield County

Questions About...

Who to Call...

Alterations to Your Shoreline.....	Bayfield County Zoning Department of Natural Resources
Aquatic Plants/Algae.....	Department of Natural Resources
Backyard Conservation.....	UW-Extension Department of Natural Resources
*Building/Remodeling.....	Bayfield County Zoning
County or Local Lake Association.....	Bayfield County Lakes Forum UW-Extension
*Cutting Trees & Shrubs.....	Bayfield County Zoning
*Driveways & Garages.....	Bayfield County Zoning
Fish & Wildlife.....	Department of Natural Resources
*Piers, Docks & Boathouses.....	Bayfield County Zoning Department of Natural Resources
Quiet Hours, Boat & Jet Ski Use.....	Your Township's Officials Bayfield County Sheriff
*Sanitary/Septic Requirements.....	Bayfield County Zoning
*Shoreline Buffer Protection or Restoration.....	Land Conservation Department Bayfield County Zoning UW-Extension
*Setback Requirements.....	Bayfield County Zoning
Yard Care & The Environment.....	UW-Extension

***IMPORTANT:** These activities may require a permit or have specific guidelines to follow. Please contact the appropriate agency for more information.

Bayfield County UW-Extension..... (715) 373-6104
www.uwex.edu/ces/cty/bayfield/ (click on Community Resource Development)

Bayfield County Land & Water Conservation Department..... (715) 682-7187

Department of Natural Resources †Ashland Office †Water Regulations & Zoning..... (715) 685-2923
www.dnr.state.wi.us/org/water/wm/dsfm/ (click on Shoreland Management)

Bayfield County Zoning..... (715) 373-6138
www.bayfieldcounty.org/zoning

Bayfield County Lakes Forum..... Email: bclf_2000@yahoo.com

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- Bayfield County Zoning Administration • Bayfield County Land Information Department
- Bayfield County Land & Water Conservation Department • Bayfield County Office - University of Wisconsin Extension

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This document is intended to provide general information regarding shoreland zoning requirements. Please check with the Bayfield County Zoning Department for specific and updated regulations that may apply to your property.

June 2004

A Property Owner's Guide For Protecting & Managing Shorelands in Bayfield County

Introduction

This guide is intended to provide information about shoreland regulations in Bayfield County, assist you in what to consider when buying shoreland property, and how to better manage these delicate natural systems through sound environmental practices.

As a shoreland owner, your responsibilities go beyond an individual property. How you care for your shoreland impacts an entire lake or river system.

Land Use Requirements

Land use is regulated in all shoreland areas in Bayfield County and throughout the townships with comprehensive zoning. Permitted uses vary from zoning district to district. Shoreland is all property within 1,000 feet of a lake, pond or flowage, or within 300 feet of a river or stream or to the landward side of a floodplain, whichever is greater. Therefore, it is recommended that the Zoning Office be consulted when purchasing or considering a building project or other property use.

Land Use Permits

Requirement. A land use permit shall be required for any new residence, any building erected, relocated or structurally altered, any change in the use of the land, or where any use of the land is altered. A land use permit shall be obtained prior to the initiation of construction or a change in land use from the Bayfield County Zoning Office.

Improvements to Nonconforming Structures. Exterior improvements and additions to nonconforming structures shall require a land use permit. Exterior improvements shall include, but not be limited to, structural alteration for installation of new doors and windows and the complete replacement of siding materials. Re-roofing without changing the pitch of the roof and installation of gutters are exempt from a land use permit.

Setback Compliance; Storage Shed Compliance. All structures shall meet prescribed setback standards for the zoning district in which they are located. All structures in floodplain areas shall require a land use permit. A land use permit shall not be required for a residential storage shed of less than two hundred (200) square feet in area. A temporary structure of more than two hundred (200) square feet shall require a temporary permit.

Sanitary Permits. A permit is required in ALL areas of the county for sanitary system installations, privy construction and sanitary system repairs. All installation and repair work on a sanitary system must be performed by a plumber licensed in the State of Wisconsin, and the permit must be obtained by him. Generally, the first step to implement lot development is to arrange for soil and site evaluation by a Certified Soil Tester. *A land use permit for a habitable building will not be issued until after the necessary sanitary permit is issued.*

An Overview of Watershed Management

The consequences of uncontrolled or unplanned development can be disastrous to land and water resources. Overbuilt and poorly designed shoreland areas degrade the value of the entire water body. Increasing demand for shoreline building sites has led to skyrocketing land costs; without controls, land with water frontage tends to be divided into smaller and smaller parcels. Marginal lands with high water tables or steep slopes fall under increasing development pressure after suitable lands are taken.

Overdevelopment increases the risks of lake pollution and scenic degradation. Nutrients such as nitrogen and phosphorus and improperly operating sewage treatment systems can contaminate wells and surface waters.

Sound management of our shorelands is important and will help maintain high water quality, sustained property values and the scenic quality of Bayfield County's lakes, rivers and streams.

Beginning in 1999, Bayfield County began development of a countywide land use plan, which in part was driven by lake and river development issues. The plan was completed and adopted by the County Board of Supervisors in 2003. An important element of the plan addresses shoreland development.

Shoreland Areas

Shoreland development within Bayfield County is currently regulated under the Bayfield County shoreland zoning ordinance. Development standards within the ordinance are based on the Bayfield County Lakes Classification System (see pages 4-7), which defines the vulnerability of water bodies based on environmental factors such as area, depth, and shoreline irregularity. The lakes classification system also considers existing development patterns in order to develop a shoreline development density factor.

Recommendations for the Residential Designation (Shoreland) are:

- 1) Encourage the formation of local lake property owners associations and support association activities aimed at protection of county water resources.
- 2) Encourage the use of shoreland buffers.
- 3) Support and enforce existing shoreland zoning ordinances.
- 4) Support the re-introduction of native shoreland vegetation to control and filter run-off and to stabilize the existing shoreline.

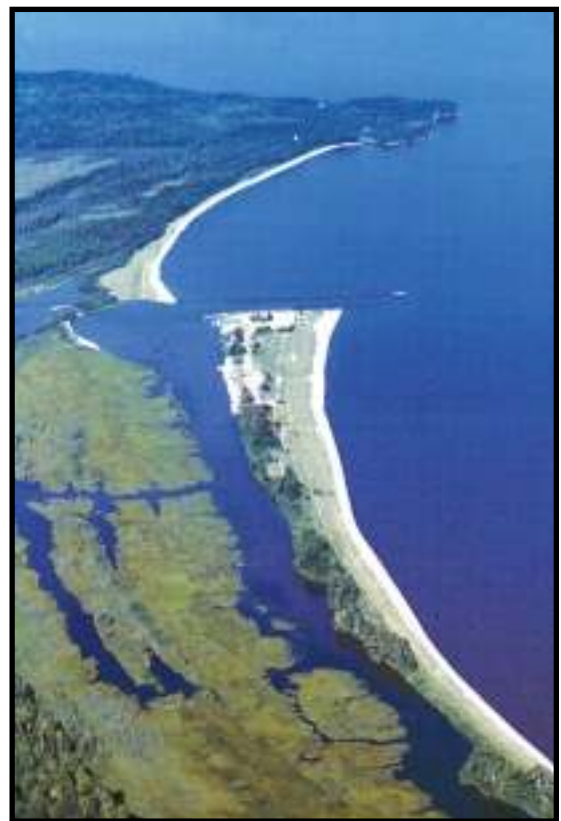


- 5) Development of restrictions/guidelines related to the use of fertilizers.
- 6) Creation of a Lake Superior shoreland zoning district. This district would reflect the unique features, processes, and environments of the Lake Superior coastline and should contain specific types of land uses allowed within the district, the type of development permitted for each land use, and coastal development standards. In lieu of developing a new zoning district, the county may wish to modify the current lakes classification system in order to include provisions for coastal resources.
- 7) Review existing shoreland zoning requirements based on the results of the shoreline recession study and develop new ordinances as appropriate.
- 8) Provide additional protection to unique coastal resources including estuaries, coastal barriers, and coastal wetlands through management, cooperative efforts with private landowners, and transfer into public ownership.

Bayfield County's Waters

Outlying Waters: Lake Superior

The Bayfield County mainland shore bordering Lake Superior is 86.2 miles in length, more than one-third of Wisconsin's Lake Superior shore. Four of the Apostle Islands (Eagle, Sand, York and Raspberry) are within the county's boundary. The combined area of the four islands is 3,470 acres, all of which is in public ownership. They have a total shoreline of 18.5 miles, all of which is public frontage.



Inland Surface Waters

The total inland surface water area of the county is 23,676 acres. Of this figure, 22,685 acres are the surface water area of

966 natural lakes and impoundments, and 991 acres are the surface area of 125 streams. Total stream length is 531.1 miles, of which trout streams comprise 429.8 miles. Frontage on both sides of streams totals 1,062.2 linear miles, with 381.9 miles in public ownership. Total lake shoreline totals 732.1 miles, of which 258.7 miles is in public ownership. Even though stream frontage is greater than lake frontage, the ratio of water area to frontage on streams is much less than that on lakes.

Bayfield County Lakes Classification

In order to provide a better management and protection tool for shoreland development, a lakes classification plan was developed and adopted for all lakes in the county. The plan measures a lake's sensitivity to development and provides different standards for different lake types.

Classification of Inland Lakes

Class 1 (Most Developed Lakes). Objectives:

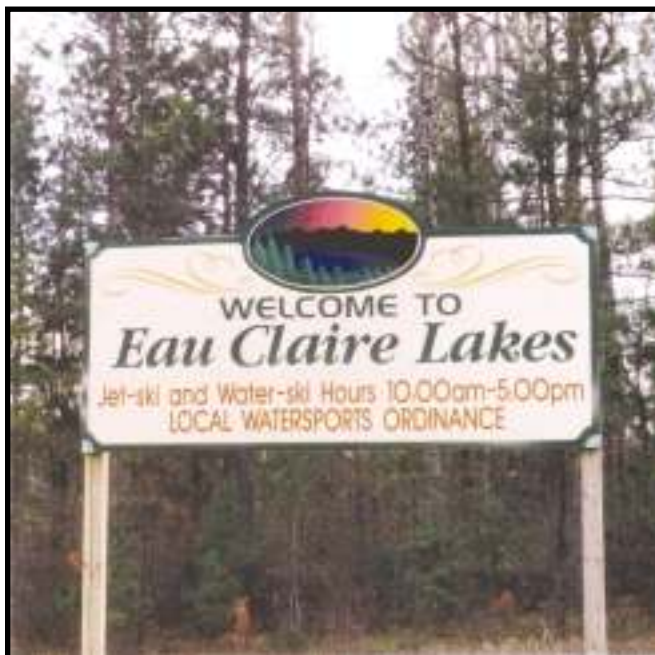
Preserve and enhance water quality to provide conditions for recreational use and aesthetics; retain existing natural shorelines and encourage restoration; acknowledge a mix of natural and developed shorelines; protect or restore a self-sustaining local ecosystem capable of supporting diverse native flora and fauna; promote peace and quiet; balance public and riparian interests in recreational uses.

Class 2 (Moderately Sensitive Lakes and Moderately Developed). Objectives:

Preserve and enhance water quality to provide conditions for recreational use and aesthetics; balance the current level of development with the sensitivity of these lakes to maintain and protect water quality; maintain and restore natural shoreline aesthetics and encourage restoration; identify and protect current natural and undeveloped areas; promote peace and quiet; protect or restore a self-sustaining local ecosystem capable of supporting diverse native flora and fauna; balance public and riparian interests in recreational uses.

Class 3 (Most Sensitive Developed and Undeveloped Lakes). Objectives:

Maintain and protect water quality; protect and restore the natural/wild appearance of shorelines and lands visible from the water; promote a quiet and peaceful experience; protect or restore a self-sustaining local ecosystem capable of supporting diverse native flora and fauna; discourage commercial use.



*The classification lists on the next three pages identify lakes named in **Surface Water Resources of Bayfield County**, published by Wisconsin Department of Natural Resources, and appearing by name on the 1:24,000 scale topographic maps, published by the U.S. Geological Survey, commonly referred to as the U.S.G.S. Quadrangle Maps.*

*All unnamed lakes listed in the **Surface Water Resources of Bayfield County**, Wisconsin Department of Natural Resources, and all named lakes 50 acres in size or less are considered Class 3 protection lakes.*

Class 1 Lakes

Lake Name	Section-TWP-Range
Atkins	19-44-5
Birch	4-44-9
Bony	4-44-9
Buskey Bay	28-47-8
Devils	16-44-9
Diamond	29-44-6
Eagle	3-46-8
Hart	27-47-8
Hilder	2-46-8
Lower Eau Claire	25-44-10
Middle Eau Claire	17-44-9
Millicent	28-47-8
Namekagon	10-43-6
Owen	14-44-7
Siskiwit	21-50-6
Swett	35-45-9
Trapper	27-44-6
Twin Bear	33-47-8
Upper Eau Claire	10-44-9

Class 2 Lakes

Lake Name	Section-TWP-Range
Ahmeek	26-47-9
Angus	10-47-8
Balsam Pond	19-45-7
Bark Bay Slough	35-51-7
Bass	28-46-7
Bellevue	29-46-7
Bibon	29-50-8
Birch	22-45-5
Buffalo	35-43-5
Bullhead	8-46-7
Cable	12-43-8
Camp One	4-46-7
Camp Two	4-46-7
Chippewa	15-43-5
Cisco	21-45-7
Club	13-44-6
Coffee	24-44-5
Cranberry	34-44-6
Crystal	15-47-9
Crystal	32-44-6
Deep	14-47-9
Dells	27-43-5
Delta	7-46-7
Drummond	29-45-7
Duck	13-43-5
Ellison	30-45-9
Esox	21-45-7
Everette	18-46-7
Hammil	25-44-8
Hay	7-46-7
Hollibar	17-46-7
Iron River Flowage	12-47-9

Class 2 Lakes (continued)

Lake Name	Section-TWP-Range
Iron	24-47-9
Island	18-45-9
Jackman	33-48-8
Jackson	33-44-6
Kelly	26-45-9
Kern	27-46-7
Knotting	21-44-6
Little Hidden	1-44-7
Little Star	11-45-7
Long	2-47-8
Marengo	34-45-5
McCarry	28-47-8
Muskellunge	4-46-8
Nymphia	14-45-7
Ole	27-43-8
Oriente Flowage	10-49-9
Overby	21-45-7
Perch	21-47-8
Perch	5-45-7
Pickereel	5-44-9
Pond	14-45-8
Porcupine	17-44-6
Richardson	23-47-9
Robinson	4-44-9
Rust Flowage	5-44-7
Ruth	31-47-8
Samoset	36-44-8
Sand Bar	20-45-9
Sawmill	9-46-7
Shunenberg	2-44-9
Smith	2-44-9
Spider	19-47-8
Spirit	12-46-8
Star	10-45-7
Tahkodah	34-44-7
Tars Pond	12-44-9
Tomahawk	20-45-9
Totogatic	32-43-8
White Bass	25-43-5
Wiley	1-43-8

Class 3 Lakes

Lake Name	Section-TWP-Range
Adeline	7-44-6
Anderson	1-45-8
Anodanta	15-45-7
Armstrong	20-45-7
Arrowhead	16-45-7
Bailey	26-48-8
Barnes	24-44-9
Bass	13-44-7
Bass	16-47-9
Bass	24-44-6
Bass	33-44-7

Class 3 Lakes (continued)

Lake Name	Section-TWP-Range
Bass	33-47-8
Bass	6-45-9
Basswood	13-46-8
Bear Pond	1-45-8
Bear	6-46-7
Bearsdale Spring (lower)	8-44-8
Bearsdale Spring (upper)	8-44-8
Beaver House	2-47-8
Beaver	32-46-7
Bell	12-46-8
Big Brook	28-44-8
Bismark	19-47-8
Bladder	31-48-7
Blazer Creek Springs	34-44-5
Blue	7-45-9
Bog	2-46-8
Breakfast	7-45-9
Buck	19-47-7
Bufo	6-45-7
Bullhead	20-45-7
Bullhead	29-44-5
Camp Eleven	28-47-9
Camp Nine	8-45-8
Camp Two	6-46-8
Camp	20-44-8
Canthook	15-46-8
Carroll	20-47-9
Carson Pond	17-46-7
Casper	20-43-5
Castle Creek Springs	34-44-5
Cat	28-47-8
Claire	5-45-8
Clay Conner	8-45-7
Conner	14-44-7
Cranberry	30-44-9
Cranberry	3-45-7
Crane	15-44-7
Crooked	26-47-8
Crystal	10-49-6
Dawn	9-43-8
De Champs Creek Spring	33-48-8
Deep	4-46-7
Deer	27-45-6
Dinner Camp	25-44-8
Dry Well	7-45-7
Ducetts	4-45-9
Duck	26-47-8
East Davis	11-44-6
East Eightmile	35-46-9
Egg	29-45-7
Eighteen Mile Creek Spring	18-44-6
Eko	36-49-6
Erick	34-47-9
Finger	32-47-7
Fire	5-47-8

Class 3 Lakes (continued)

Lake Name	Section-TWP-Range
Fish Creek Flowage	27-47-7
Fish Creek Spring	10-47-5
Five Island	34-47-8
Five	34-43-5
Flakefjord	5-45-7
Flynn	30-45-7
Flynn	3-46-8
Freibaurs	27-44-6
Frog	25-46-8
Fuller	33-43-8
George	18-45-9
Getsey	6-46-7
Ghost	20-43-5
Half Moon	17-47-8
Half Moon	24-44-8
Happles	9-46-8
Hay	18-45-9
Heart	7-46-7
Henderson	33-45-9
Henry	1-43-8
Hicks	11-47-8
Hidden	20-43-6
Hildebrandt	31-43-6
Hobbs	3-47-8
Hoist	2-48-7
Holly	25-44-8
Honey	18-47-7
Horseshoe	13-48-7
Horseshoe	19-44-7
Hostrassers	14-47-9
Hyatt Spring	5-44-8
Idlewild	6-44-9
Inch	3-46-8
Indian	23-45-5
Island	24-47-8
Jesse	26-47-9
JoAnn	15-43-7
Johnson Spring	22-45-7
Johnson	2-47-8
Jones	22-47-9
Lamereau	6-45-8
Lee	12-45-8
Lemon	8-46-7
Lenawee	12-49-7
Lerche	22-43-8
Lester	1-46-8
Lindgren	21-47-9
Line	33-46-7
Little Bass	7-43-5
Little Island	21-45-9
Little Siskwit	22-50-6
Lizzy	15-44-6
Long	6-48-5
Loon	12-47-8
Lost	21-47-8

Class 3 Lakes (continued)

Lake Name	Section-TWP-Range
Louise	10-47-6
Lund	5-45-7
McCloud	31-43-5
McGinnis	24-48-6
Mimi	20-44-9
Mirror	16-45-7
Mirror	6-47-7
Moon	18-47-8
Moose	5-48-6
Motyka	32-44-7
Mountain	28-45-8
Mud Flat	6-46-7
Mud	13-47-9
Mud	29-46-7
Mud	35-44-7
Mullenhoff	20-47-8
Muskie Springs	34-43-5
Mystery	6-46-7
Nancy	6-45-8
Nelson	18-45-7
Nokomis	30-47-7
Northeast	26-44-7
Ole	18-45-9
Olson	20-45-5
Osborn	33-45-6
Patsy	20-47-7
Perch	22-50-6
Perry	17-43-7
Peterson	16-47-8
Phantom	6-46-7
Physa	6-45-7
Picture	31-44-7
Pigeon	34-45-8
Pike	21-47-8
Pine	10-48-7
Pine	22-47-8
Planorbis	5-45-7
Pond	17-44-8
Porter	9-43-7
Pot	27-45-7
Preemption Creek Pond	11-44-6
Price	8-43-7
Priest	19-45-9
Rainbow	36-46-8
Rana	20-45-7
Range Line	36-43-5
Ree	28-44-6
Reynard	7-45-7
Rib	2-48-7
Rock	29-43-6
Roger	10-44-7
Roger	30-47-8
Rosa	6-44-7
Russell	22-47-9
Ryberg	23-44-7

Class 3 Lakes (continued)

Lake Name	Section-TWP-Range
Sage	6-44-6
Sawdust	8-47-7
Shunenberg Springs	4-44-8
Siegal	22-44-6
Silver Sack	26-48-8
Silver	9-46-8
Simpson	11-47-9
Siskiwit Springs	24-50-6
Sixteen	16-44-8
Smear	36-44-8
Southwest	31-44-6
Spider	22-47-7
Spring	11-47-9
Spring	32-43-6
Spruce	27-44-5
Square	22-46-8
Steckbaur	3-47-8
Steelhead	15-46-8
Stewart	18-44-7
Swede	12-46-8
Tank	11-43-6
Tank	20-45-6
Taylor	30-44-5
Tea Cup	29-46-7
Toothpick	31-47-7
Topside	12-47-8
Tower	25-46-8
Travers	6-45-8
Trout	4-46-8
Tub	32-47-7
Turtle	17-45-9
Twin (East)	36-49-6
Twin (North)	17-43-6
Twin (Northeast)	17-47-7
Twin (Northwest)	17-47-7
Twin (South)	20-43-6
Twin (Southwest)	17-47-7
Twin (West)	36-49-6
Twin	25-45-9
Two	19-46-7
Wabigon	13-45-8
Wanoka	20-47-7
Wentzel	13-47-8
West Davis	10-44-6
West Eightmile	34-46-9
West	14-46-8
West	22-43-8
Wilderness	6-45-8
Wilipyro	36-44-8
Wishbone	8-45-7
Wolf	4-46-7
Wright	27-47-9

Inland Lake Lot Requirements

	Class 1	Class 2	Class 3
Lot Size	30,000 sq ft	60,000 sq ft	120,000 sq ft
Lot Width	150 ft	200 ft	300 ft
Lot Depth	200 ft	300 ft	400 ft
Shoreline Setback	75 ft	75 ft	100 ft
Shoreline Vegetation Protection Area	50 ft	50 ft	75 ft
Side Yard Setback	10 min/ 40 min total	20 min/ 50 min total	30 min/ 60 min total



Lake Superior Lot Requirements

Lots having frontage on Lake Superior and any improvements thereon shall be subject to the requirements applicable to lots on Class 1 lakes, except that if a lot has a bank or a bluff fronting the lake, the top of which is discernible due to evidence of erosion, (including but not limited to exposed rock), the required shoreline setback shall be 75 feet back from the top edge of the bank or bluff, and if a lot is located in an area of active or potential erosion designated on a map entitled Erosion Hazard Areas-Bayfield County, a greater setback may be required as determined by the Zoning Committee or its duly designated agent, based on projected shoreland recession rates.

Lots on Rivers and Streams

Lots adjoining or including rivers or streams shall meet the following minimum requirements:

Lot Size	120,000 square feet
Lot Width	300 feet
Shoreline Setback	100 feet
Lot Depth	400 feet
Side Yard Setback	30 feet/60 feet total
Shoreline Vegetation Protection Area	75 feet
View Corridor	30 feet

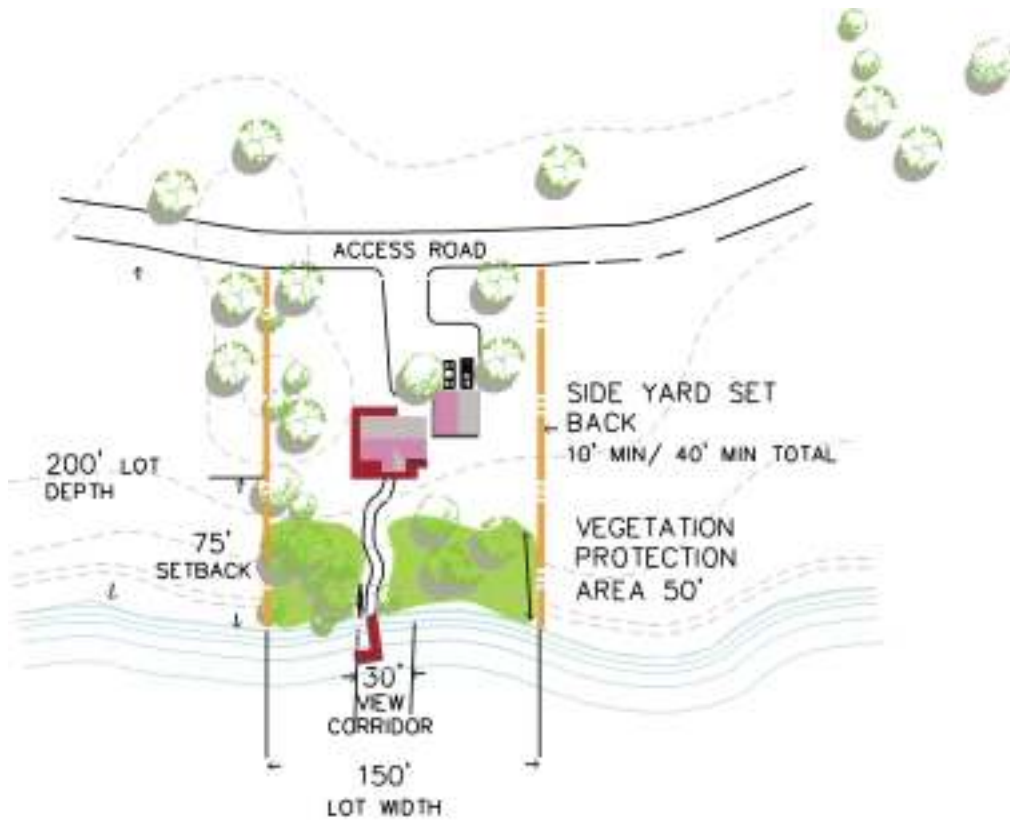
Planned Unit Developments and Other Multiple Unit Developments

	Class 1 Lakes & Lake Superior	Class 2 Lakes	Class 3 Lakes, Rivers & Streams
Shoreline Frontage	150 feet for every 4 dwelling units; 600 feet minimum	200 feet for every 3 dwelling units; 800 feet minimum	300 feet for every 2 dwelling units; 1,200 feet minimum
Open Space	30,000 square feet per dwelling unit	60,000 square feet per dwelling unit	120,000 square feet per dwelling unit
Open Space in UVOD	7,500 square feet per dwelling unit	15,000 square feet per dwelling unit	30,000 square feet per dwelling unit
Open Space Public Sewer System	10,000 square feet per dwelling unit	20,000 square feet per dwelling unit	40,000 square feet per dwelling unit
Shoreline Setback	200 feet	200 feet	225 feet
Viewing Corridors	20% of frontage	15% of frontage	10% of frontage

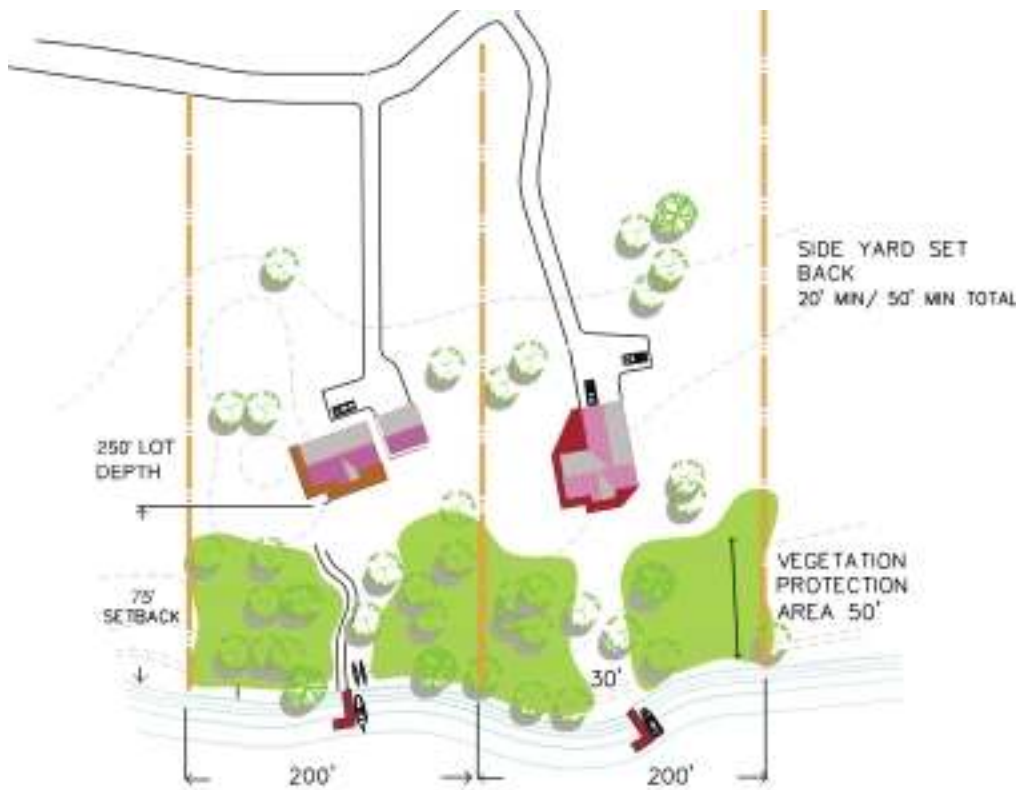


Backlot Access to Waters

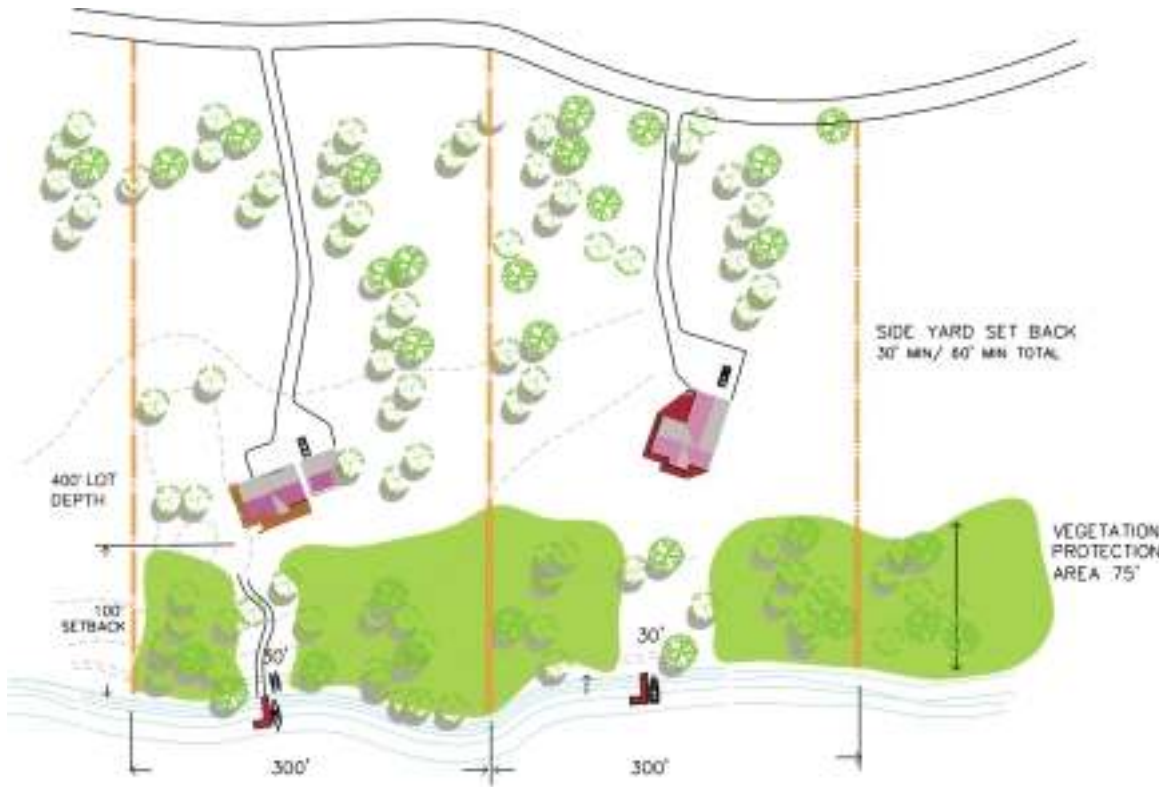
Except for waterfront lots on Lake Superior in RRB or Commercial zoning districts, the use of waterfront lots to provide deeded shoreline access to back lots is specifically prohibited, and no land division shall be recorded and no land use permit(s) shall be issued for a waterfront parcel unless the minimum lot area, width and water frontage are provided for each dwelling unit which is located or proposed to be located on the waterfront property or located on a back lot where the owner has a deeded interest in the waterfront property.



CLASS 1 LAKES · MINIMUM REQUIREMENTS
30,000 Square Feet

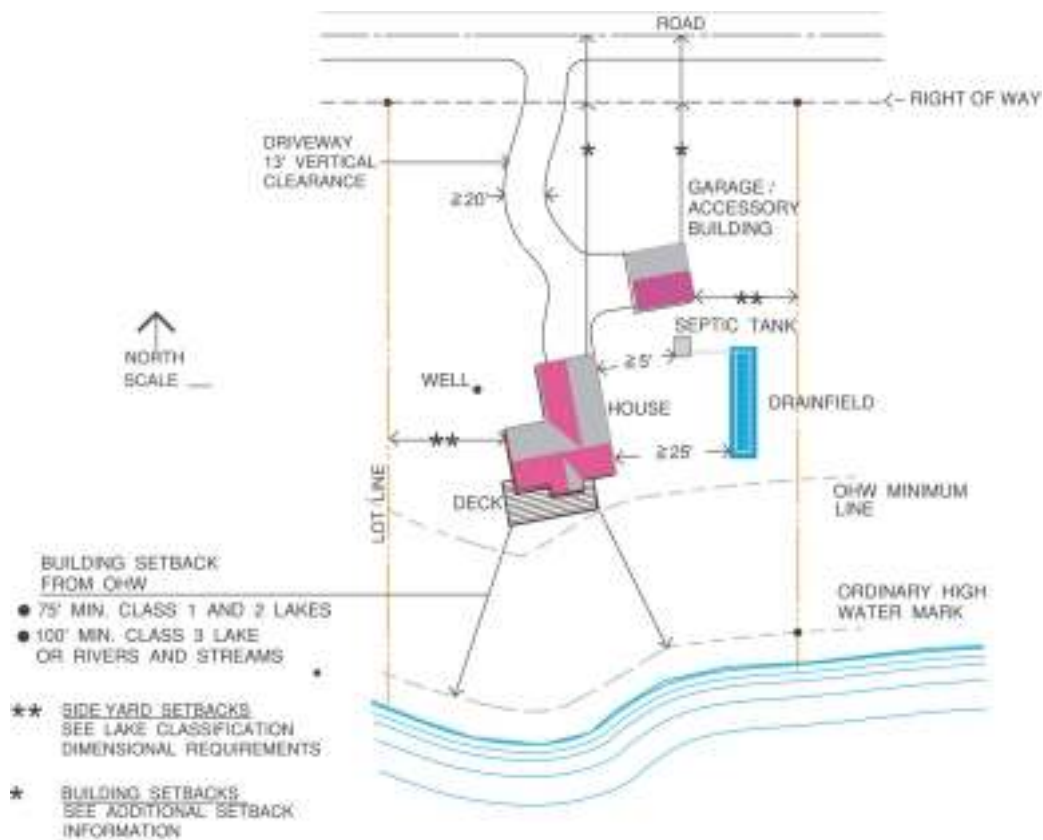


CLASS 2 LAKES · MINIMUM REQUIREMENTS
60,000 Square Feet



CLASS 3 LAKES · MINIMUM REQUIREMENTS

120,000 Square Feet



EXAMPLE OF PLOT PLAN NEEDED FOR PERMIT

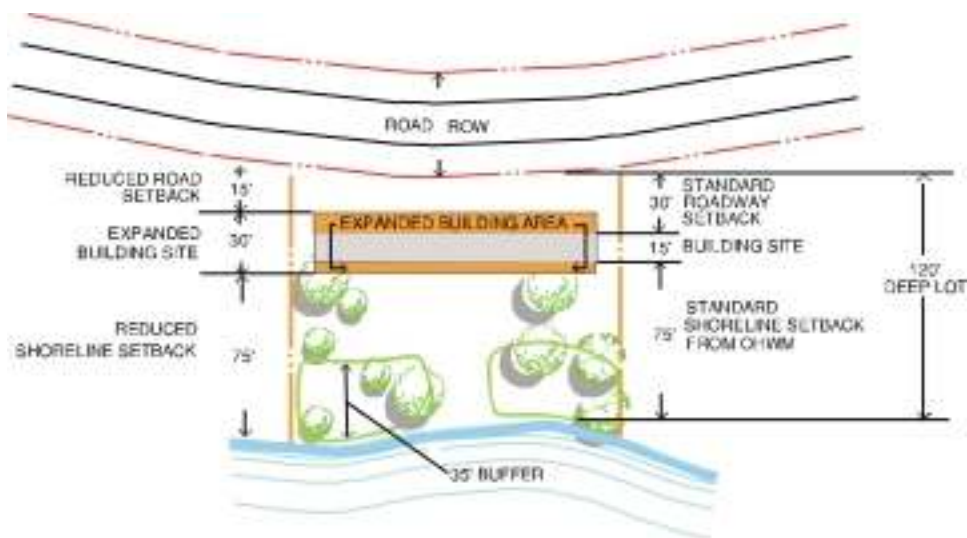
Shoreland Regulations in Bayfield County That Affect Your Waterfront Property Shoreline Setbacks

Reduced Roadway, Rear Yard and Shoreline Setbacks for Undeveloped and Redeveloped Lots of Record.

Nonconforming Plats. If a lot platted prior to December 12, 2000, is not deep enough to accommodate required roadway or rear yard and shoreline setbacks, the roadway or rear yard setback may be reduced until a thirty-foot deep building site is established provided the resulting setback is not less than one-half the distance of the required setback. In such case, in order to avoid visual and other obstructions, no garage doorway may open toward and no parking area may be located in the reduced roadway setback area.

Shoreland Adjustment. If the road or rear yard setback reduction above does not provide a thirty-foot deep building site, the shoreline setback may then be reduced until a thirty-foot deep building site is established provided the resulting shoreline setback is not less than two-thirds the distance of the required setback.

Mitigation. A property owner shall comply with the mitigation requirements in order to qualify for the setback reductions.



REDUCED ROADWAY AND SHORELINE SETBACKS FOR UNDEVELOPED NONCONFORMING LOTS

Additional Setback Information

Highway Setbacks:

Class of Highway	Setback from Centerline	Setback from Right of Way Line
State & Federal	110	50 , whichever is greater
County	75	42 , whichever is greater
Town	63	30 , whichever is greater

Stairways and Piers. Stairways, elevated walkways and that portion of piers landward of the ordinary high water mark are exempted from the shoreline setback requirement provided:

- The structure is necessary to access the shoreline because of steep slopes or wet, unstable soils.
- The structure shall be located so as to minimize earth disturbing activities and shoreline vegetation removal during construction and to be visually inconspicuous as viewed from the adjacent waterway and public thoroughfares.
- The structure shall be no more than four (4) feet wide.
- Structures shall be inconspicuously colored.
- Railings are permitted only where required by safety concerns.
- Canopies and roofs on such structures are prohibited.
- Landings for stairways or docks are permitted only where required by safety concerns and shall not exceed forty (40) square feet.
- No stairway, landing, elevated walkway, or similar structure shall be constructed without a land use permit having been issued, and any such structure shall be constructed in accordance with best management practices for minimizing adverse impact on the shoreland area and adjoining water. In determining whether a structure will comply with best management practices the Zoning Department may seek the assistance of the county land conservationist.

Greater Setbacks. In cases of adverse soil to topographical conditions, the Zoning Administrator and/or Zoning Committee may require greater setbacks.

Intermittent Streams. No structure shall be constructed or placed within 25 feet of the top edge of the eroded bank of an intermittent stream.

Wetlands. No structure shall be constructed or placed within 25 feet of a mapped wetland two acres or greater in area.

Measurements. All setbacks shall be measured horizontally. Structural setbacks shall be measured from the furthest extension of the structure (including eaves and decks) to the closest point of the line in question.



EXAMPLE OF STAIRWAY
REQUIRING LAND USE PERMIT



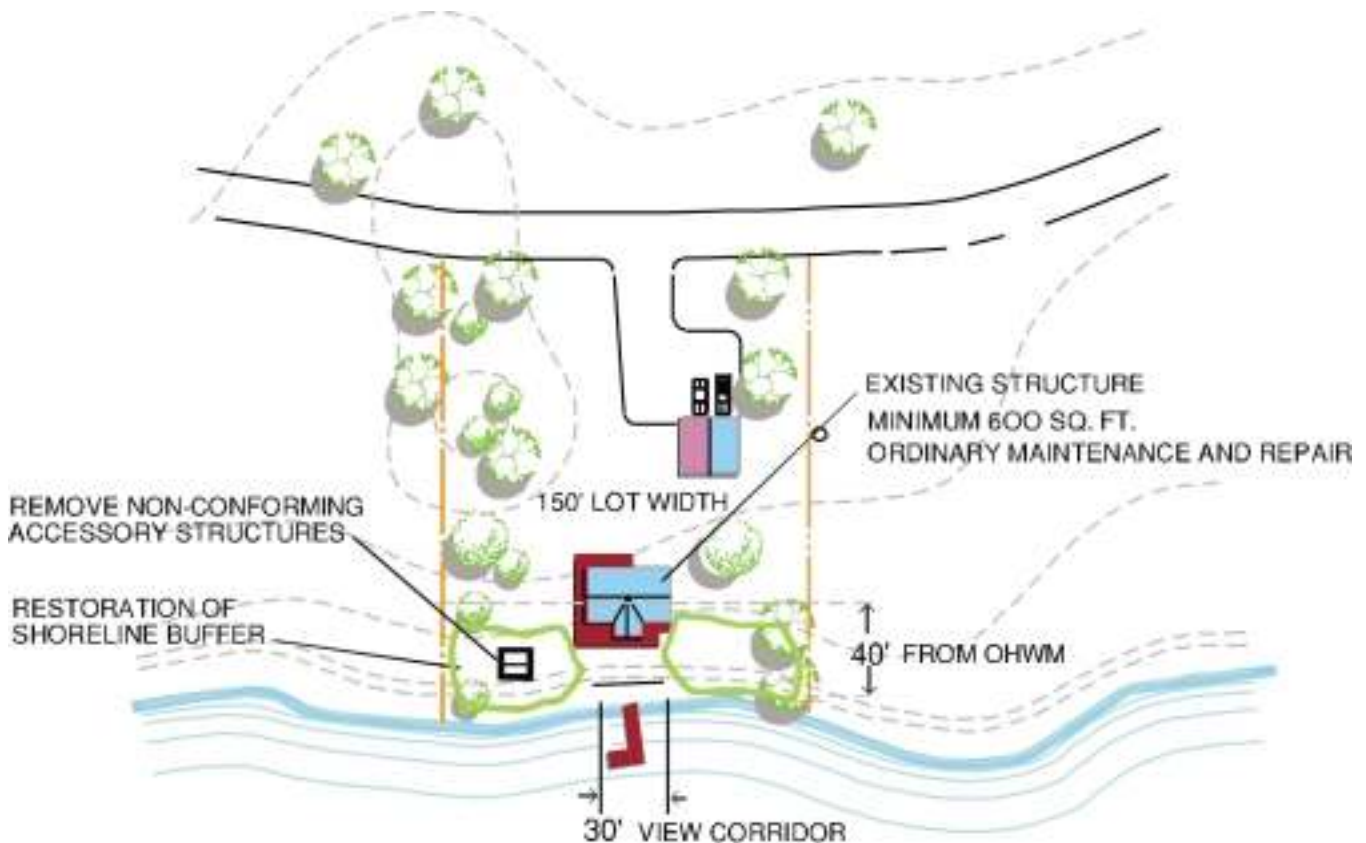
Standards for Nonconforming Structures

A nonconforming structure refers to a structure which was existing prior to the adoption of an ordinance and which does not meet the requirements of the new ordinance. The dimensions, location or other physical characteristics of the structure do not conform to the standards of the zoning ordinance and therefore it is considered nonconforming.

The standards for nonconforming structures recognize the need to allow for some improvement to structures while not allowing major construction that results in replacement of structures that do not meet setback requirements.

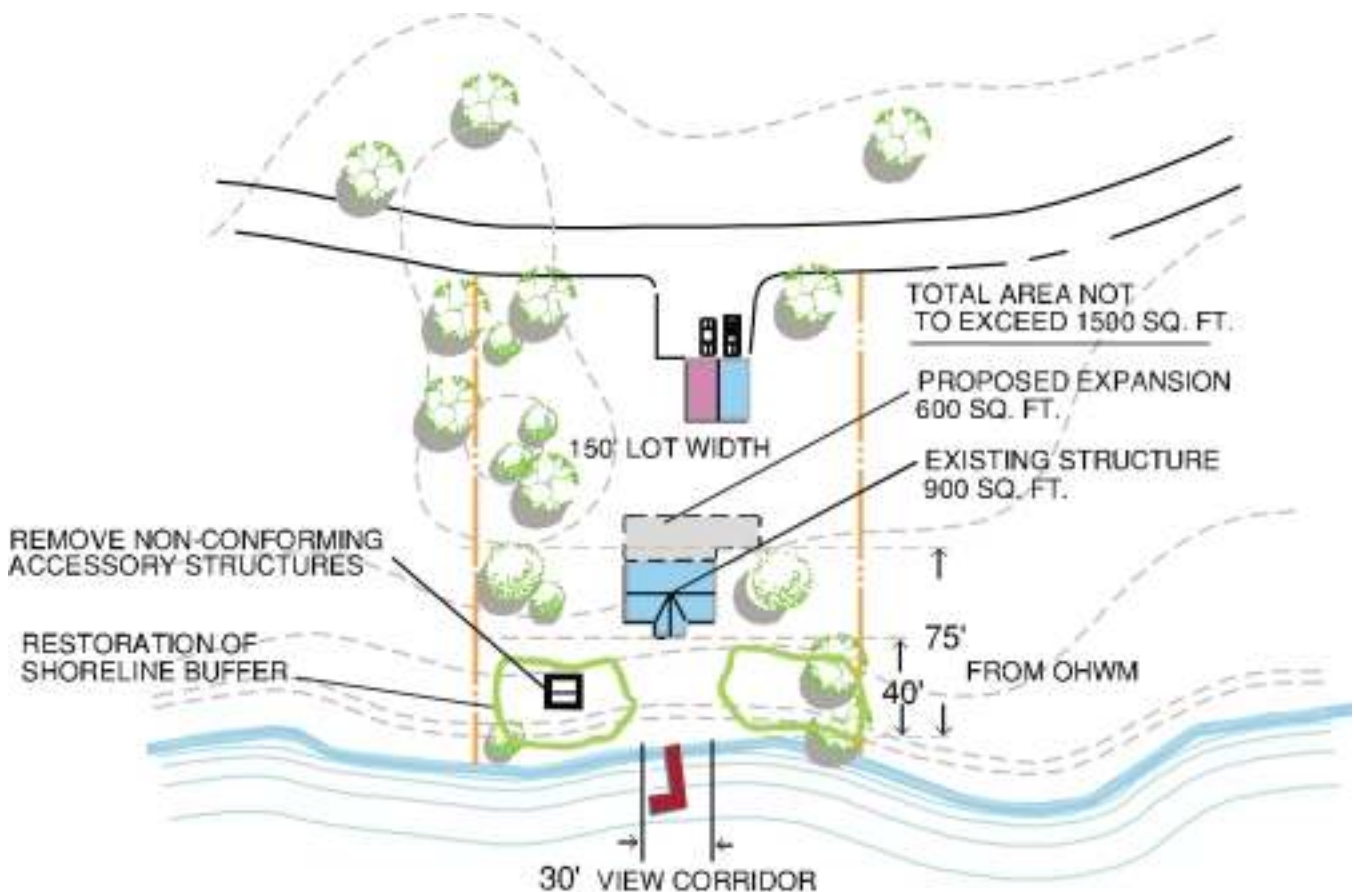
Structures Located Less Than 40 Feet From the Ordinary High Water Mark and Have a Minimum of 600 Square Feet Enclosed Dwelling Space:

- Internal improvements shall be confined to the building envelope and may be constructed without a land use permit.
- No new basements, additional stories, other expansion, or accessory construction outside the perimeter of the existing enclosed dwelling space shall be permitted.
- Exterior improvements shall be limited to structural alterations for the replacement or addition of doors, windows, the replacement of a flat roof with a pitched roof, and/or the complete replacement of siding materials. They shall require a land use permit.
- Mitigation requirements are met.



Structures Located Between 40 Feet and 75 Feet From the Ordinary High Water Mark and Having a Minimum of 600 Square Feet of Enclosed Dwelling Space, One Addition Shall Be Permitted:

- The resulting structure shall not exceed twenty-six (26) feet in height.
- The addition shall be within the existing footprint or landward thereof and shall not increase the existing footprint by more than fifty percent (50%) nor increase the resulting footprint (of the existing structure and addition combined) beyond one thousand five hundred (1,500) square feet (but this provision does not prohibit an addition to a structure whose existing footprint is more than one thousand five hundred (1,500) square feet if the addition does not increase the footprint).
- The resulting structure shall not exceed one thousand nine hundred (1,900) square feet of roof overhang (measured in a horizontal plane).
- The resulting structure shall not exceed two thousand five hundred (2,500) square feet of enclosed dwelling space (measured for all stories excluding the basement).
- No new or raised basement for the existing structure or any attached accessory structure shall be permitted, though a basement may be constructed under a permitted lateral addition.
- Any expansion or exterior improvement shall require a land use permit.
- Mitigation requirements are met.





Structures Located Between 20 Feet and 40 Feet From the Ordinary High Water Mark and Having a Minimum of 600 Square Feet of Enclosed Dwelling Space, One Addition Shall Be Permitted:

- Not exceeding one hundred seventy-five (175) square feet of enclosed dwelling space and located on the landward side of the structure.
- Shall be permitted if the resulting structure's height does not exceed twenty-six (26) feet, its footprint does not exceed one thousand five hundred (1,500) square feet.
- Its roof overhang does not exceed one thousand nine hundred (1,900) square feet.
- Its enclosed dwelling space does not exceed two thousand five hundred (2,500) square feet.
- A plan meeting all of the following requirements is submitted to and approved by the Bayfield County Zoning Department and is fully implemented and complied with:
 - ¥ The septic system shall be upgraded in accordance with COM 83, Wis. Adm. Code, and the Bayfield County Sanitary Private Sewage Ordinance.
 - ¥ Water runoff from the structure shall be handled in accordance with best management practices.
 - ¥ A shoreline vegetation protection area shall be established and maintained for not less than one-half the distance from the ordinary high water mark to the structure. Any natural vegetation located closer to the structure than one-half the distance from the ordinary high water mark shall also be maintained.
- Mitigation Requirements are met.

Structures Located on Class 3 Lakes or Rivers and Streams Between 75 Feet and 100 Feet From the Ordinary High Water Mark, Improvements & Expansions Shall Be Permitted:

- Upon the issuance of a land use permit to the same extent as if they were conforming structures, provided that:
 - ¥ Any addition is located no closer to the ordinary high water mark than the existing structure.
 - ¥ Mitigation requirements are met.

Mitigation Measures

Mitigation is required to compensate for lost shore buffer area functions when nonconforming structures are improved or expanded within the shore setback area. A site plan and implementation schedule describing any required mitigation shall be submitted by the property owner or owner's authorized agent and approved by the Zoning Department prior to issuance of the related land use permit(s). Mandatory mitigation measures shall include:

- Evaluation and upgrading of any existing sanitary system on the subject property to comply with COM 83, Wis. Adm. Code, and the Bayfield County Sanitary and Private Sewage Ordinance.
- Implementation of erosion and storm water runoff control measures in accordance with best management practices.
- Accumulating at least four (4) points from among the following proposed or current practices:
 - 1 Point ¥ Restoration or maintenance of a shoreline vegetation protection area within twenty-five (25) feet of the ordinary high water mark (OHWM).
 - 2 Points ¥ Restoration or maintenance of a shoreline vegetation protection area within forty (40) feet of the OHWM.
 - 3 Points ¥ Restoration or maintenance of a shoreline vegetation protection area within seventy-five (75) feet of the OHWM.
 - 1 Point ¥ Restoration of native vegetation along both side yards.
 - 1 Point ¥ Removal of nonconforming accessory buildings from the shoreline setback area.
Per Bldg
 - 1/2 Point ¥ Use of exterior building materials or treatments that are inconspicuous and blend with the natural setting of the site.
 - 1/2 Point ¥ Compliance with any shoreland exterior lighting requirements that may be adopted.
 - ¥ Other practices agreed upon by the Zoning Department (seawall removal, removal of excessive dockage and mooring, removal of artificial sand beaches, etc.).
Points as determined by the Zoning Department

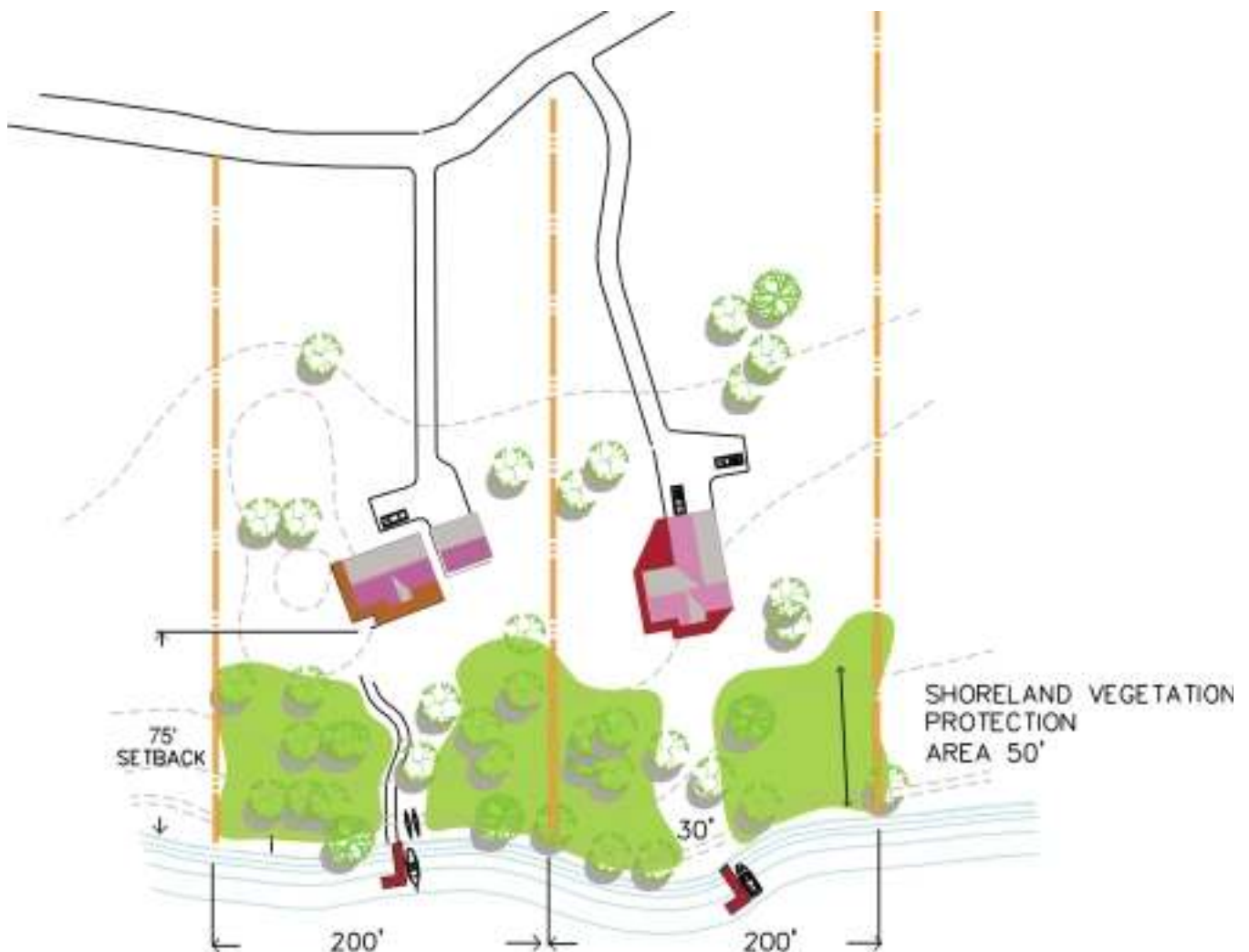
In exchange for permitting an addition to a nonconforming structure, mitigation is required to restore the natural values of a shoreline. The goal of these mitigation requirements is to restore the benefits of a healthy, functioning buffer zone. Benefits of mitigation include:

- ★ A shoreline rich in diverse vegetation to curb runoff and enhance wildlife habitat.
- ★ A shoreline where structures blend in with natural surroundings thereby enhancing aesthetic beauty.
- ★ An upgraded septic system that meets water quality standards.

Shoreland Vegetation Protection Areas

There shall be a shoreland vegetation protection area on each lot adjoining or including navigable water extending from the ordinary high water mark to a line that is 25 feet closer to the ordinary high water mark than the required shoreline setback. Within such area, the removal of trees, shrubs, and ground cover and land disturbing activities are prohibited with the following exceptions:

- One viewing corridor for each lot may be established by pruning and selective removal of trees and shrubbery. Clear cutting, filling, grading, and other land disturbing activities are prohibited.
- Sufficient trees and shrubbery shall be retained to screen development from view from the water.
- The viewing corridor shall be more or less perpendicular to the shore, no more than 30 feet wide in the dimension paralleling the shore, and shall be set back at least ten (10) feet from each side lot line.
- For lots with less than 100 feet of frontage, the width of the viewing corridor shall be no more than 30% of the frontage.
- No fences shall be allowed in the shoreland vegetation protection area.

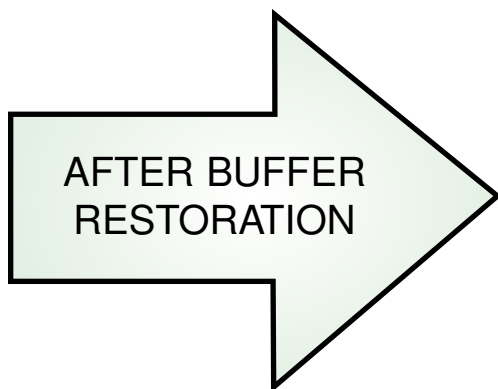
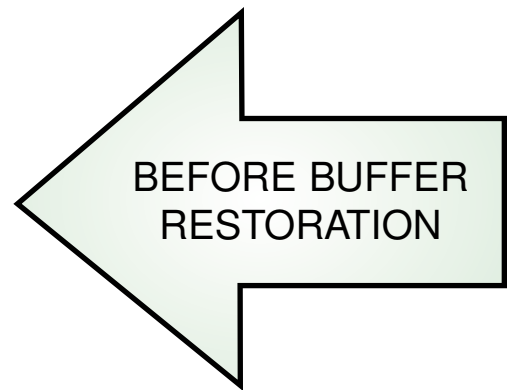


Maintaining and Restoring Your Vegetative Shoreline Buffer

Shoreline Buffer Restoration

Definition:

A shoreline buffer is a zone of native vegetation that extends from the ordinary high water mark inland. A buffer restoration design seeks to restore functions provided by the original, natural vegetation. Buffers of vegetation provide habitat, hold soil in place, intercept and purify runoff water, and provide natural beauty.



Evaluating Your Shoreland Property

Physical Characteristics

■ **Parcel Size.** The lot should be large enough to accommodate your intended use, as well as comply with the local zoning requirements. Lots that have been created since the statewide shoreland zoning standards took effect are large enough for most residential uses and comply with local zoning requirements. However, there are many lots that were created prior to the shoreland rules that may be substantially smaller than the new lot size requirements. These substandard lots may still be bought and sold if separately owned, but they may be too small to accommodate a structure or a sewage treatment system. If you are considering buying such a lot, you should carefully review your intended use and the limitations of the property.

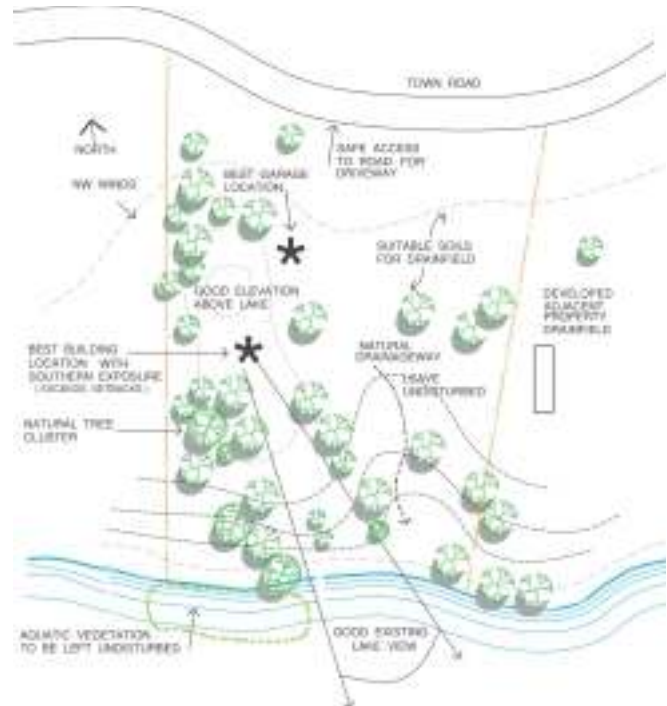
■ **Parcel Shape.** Although the size of the lot may meet zoning requirements, the shape can restrict the use and location of structures. Long, narrow lots or pie-shaped lots may make it difficult to meet some of the requirements for setbacks, lot widths and sewage treatment systems. Carefully consider the compatibility of a lot shape with your intended use.

■ **Topography.** Land surface elevations are important for several reasons. First, the lot should be high enough so that the dwelling will not be flooded by water level fluctuations. The site should be able to accommodate the lowest portion of the building, including the basement, at least three feet above the highest known water level. The site must also accommodate an on-site sewage treatment system and enough room for an alternate system. It is necessary to have a qualified professional determine if a site can accommodate a standard sewage system.

■ **Soil Conditions.** The soils should be suitable for your intended use as both structures and sewage treatment systems have specific requirements. Wet or clay soils are generally unsuitable for soil absorption sewage treatment systems and can also make building construction difficult.

■ **Vegetation.** The aesthetic and ecological value of shoreland property is linked to the type and quality of existing vegetation. Large trees and wooded landscapes are attractive and help to screen structures from the lake. Shoreland zoning ordinances regulate the amount of vegetation that can be removed. The natural vegetation gives you clues as to the suitability of your intended use. Inventory the types of trees on the property; remember white birch and aspen tend to be short lived compared to oak and maple.

■ **Parcel Orientation.** Generally, the most desirable orientation is south or west which provides daytime sun and off-lake breezes. Remember, deciduous trees such as oak, maple, etc., will allow sun in the winter while pines will provide year-round shade.



- **Adjacent Development.** Locate adjacent properties waste treatment systems and wells to determine setback restrictions on your property and consider side-yard setbacks and privacy.
- **Potential Building Sites.** After an analysis of your site, select an appropriate location for your building based on the above factors. Remember the best building sites in many cases are back beyond the required minimum setback. A maximum height restriction of the structure measured from the lowest exposed point on the foundation to the highest point on the roof is 35 .



Shoreland Lighting

All outdoor lighting on shoreland lots which is within 300 feet of the ordinary high water mark shall meet the following requirements:

- Lighting shall be controlled so as not to shine up into the sky or onto any neighboring property or onto navigable waters. This may be accomplished by use of fully shielded cut-off fixtures, directing light fixtures downward rather than upward, or by other similarly effective means.
- Where lighting is for security purposes or to illuminate walkways, roadways, equipment yards or parking lots, only fully shielded cut-off style light fixtures shall be used.
- All illuminated signs for commercial purposes visible from navigable waters shall be turned off between 11:00 p.m. and sunrise except that signs may be illuminated while the business facility is open to the public.
- All forms of flashing, rotating, or moving lights shall be prohibited.

Filling † Grading † Dredging † Lagooning

- **General Requirements.** Only filling, grading, dredging, lagooning, ditching, and excavating which is done in a manner designed to minimize erosion, sedimentation and impairment of fish and wildlife habitat and which is accomplished in conformity with all applicable federal, state and local laws is permissible in the shoreland.
- **Lake Superior.** A special land use permit shall be required for excavating, grading, or filling of two hundred (200) square feet or more within one thousand (1,000) feet of the ordinary high water mark of Lake Superior (roadway maintenance exempt).
- **Filling.** A special land use permit shall be required for the filling of five hundred (500) square feet or more of any wetland. In addition, a permit may be required from the Department of Natural Resources under Ch. 30, Wis. Stats, or from any other state agency having jurisdiction.
- **Grading.** A special land use permit shall be required for the grading or filling of one thousand (1,000) square feet or more within a strip paralleling the shoreland and extending inland three hundred (300) feet from the ordinary high water mark (roadway maintenance exempt).

Long Term Best Management Practices

Follow these long-term BMPs to minimize runoff and prevent sediments from going into the lake:

- Limit hard surface and covered areas that prevent water from seeping into the ground.
- Provide permanent stabilization practices for long-term protection of your shoreland property by planting new vegetation and diverting drainage away from the lake whenever possible.
- Retain native trees and shrubs, as trees provide a natural umbrella by shedding water and can reduce runoff by as much as 50%.
- Limit clearing and grading on slopes which drain to the water and minimize cutting and filling for roads, driveways, sidewalks, stairways and footpaths to reduce erosion and still provide adequate access.



Why Is Runoff A Problem?

The way water flows is changed when an area is developed or the landscape is altered. Covering land surfaces with roads, driveways or impervious surfaces (rooftops, decks, walkways and parking lots), causes less water to seep into the soil, increasing runoff. This increased runoff is usually channeled into ditches, drainageways or downslope towards nearby lakes and streams.

High flows of water often cause flooding or erosion, increasing sediment in streams and lakes. Fine sediment can transport nutrients such as nitrates or phosphorus. All of these processes have an adverse effect on water quality and the lake's environment.

Follow these guidelines for erosion control during and after construction. Erosion control practices must be installed PRIOR to any land disturbing activities and must remain in place until the site is stabilized (no bare soil).

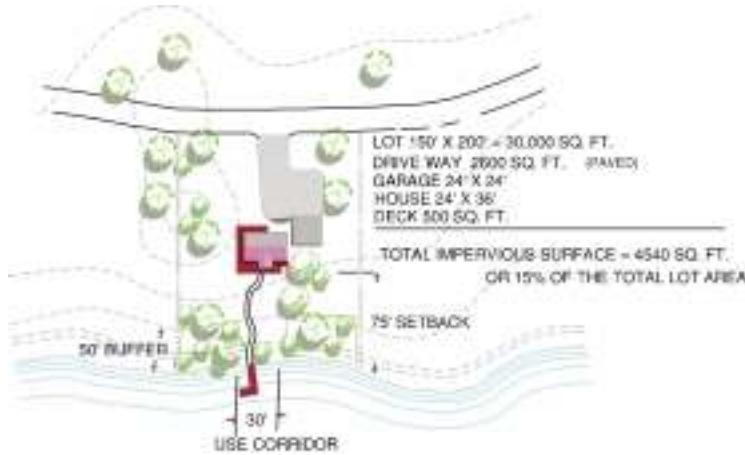
- **Minimize disturbance of the existing groundcover layer** to avoid soil erosion.



- **Keep the construction site covered with a hay or straw mulch** immediately after seeding or reseeded.
- **Consider working only in a small area** and stabilizing that site before disturbing another.
- **Protect groups of trees from heavy equipment by encasing them** with snowfence. Avoid compacting soil above tree roots by excluding heavy equipment and not stockpiling building materials over roots.
- **Maintain a filter strip of natural vegetation** along the banks of lakes and streams; the best filter strips are native trees with undisturbed native understory plants.

Impervious Surfaces

Impervious surfaces such as asphalt pavement and building roofs result in increased volumes and velocities of stormwater runoff. This runoff carries nutrients, sediment and other pollutants as it flows toward the lake or river. Limits on the amount of impervious surfaces on a shoreland lot reduce the potential for runoff that adversely effects the water quality and provide areas for the retention and infiltration of runoff. Natural shoreland buffer zones are encouraged for their effectiveness in handling runoff.



IMPERVIOUS SURFACE LIMITATIONS

Requirements. That part of a shoreland lot within 300 feet of the ordinary high water mark shall not contain more than 4,500 square feet or 15% of impervious surfaces, whichever is greater, except pursuant to a fully implemented storm water management plan approved by the Department and providing that there will be no increase in storm water discharge from the lot as a result of the construction for storms up to and including the 10-year 24-hour storm event. Such plan shall be certified by a registered professional engineer or, at the County's option, the applicant shall provide funds to defray the costs of County preparation of the plan.

Access Roads, Driveways & Sidewalks

- Minimize the amount of impervious surfaces.
- Use gravel driveways instead of asphalt or concrete pavement.
- Where paved areas are necessary, locate them as close to the main road as possible to minimize the length of paved driveway and keep the paved areas as far from the water as possible.
- Because steeper slopes have greater erosion potential, locate driveways, sidewalks, stairways and footpaths away from slopes. Follow the contour of the slope if your walkway goes across a hillside.
- Use steps when a walkway must go directly up and down a slope, particularly near the shore.
- Sweep driveways or sidewalks instead of washing them down with a hose, to prevent sediment, salt and petroleum products from washing into the lake.
- Use paving stones or treated wood instead of solid concrete for walkways; this allows water to seep through instead of running off.



Helpful Definitions

■ Accessory Structure

A detached, subordinate structure which is clearly incidental to and customarily found in connection with the principal structure to which it is related and which is located on the same lot as the principal structure.

■ Erosion and Stormwater Runoff Control Measures

Best management practices, maintenance or operational procedures, structural devices, or technologies to prevent or reduce the negative impacts of snowmelt or ice runoff, surface runoff and drainage, and soil, sediment, or rock fragments detached from the earth's surface by wind, water, ice or gravity from depositing in areas of lower elevation and/or waters of Bayfield County.

■ Expansion

Any structural modification which increases the existing structure's size and shape.

■ Exterior Improvement

Upgrades in aesthetics, function, or worth of the outside surface(s) or components of a structure. Such improvements may include, but are not limited to, structural alteration for the expansion or addition of doors or windows, or the replacement of basement/foundation walls and footings. Complete siding or a complete change in siding materials will require a land use permit.

■ Floodplains

The area adjoining a watercourse which has been and hereafter may be covered by the regional flood.

■ Footprint

That portion of a lot covered by a building or structure at the surface level, measured on a horizontal plane.

■ Impervious Surface

A surface consisting of asphalt, concrete, roofing material, brick, paving block, plastic, or other similar material which does not readily absorb water.

■ Internal Improvement

Upgrades in aesthetics, function, or worth of the interior surface(s) or components of a structure. Such improvements may include, but are not limited to, replacement or the addition of interior doors, cabinets, drywall, insulation, or plumbing, heating, and electrical system components.

■ Mitigation

Compensatory action(s) to restore natural functions and values lost through development and human alterations.

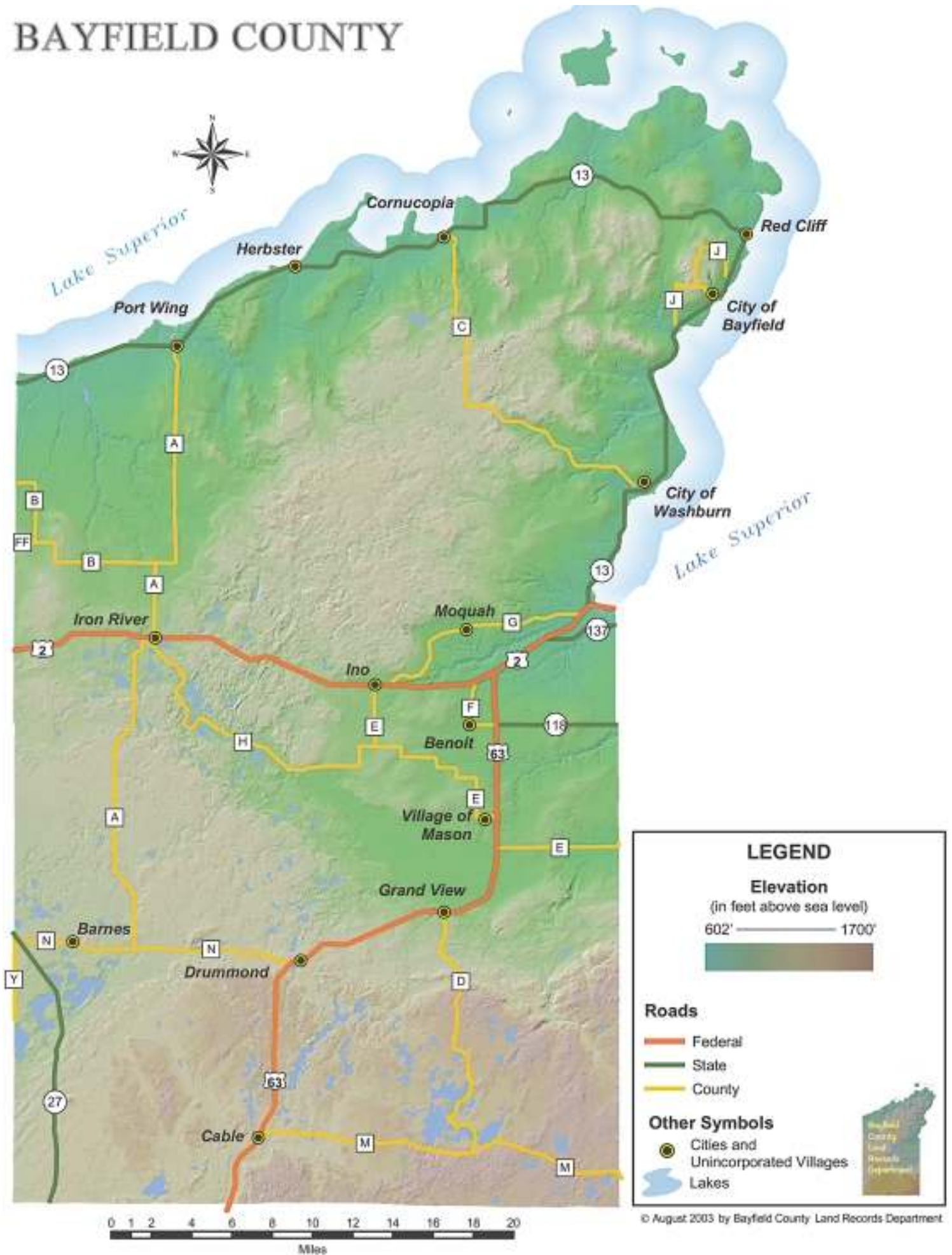
■ Structural Alteration

Any activity not considered ordinary maintenance and repair that results in a change to the internal framework, or the exterior silhouette or footprint of a structure.

■ Wetlands

Those areas where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which have soils indicative of set conditions.

BAYFIELD COUNTY





A PROPERTY OWNER'S GUIDE FOR PROTECTING & MANAGING SHORELANDS IN **BAYFIELD COUNTY**

Helpful Checklist

- Initial contact with Zoning Office to discuss plans, site location, etc.
- Gather and access information on the lake and property you are interested in.
- Review shoreland regulations to determine how these effect your lake and property.
- Obtain soil tests from Certified Soil Tester.
- Obtain necessary permits from the Zoning Office and the local town, village, city, state or federal agencies, if required.
- Because the greatest impact to water quality occurs during home construction, discuss the best management practices (BMP s) with your contractor prior to the construction phase.

Compliments of

BAYFIELD COUNTY ZONING ADMINISTRATION
POST OFFICE BOX 58
WASHBURN, WISCONSIN 54891-0058

Appendix D

Potential Ordinances

Appendix D-1

Stormwater Management

CHAPTER _____
TOWN OF BARNES

STORM WATER MANAGEMENT

SECTION I. AUTHORITY.

- (1) This ordinance is adopted by the Town Board under the authority granted by s. 60.627, Wis. Stats. This ordinance supersedes all conflicting and contradicting storm water management regulations previously enacted that relate to storm water management regulations. Except as otherwise specified in ss. 60.627 and 60.622, Wis. Stats., applies to this ordinance and to any amendments to this ordinance.
- (2) The provisions of this ordinance are deemed not to limit any other lawful regulatory powers of the Township.
- (3) The Town Board hereby designates the Town Chair, with assistance from Town Engineer to administer and enforce the provisions of this ordinance.
- (4) The requirements of this ordinance do not pre-empt more stringent storm water management requirements that may be imposed by any of the following:
 - (a) Wisconsin Department of Natural Resources administrative rules, permits or approvals including those authorized under ss. 281.16 and 283.33, Wis. Stats.
 - (b) Targeted non-agricultural performance standards promulgated in rules by the Wisconsin Department of Natural Resources under NR 151.004, Wis. Adm. Code.
 - (c) Other Township ordinances and zoning regulations.

SECTION II. FINDINGS OF FACT.

The Town Board finds that uncontrolled, post-construction runoff has a significant impact upon water resources and the health, safety and general welfare of the community and diminishes the public enjoyment and use of natural resources. Specifically, uncontrolled post-construction runoff can:

- (1) Degrade physical stream habitat by increasing stream bank erosion, increasing streambed scour, diminishing groundwater recharge, diminishing stream base flows and increasing stream temperature.

- (2) Diminish the capacity of lakes and streams to support fish, aquatic life, recreational and water supply uses by increasing pollutant loading of sediment, suspended solids, nutrients, heavy metals, bacteria, pathogens and other urban pollutants.
- (3) Alter wetland communities by changing wetland hydrology and by increasing pollutant loads.
- (4) Reduce the quality of groundwater by increasing pollutant loading.
- (5) Threaten public health, safety, property and general welfare by overtaxing storm sewers, drainage ways, and other minor drainage facilities.
- (6) Threaten public health, safety, property and general welfare by increasing major flood peaks and volumes.
- (7) Undermine floodplain management efforts by increasing the incidence and levels of flooding.

SECTION III. PURPOSE AND INTENT.

- (1) **PURPOSE.** The general purpose of this ordinance is to establish long-term, post-construction runoff management requirements that will diminish the threats to public health, safety, welfare and the aquatic environment. Specific purposes are to:
 - (a) Further the maintenance of safe and healthful conditions.
 - (b) Prevent and control the adverse effects of storm water; prevent and control soil erosion; prevent and control water pollution; protect spawning grounds, fish and aquatic life; control building sites, placement of structures and land uses; preserve ground cover and scenic beauty; and promote sound economic growth.
 - (c) Control exceedance of the safe capacity of existing drainage facilities and receiving water bodies; prevent undue channel erosion; control increases in the scouring and transportation of particulate matter; and prevent conditions that endanger downstream property.
- (2) **INTENT.** It is the intent of the Town Board that this ordinance regulates post-construction storm water discharges within the Township and to waters of the state. This ordinance may be applied on a site-by-site basis. The Town Board recognizes, however, that the preferred method of achieving the storm water performance standards set forth in this ordinance is through the preparation and implementation of comprehensive, systems-level storm water management plans that cover hydrologic units,

such as watersheds, on a municipal and regional scale. Such plans may prescribe regional storm water devices, practices or systems, any of which may be designed to treat runoff from more than one site prior to discharge to waters of the state. Where such plans are in conformance with the performance standards developed under s. 281.16, Wis. Stats., for regional storm water management measures and have been approved by the Town Board, it is the intent of this ordinance that the approved plan be used to identify post-construction management measures acceptable for the community.

SECTION IV. APPLICABILITY AND JURISDICTION.

(1) APPLICABILITY.

- (a) Where not otherwise limited by law, this ordinance applies after final stabilization to a site of land development or land disturbing activity of any size, which changes the pre-development hydrology and/or increases the rate of volume of runoff, or the thermal, chemical, or sediment loading leaving the site beyond the conditions that existed prior to any planned land development or land disturbing activity.
- (b) A site that meets any of the criteria in this paragraph is exempt from the requirements of this ordinance.
 - 1. Routine maintenance for project sites under 1 acres of land disturbance if performed to maintain the original line and grade, hydraulic capacity or original purpose of the facility.
 - 2. Underground utility construction such as water, sewer and fiberoptic lines. This exemption does not apply to the construction of any above ground structures associated with utility construction.
- (c) Notwithstanding the applicability requirements in paragraph (a), this ordinance applies to post-construction sites of any size that, in the opinion of the administering authority, is likely to result in runoff that exceeds the safe capacity of the existing drainage facilities or receiving body of water, that causes undue channel erosion, that increases water pollution by scouring or the transportation of particulate matter or that endangers property or public safety.
- (d) The Town Chair, with assistance of Town Engineer, may establish on-site storm water management requirements less stringent than those set forth herein, provided that provisions are made to manage storm water by an off-site facility, provided that all of the following conditions for the off-site facility are met:

1. The off-site facility is operational prior to commencing the proposed land development or land disturbing activity.
2. The off-site facility is designed and adequately sized to provide a level of storm water control equal to or greater than that which would be afforded by on-site practices meeting the requirements of this ordinance.
3. The off-site facility has a legally obligated entity responsible for its long-term operation and maintenance.

(2) **JURISDICTION.**

This ordinance applies to any land development activity or land disturbing activity within the boundaries of the Town of Barnes. No land owner or land operator may undertake a land development or land disturbing activity subject to this ordinance without having met the performance standards set forth in this ordinance and without having received a permit from the Town Chair with assistance from the Town Engineer prior to commencing the proposed activity.

(3) **EXCLUSIONS.**

This ordinance is not applicable to:

- (a) Activities conducted by a state agency, as defined under s. 227.01 (1), Wis. Stats., but also including the office of district attorney, which is subject to the state plan promulgated or a memorandum of understanding entered into under s. 281.33 (2), Wis. Stats.
- (b) Any lot existing as of the effective date of this chapter that is currently platted and zoned single family residential or two family residential, provided, however, that the use after the land disturbing activity or land development activity shall be that of a single family residence or two family residence.
- (c) Any lot containing, as of the effective date of this chapter, a single family residence or two family residence, regardless of zoning classification, provided, however, that the use after the land disturbing activity or land development activity shall continue to be that of a single family residence or two family residence.

SECTION V. DEFINITIONS.

- (1) “Administering Authority” means a governmental employee, empowered under s. 60.627, Wis. Stats., that is designated by the Town Board to administer this ordinance.

- (2) “Agricultural Facility and Agricultural Practice” have the meaning given in s. 281.16 (1), Wis. Stats.
- (3) “Average Annual Rainfall” means a calendar year of precipitation, excluding snow, which is considered typical.
- (4) “Best Management Practices” or “BMPs” means practices, techniques, or measures that are effective in reducing flooding, removing pollutants, providing thermal mitigation, enhancing infiltration, and/or providing other benefits related to storm water management.
- (5) “Business Day” means a day the office of the Town of Barnes are routinely and customarily open for business.
- (6) “Cease and Desist Order” means a court-issued order to halt land disturbing construction activity that is being conducted without the required permit.
- (7) “Township” means the Town of Barnes and its representatives.
- (8) “Town Chair” means the governmental employee designated by the Town Board to administer this chapter, and includes assistance from the Town Engineer, and any other governmental employees designated by the Town Chair or the Town Board in the absence of the Town Chair.
- (9) “Combined Sewer System” means a system for conveying both sanitary sewage and storm water runoff.
- (10) “Connected Imperviousness” means an impervious surface that is directly connected to a separate storm sewer or water of the state via an impervious flow path.
- (11) “Design Storm” means a hypothetical discrete rainstorm characterized by a specific duration, temporal distribution, rainfall intensity, return frequency, and total depth of rainfall.
- (12) “Detention” means the temporary detaining or storage of storm water in reservoirs, on rooftops, in streets, parking lots, or other areas under predetermined and controlled conditions, with the rate of discharge therefore regulated by appropriately installed devices.
- (13) “Development” means residential, commercial, industrial or institutional land uses and associated roads.
- (14) “Effective Infiltration Area” means the area of the infiltration system that is used to infiltrate runoff and does not include the area used for site access, berms or pretreatment.

- (15) “Erosion” or “Soil Erosion” means the detachment process and movement of soil and rock fragments by which the land's surface is worn away by the action of wind, water, ice or gravity.
- (16) “Excavation” means any act by which organic matter, earth, sand, gravel, rock, or any other similar material is cut into, dug, quarried, uncovered, removed, displaced, relocated or bulldozed, and shall include the conditions resulting from the activity.
- (17) “Exceptional Resource Waters” means waters listed in NR 102.11, Wis. Adm. Code.
- (18) “Fill” means any act, by which earth, sand, gravel, rock, or any other material is deposited, placed, replaced, pushed, dumped, pulled, transported or moved by man to a new location and shall include the conditions resulting therefrom.
- (19) “Final Stabilization” means that all land disturbing construction activities at the construction site have been completed and that a dense uniform, perennial, vegetative cover has been established, for the unpaved areas and areas not covered by permanent structures, or employment of equivalent permanent stabilization measures.
- (20) “Financial Guarantee” means a performance bond, maintenance bond, surety bond, irrevocable letter of credit, or similar guarantees submitted to the Town of Barnes by the responsible party to assure that requirements of the ordinance are carried out in compliance with the storm water management plan.
- (21) “Governing Body” means the Town Board of the Town of Barnes.
- (22) “Grading” means altering the elevation of the land surface by stripping, excavating, filling, stockpiling of soil materials or any combination thereof and shall include the land from which the material was taken or upon which it was placed.
- (23) “Impervious Surface” means an area that releases as runoff all or a large portion of the precipitation that falls on it, except for frozen soil. Rooftops, sidewalks, driveways, parking lots and streets are examples of areas that typically are impervious.
- (24) “In-Fill Area” means an undeveloped area of land located within existing development.
- (25) “Infiltration” means the process by which rainfall or surface runoff percolates or penetrates into the underlying soil.
- (26) “Infiltration System” means a device or practice such as a basin, trench, rain garden or swale designed specifically to encourage infiltration, but does not include natural infiltration in pervious surfaces such as lawns, redirecting of rooftop downspouts onto lawns or minimal infiltration from practices, such as swales or road side channels designed for conveyance and pollutant removal only.

- (27) “Karst Feature” means an area or surficial geologic feature subject to bedrock dissolution so that it is likely to provide a conduit to groundwater, and may include caves, enlarged fractures, mine features, exposed bedrock surfaces, sinkholes, springs, seeps or swallets.
- (28) “Land Development Activity” means any construction of buildings, roads, parking lots, paved and unpaved storage areas and similar facilities, including agricultural facilities.
- (29) “Land Disturbing Activity” means any man-made alteration of the land surface of public or private lands resulting in a change in the topography or existing vegetative or non-vegetative soil cover, that may result in runoff and lead to an increase in soil erosion and movement of sediment within the Township and into waters of the state. Land disturbing activity includes, but is not limited to, clearing and grubbing, tilling, removal of vegetative cover, stockpiling of soil, demolition, excavating, pit trench dewatering, filling and grading activities, except that the term shall not include such minor land disturbing activities as home gardens and normal repair and maintenance of private roads. This term does not include agricultural practices.
- (30) “Land Occupier” means any person who holds title to land either as sole owner, a tenant in common or a joint tenant or has title as a trustee, assignee, or has a land contract vendor’s or vendee’s interest.
- (31) “Land Cover” means the various cover types found on a specific parcel including impervious surface, green space, wooded area, parking lot, etc.
- (32) “Lot” means a parcel of land having a width and depth sufficient to provide the space necessary for one main building and its accessory buildings, together with the open spaces required under Town of Barnes Town Ordinance and abutting on a public street or officially approved place.
- (33) “Maintenance and Monitoring Agreement” means a legal document that is filed with the County Register of Deeds as a property deed restriction, and which provides for long-term maintenance of storm water management practices.
- (34) “Natural Resources Conservation Service” or “NRCS” means the United States Agency responsible for establishing standards for and design of many water quality structures and practices. The NRCS was formerly the Soil Conservation Service or SCS.
- (35) “MEP” or “Maximum Extent Practicable” means a level of implementing best management practices in order to achieve a performance standard specified in this ordinance which takes into account the best available technology, cost effectiveness and other competing issues such as human safety and welfare, endangered and threatened resources, historic properties and geographic features. MEP allows flexibility in the way to meet the performance standards and may vary based on the performance standard and site conditions.

- (36) “New Development” means development resulting from the conversion of previously undeveloped land or agricultural land uses.
- (37) “Off-Site” means located outside the property boundary described in the permit application for land development activity or land disturbing activity.
- (38) “On-Site” means located within the property boundary described in the permit application for land development activity or land disturbing activity.
- (39) “Ordinary High-Water Mark” has the meaning given in NR 115.03(6), Wis. Adm. Code.
- (40) “Outstanding Resource Waters” means waters listed in NR 102.10, Wis. Adm. Code.
- (41) “P8 - Urban Catchment Model” means a program for predicting polluting particle passage thru pits, puddles, and ponds; prepared for IEP, Inc. & Narragansett Bay Project USEPA/RIDEM by William W. Walker, Jr.
- (42) “Parcel” means all contiguous lands under the ownership or control of a landowner, land occupier, or land user.
- (43) “Peak Runoff Rate” means the maximum rate at which storm water is discharged from a site as expressed in cubic feet per second.
- (44) “Percent Fines” means the percentage of a given sample of soil, which passes through a #200 sieve.
- (45) “Performance Standard” means a narrative or measurable number specifying the minimum acceptable outcome for a facility or practice.
- (46) “Permit” means a written authorization made by the administering authority to an applicant to conduct land development or land disturbing activities or to discharge post-construction runoff within the Township and to waters of the state.
- (47) “Permit Administration Fee” means a sum of money paid to the administering authority by the permit applicant for the purpose of recouping the expenses incurred by the authority in administering the permit.
- (48) “Permittee” means any person to whom a permit is issued.
- (49) “Person” means any individual, corporation, partnership, joint venture, agency, unincorporated association, municipal corporation, county or state agency within Wisconsin, the Federal government or any combination thereof.

- (50) “Pervious Surface” means an area that releases as runoff a small portion of the precipitation that falls on it. Lawns, gardens, parks, forests or other similar vegetated areas are examples of surfaces that typically are pervious.
- (51) “Plan Commission” means the body established under s. 62.23(1), Wis. Stats.
- (52) “Pollutant” has the meaning given in s. 283.01(13), Wis. Stats.
- (53) “Pollution” has the meaning given in s. 281.01(10), Wis. Stats.
- (54) “Post-Construction Site” means a construction site following the completion of land development or land disturbing activities and final site stabilization.
- (55) “Pre-Development Condition” means the extent and distribution of land cover types present before the initiation of land development activity or land disturbing activity, provided that the current storm water drainage system is sufficient to satisfy the requirements of this ordinance. If the current storm water drainage system is insufficient to satisfy the requirements of this ordinance with respect to current existing land cover, “pre-development condition” shall mean that extent and distribution of land cover types for which the current storm water drainage system would be sufficient to satisfy the requirements of this ordinance.
- (56) “Preventive Action Limit” has the meaning given in NR 140.05(17), Wis. Adm. Code.
- (57) “Public Lands” means all publicly owned lands which are subject to regulation by the Township including, but not limited to:
- (a) All lands owned by the Township.
 - (b) All lands which are owned by another unit of government if that unit of government or the development project is legally subject to erosion and storm water runoff control by the Township under this chapter or by reference under other ordinances.
- (58) “Redevelopment “ means areas where development is replacing older development.
- (59) “Regional Pond” means a storm water pond intended to serve multiple parcels and/or developments, thus eliminating the need for individual on-site facilities.
- (60) “Removal” means cutting vegetation to the ground or stumps, complete extraction or killing by spraying.

- (61) “Responsible Party” means any entity holding fee title to the property or other person contracted or obligated by other agreement to implement and maintain post-construction storm water BMPs.
- (62) “Retention” means the permanent storage of storm water without discharge.
- (63) “Runoff” means the same as definition for “Storm Water Runoff”.
- (64) “Safe Capacity” means the rate of flow that can be handled by the receiving waterway without causing flooding or erosion damage.
- (65) “Sediment” means solid material, both mineral and organic, that has been deposited by water, is in suspension in water, is being transported or has been removed from its site of origin by the processes of soil erosion or is discharged into surface waters from other sources.
- (66) “Sedimentation” means settling or deposition of sediment.
- (67) “Sensitive Resources” means natural resources that are sensitive to the impacts of urbanization, specifically including ground water, cold-water springs, wetlands with diverse functions and values and other unique resources.
- (68) “Separate Storm Sewer” means a conveyance or system of conveyances including roads with drainage systems, streets, catch basins, curbs, gutters, ditches, constructed channels or storm drains, which meets all of the following criteria:
- (a) Is designed or used for collecting water or conveying runoff.
 - (b) Is not part of a combined sewer system.
 - (c) Is not draining to a storm water treatment device or system.
 - (d) Discharges directly or indirectly to waters of the state.
- (69) “Site” means the entire area included in the legal description of the land on which the land development or land disturbing activity occurred.
- (70) “Site Restriction” means any physical characteristic which limits the use of storm water best management practice as prescribed in the Wisconsin Storm Water Manual published by the Wisconsin Department of Natural Resources.

- (71) “Stop Work Order” means a method of giving notice to the permittee that one or more provisions of this chapter have been violated. Notice is given both by posting upon the lands where the disturbing activity occurs one or more copies of a poster stating the violation and by mailing a copy of this poster by certified mail to the permittee at the address shown on the permit.
- (72) “Storm Sewer” means a closed conduit for conducting collected storm water.
- (73) “Storm Water Drainage System” or “Drainage System” means all facilities used for conducting runoff to, through or from a drainage area to the point of final outlet including, but not limited to, any of the following: conduits and appurtenant features, canals, channels, ditches, streams, culverts, reservoirs, detention basins, storm sewers, streets and pumping stations.
- (74) “Storm Water Management Plan” means a document that identifies what actions will be taken to reduce storm water quantity, volume, pollutant loads, thermal increases to the receiving stream and/or erosion resulting from land development activity to levels meeting the purpose and intent of this ordinance and the Barnes / Kawaguesaga Lakes Lake Management Master Plan.
- (75) “Barnes / Kawaguesaga Lakes Lake Management Master Plan” is a comprehensive plan designed to reduce the discharge of runoff and pollutants from hydrologic units on a regional or municipal scale.
- (76) “Storm Water Runoff” means that portion of the precipitation falling during a rainfall event, or that portion of snowmelt, that runs off the surface of the land and into the natural or artificial conveyance or drainage network.
- (77) “Technical Standard” means a document that specifies design, predicted performance and operation and maintenance specifications for a material, device or method.
- (78) “Top of the Channel” means an edge, or point on the landscape, landward from the ordinary high- water mark of a surface water of the state, where the slope of the land begins to be less than 12% continually for at least 50 feet. If the slope of the land is 12% or less continually for the initial 50 feet, landward from the ordinary high-water mark, the top of the channel is the ordinary high-water mark.
- (79) “TR-55” means the United States Department of Agriculture, Natural Resources Conservation Service (previously Soil Conservation Service), Urban Hydrology for Small Watersheds, Second Edition, Technical Release 55, June 1986.

- (80) "Type II Distribution" means a rainfall type curve as established in the "United States Department of Agriculture, Soil Conservation Service, Technical Paper 149, published 1973". The Type II curve is applicable to all of Wisconsin and represents the most intense storm pattern.
- (81) "Waters of the State" has the meaning given in s. 281.01 (18), Wis. Stats.
- (82) "Wetlands" means an area where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions. These wetlands include natural, mitigation, and restored wetlands.
- (83) "WPDES Storm Water Permit" means a permit issued by the Wisconsin Department of Natural Resources under s. 283.31 Wis. Stats. that authorizes the point source discharge of storm water to waters of the state.

SECTION VI. TECHNICAL STANDARDS.

- (1) **DESIGN CRITERIA, STANDARDS, AND SPECIFICATIONS.** All BMPs required to comply with this ordinance shall meet the design criteria, standards and specifications based on the following. If technical standards contained in the following documents conflict, the governing document shall be determined based on the order presented. Those technical standards with the highest priority shall prevail. In determining priorities, Section VI (1) (a) shall be deemed to have top priority followed by Section VI (1) (b), then Section VI (1) (c), with Section VI (1) (d) having the lowest priority.
 - (a) Applicable design criteria, standards and specifications identified in this ordinance.
 - (b) Applicable design criteria, standards and specifications identified in the Wisconsin Construction Site Best Management Practice Handbook, WDNR Pub. WT-222-2001 Revision.
 - (c) Applicable design criteria, standards and specifications identified in the Wisconsin Storm Water Manual, WDNR Pub. WR-349-94, 1994, including Technical Design Guidelines for Storm Water Management Practices, UW-Extension Pub. G3691, 2000.
 - (d) Other design guidance and technical standards identified or developed by the Wisconsin Department of Natural Resources under subchapter V or chapter NR 151, Wis. Adm. Code.

- (2) OTHER STANDARDS. Other technical standards not identified or developed in sub. (1), but equivalent thereto, may be used provided that the methods have been approved by the Town Chair with assistance from the Town Engineer.

SECTION VII. PERFORMANCE STANDARDS.

- (1) RESPONSIBLE PARTY. The responsible party shall implement a post-construction storm water management plan that incorporates the requirements of this section.
- (2) PLAN. A written storm water management plan in accordance with Section IX shall be developed and implemented for each post-construction site. Unless the Town Chair, with assistance from the Town Engineer, gives prior written authorization, the methods in conformance with the technical standards shall be followed.
- (3) REQUIREMENTS. The plan required under sub. (2) shall include the following:
 - (a) GENERAL REQUIREMENTS FOR STORM WATER MANAGEMENT MEASURES. The following shall be observed in managing storm water runoff:
 1. The applicant shall attend a pre-application meeting with the Township before any data will be accepted. The purpose of the meeting is to specifically address required approvals and permits, and applicable technical standards.
 2. Natural topography and land cover features such as natural swales, natural depressions, native soil infiltrating capacity, and natural ground water recharge areas shall be preserved and used, to the extent possible, to meet the requirements of this ordinance.
 3. Emergency overland flow for all storm water facilities shall be provided during and after construction to prevent exceeding the safe capacity of downstream drainage facilities and prevent endangerment of downstream property or public safety.
 4. All storm water rate control facilities shall be located within drainage, utility, and/or flowage easements to provide access and to prevent future alteration or encroachment.
 5. Water quality facilities are required for all developments unless a development is part of a Township-approved regional facility drainage area.

6. All hydrologic data shall be submitted to the Township. Data shall be obtained using NRCS methodology including, but not limited to, HydroCad, Haestad Methods, or TR20/TR55 as defined by the NRCS.
 7. Hydrologic analysis shall be based on NRCS methods using a Type II storm distribution, 24-hour duration, and average soil moisture conditions (AMC-2), as defined by NRCS.
 8. Hydraulic calculations will be accepted in the Rational Method format or in commonly used software packages such as Eagle Point, HydroCad, Haestad Methods, HEC-RAS, or XP-SWMM.
 9. When runoff from an upstream property passes through a downstream property, and it is desirable in the opinion of the Township to oversize a pond or conveyance system to serve increased runoff from predicted development of adjacent properties, the cost of oversizing the facility shall be determined by the Township, and assessed, in accordance with State Law and the Municipal Code.
 10. Where appropriate, the plan shall include sediment controls to do all of the following to the maximum extent practicable:
 - a. Prevent tracking of sediment from the construction site onto roads and other paved surfaces.
 - b. Prevent the discharge of sediment as part of site dewatering.
 - c. Protect the separate storm drain inlet structure from receiving sediment.
 11. The use, storage, and disposal of chemicals, cement, and other compounds and materials used on the construction site shall be managed during the construction period, to prevent their entrance into waters of the state. However, projects that require the placement of these materials in waters of the state, such as constructing bridge footings or BMP installations, are not prohibited by this paragraph.
- (b) **TOTAL SUSPENDED SOLIDS.** BMPs shall be designed, installed and maintained to control total suspended solids carried in runoff from the post-construction site as follows:
1. For new development, by design, reduce to the maximum extent practicable, the total suspended solids load by 80%, based on the average annual rainfall, as compared to no runoff management controls.

2. For redevelopment, by design, reduce to the maximum extent practicable, the total suspended solids load by 40%, based on the average annual rainfall, as compared to no runoff management controls. A 40% total suspended solids reduction shall meet the requirements of this ordinance.
 3. All water quality analyses shall be based on the P8 Urban Catchment Model or other comparable model as approved by the Town Chair with assistance from the Town Engineer.
 4. For this ordinance, the following year has been selected as average annual rainfall: Minneapolis, 1959, (Oct. 1, 1958 - Sept. 30, 1959).
 5. Notwithstanding subs. 1. to 4., if the design cannot achieve the applicable total suspended solids reduction specified, the storm water management plan shall include a written and site-specific explanation why that level of reduction is not attained and the total suspended solids load shall be reduced to the maximum extent practicable.
- (c) **PEAK DISCHARGE RATE AND VOLUME.** By design, BMPs shall be employed to meet the following performance standards.
1. For a 1.5 inch rainfall event the proposed post-development runoff volume and peak flow rate must not exceed the runoff volume and peak flow rate for pre-development conditions.
 2. For the 2-year, 10-year, and 100-year rainfall event: the post-development peak flow rate shall not exceed the peak flow rate for pre-development land use conditions, or less if downstream system capacity problems exist.
 3. Pre-development conditions shall assume “good hydrologic conditions” for appropriate land covers as identified in TR-55 or an equivalent methodology. The meanings of “hydrologic soil group” and “runoff curve number” are as determined in TR-55. However, when pre-development land cover is cropland, rather than using TR-55 values for cropland, the runoff curve numbers in Table 1 shall be used.

Table 1 - Maximum Pre-Development Runoff Curve Numbers for Cropland Areas				
Hydrologic Soil Group	A	B	C	D
Runoff Curve Number	56	70	79	83

- (d) **INFILTRATION PRACTICES.** BMPs shall be designed, installed, and maintained to infiltrate runoff to meet the runoff rates and volume where hydrologic Group A or B soils exist to the maximum extent practicable in accordance with the following:
1. Where infiltration practices will be used, the location, surface area, depth, soil types (hydrologic group) and infiltration rate and volume computations shall be submitted to the Town Engineer.
 2. Pre-development condition shall be the same as in par. (b).
 3. Before infiltrating runoff, pretreatment shall be required for parking lot runoff and for runoff from new road construction in commercial, industrial and institutional areas that will enter an infiltration system. The pretreatment shall be designed to protect the infiltration system from clogging prior to scheduled maintenance and to protect groundwater quality in accordance with subd. 6. Pretreatment options may include, but are not limited to, oil/grease separation, sedimentation, biofiltration, filtration, swales or filter strips.
 4. Exclusions. The runoff from the following areas are prohibited from meeting the requirements of this paragraph:
 - a. Areas associated with tier 1 industrial facilities identified in NR 216.21(2)(a), Wis. Adm. Code, including storage, loading, rooftop and parking.
 - b. Storage and loading areas of tier 2 industrial facilities identified in NR 216.21(2)(b), Wis. Adm. Code.
 - c. Fueling and vehicle maintenance areas.
 - d. Areas within 1000 feet upgradient or within 100 feet downgradient of karst features.
 - e. Areas with less than 3 feet separation distance from the bottom of the infiltration system to the elevation of seasonal high groundwater or the top of bedrock, except this subd. 4.e. does not prohibit infiltration of roof runoff.

- f. Areas with runoff from industrial, commercial and institutional parking lots and roads and residential arterial roads with less than 5 feet separation distance from the bottom of the infiltration system to the elevation of seasonal high groundwater or the top of bedrock.
 - g. Areas within 400 feet of a community water system well as specified in NR 811.16(4), Wis. Adm. Code, or within 100 feet of a private well as specified in NR 812.08(4), Wis. Adm. Code, for runoff infiltrated from commercial, industrial and institutional land uses or regional devices for residential development.
 - h. Areas where contaminants of concern, as defined in NR 720.03(2), Wis. Adm. Code are present in the soil through which infiltration will occur.
 - i. Any area where the soil does not exhibit one of the following soil characteristics between the bottom of the infiltration system and the seasonal high groundwater and top of bedrock: at least a 3-foot soil layer with 20% fines or greater; or at least a 5-foot soil layer with 10 percent fines or greater. This does not apply where the soil medium within the infiltration system provides an equivalent level of protection. This subd. 4.i. does not prohibit infiltration of roof runoff.
- 5. Where alternate uses of runoff are employed, such as for toilet flushing, laundry or irrigation, such alternate use shall be given equal credit toward the infiltration volume required by this paragraph.
 - 6. Infiltration systems designed in accordance with this paragraph shall, to the extent technically and economically feasible, minimize the level of pollutants infiltrating to groundwater and shall maintain compliance with the preventive action limit at a point of standards application in accordance with NR 140, Wis. Adm. Code. However, if site specific information indicates that compliance with a preventive action limit is not achievable, the infiltration BMP may not be installed or shall be modified to prevent infiltration to the maximum extent practicable.
 - 7. Notwithstanding paragraph (d) 6., the discharge from BMPs shall remain below the enforcement standard at the point of standards application.

(e) PROTECTIVE AREAS.

1. “Protective area” means an area of land that commences at the top of the channel of lakes, streams and rivers, or at the delineated boundary of wetlands, and that is the greatest of the following widths, as measured horizontally from the top of the channel or delineated wetland boundary to the closest impervious surface. However, in this paragraph, “protective area” does not include any area of land adjacent to any stream enclosed within a pipe or culvert, such that runoff cannot enter the enclosure at this location.
 - a. For outstanding resource waters and exceptional resource waters, and for wetlands in areas of special natural resource interest as specified in NR 103.04, 75 feet.
 - b. For perennial and intermittent streams identified on a United States geological survey 7.5-minute series topographic map, or a county soil survey map, whichever is more current, 50 feet.
 - c. For lakes, 50 feet.
 - d. For highly susceptible wetlands, 50 feet. Highly susceptible wetlands include the following types: fens, sedge meadows, bogs, low prairies, conifer swamps, shrub swamps, other forested wetlands, fresh wet meadows, shallow marshes, deep marshes and seasonally flooded basins. Wetland boundary delineations shall be made in accordance with NR 103.08(1m). This paragraph does not apply to wetlands that have been completely filled in accordance with all applicable state and federal regulations. The protective area for wetlands that have been partially filled in accordance with all applicable state and federal regulations shall be measured from the wetland boundary delineation after fill has been placed.
 - e. For less susceptible wetlands, 10 percent of the average wetland width, but no less than 10 feet nor more than 30 feet. Less susceptible wetlands include degraded wetlands dominated by invasive species such as reed canary grass.
 - f. In subd. 1.a., d. and e., determinations of the extent of the protective area adjacent to wetlands shall be made on the basis of the sensitivity and runoff susceptibility of the wetland in accordance with the standards and criteria in NR 103.03.

- g. For concentrated flow channels with drainage areas greater than 130 acres, 10 feet.
- 2. This paragraph applies to post-construction sites located within a protective area, except those areas exempted pursuant to subd. 4.
 - 3. The following requirements shall be met:
 - a. Impervious surfaces shall be kept out of the protective area to the maximum extent practicable. The storm water management plan shall contain a written site-specific explanation for any parts of the protective area that are disturbed during construction.
 - b. Where land disturbing construction activity occurs within a protective area, and where no impervious surface is present, adequate sod or self-sustaining vegetative cover shall be established and maintained. The adequate sod or self-sustaining vegetative cover shall be sufficient to provide for bank stability, maintenance of fish habitat and filtering of pollutants from upslope overland flow areas under sheet flow conditions. Non-vegetative materials, such as rock riprap, may be employed on the bank as necessary to prevent erosion, such as on steep slopes or where high velocity flows occur.
 - c. Best management practices such as filter strips, swales, or wet detention basins, that are designed to control pollutants from non-point sources may be located in the protective area.
 - 4. This paragraph does not apply to:
 - a. Structures that cross or access surface waters such as boat landings, bridges and culverts.
 - b. Structures constructed in accordance with s. 59.692(1v), Wis. Stats.
 - c. Post-construction sites from which runoff does not enter the surface water, except to the extent that vegetative ground cover is necessary to maintain bank stability.

- (f) FUELING AND VEHICLE MAINTENANCE AREAS. Fueling and vehicle maintenance areas shall, to the maximum extent practicable, have BMPs designed, installed and maintained to reduce petroleum within runoff, such that the runoff that enters waters of the Township and State and contains no visible petroleum sheen.
- (4) GENERAL CONSIDERATIONS FOR ON-SITE AND OFF-SITE STORM WATER MANAGEMENT MEASURES. The following considerations shall be observed in managing runoff:
- (a) Natural topography and land cover features such as natural swales, natural depressions, native soil infiltrating capacity, and natural groundwater recharge areas shall be preserved and used, to the extent possible, to meet the requirements of this section.
 - (b) Emergency overland flow for all storm water facilities shall be provided to prevent exceeding the safe capacity of downstream drainage facilities and prevent endangerment of downstream property or public safety.
- (5) LOCATION AND REGIONAL TREATMENT OPTION.
- (a) The BMPs may be located on-site or off-site as part of a regional storm water device, practice or system.
 - (b) Post-construction runoff within a non-navigable surface water that flows into a BMP, such as a wet detention pond, is not required to meet the performance standards of this ordinance. Post-construction BMPs may be located in non-navigable surface waters.
 - (c) Except as allowed under par. (d), post-construction runoff from new development shall meet the post-construction performance standards prior to entering a navigable surface water.
 - (d) Post-construction runoff from any development within a navigable surface water that flows into a BMP is not required to meet the performance standards of this ordinance if:
 1. The BMP was constructed prior to the effective date of this ordinance and the BMP either received a permit issued under ch. 30, Stats., or the BMP did not require a ch. 30, Wis. Stats., permit; and
 2. The BMP is designed to provide runoff treatment from future upland development.

- (e) Runoff from existing development, redevelopment and in-fill areas shall meet the post-construction performance standards in accordance with this paragraph.
 - 1. To the maximum extent practicable, BMPs shall be located to treat runoff prior to discharge to navigable surface waters.
 - 2. Post-construction BMPs for such runoff may be located in a navigable surface water if allowable under all other applicable federal, state and local regulations such as NR 103, Wis. Adm. Code and ch. 30, Wis. Stats.
- (f) The discharge of runoff from a BMP, such as a wet detention pond, or after a series of such BMPs is subject to this chapter.
- (g) The administering authority may approve off-site management measures provided that all of the following conditions are met:
 - 1. The administering authority determines that the post-construction runoff is covered by a storm water management system plan that is approved by the Town of Barnes and that contains management requirements consistent with the purpose and intent of this ordinance.
 - 2. The off-site facility meets all of the following conditions:
 - a. The facility is in place.
 - b. The facility is designed and adequately sized to provide a level of storm water control equal to or greater than that which would be afforded by on-site practices meeting the performance standards of this ordinance.
 - c. The facility has a legally obligated entity responsible for its long-term operation and maintenance.
- (h) Where a regional treatment option exists such that the administering authority exempts the applicant from all or part of the minimum on-site storm water management requirements, the applicant shall be required to pay a fee in an amount determined in negotiation with the administering authority. In determining the fee for post-construction runoff, the administering authority shall consider an equitable distribution of the cost for land, engineering design, construction, and maintenance of the regional treatment option.

SECTION VIII. PERMITTING REQUIREMENTS, PROCEDURES AND FEES.

- (1) **PERMIT REQUIRED.** No responsible party may undertake a land development or land disturbing activity without receiving a post-construction runoff permit from the administering authority prior to commencing the proposed activity.
- (2) **PERMIT APPLICATION AND FEES.** Unless specifically excluded by this ordinance, any responsible party, land owner, or operator required to obtain a permit under this ordinance desiring a permit shall submit to the administering authority a permit application made on a form provided by the administering authority for that purpose.
 - (a) Unless otherwise excepted by this ordinance, a permit application must be accompanied by a storm water management plan, a maintenance and monitoring agreement and a non-refundable permit administration fee.
 - (b) The storm water management plan shall be prepared to meet the requirements of Section VII. and IX., the maintenance and monitoring agreement shall be prepared to meet the requirements of Section X., the financial guarantee shall meet the requirements of Section XI., and fees shall be those established by the Town Board as set forth in Section XII.
- (3) **REVIEW AND APPROVAL OF PERMIT APPLICATION.** The administering authority shall review any permit application that is submitted with a storm water management plan, maintenance and monitoring agreement, and the required fee. The following approval procedure shall be used:
 - (a) Accept all pre-application requests, and all permit applications that are accompanied by the storm water plan and the required fee.
 - (b) Within 30 business days of the receipt of a complete permit application, including all items as required by sub. (2), the administering authority shall inform the applicant whether the application, plan and maintenance agreement are approved or disapproved based on the requirements of this ordinance. The administering authority shall base the decision on requirements set forth in this ordinance, including technical standards set forth herein.
 - (c) If the storm water permit application, plan, and maintenance and monitoring agreement are approved, or if an agreed upon payment of fees in lieu of storm water management practices is made, the administering authority shall issue the permits required in accordance with the procedure as set out in this chapter, but only when sedimentation and runoff will be controlled to meet the performance standards set forth herein.

- (d) If the storm water permit application, plan or maintenance agreement is disapproved, the administering authority shall detail in writing the reasons for disapproval.
 - (e) The administering authority may request additional information from the applicant by notifying the permit applicant in writing if additional information is required for review of the storm water plan. If additional information is submitted, the administering authority shall have 15 business days from the date the additional information is received to inform the applicant that the plan and maintenance and monitoring agreement are either approved or disapproved.
 - (f) Failure by the administering authority to inform the permit applicant of a decision within 30 business days of a required submittal shall be deemed to mean approval of the submittal and the applicant may proceed as if a permit had been issued. If the applicant proceeds under this approval process, the applicant shall comply with the permit requirements in Section VIII (4), (5), and (6).
 - (g) The administering authority shall keep an accurate record of all plan data accepted, plans approved, permits issued, inspections made, and other official records.
- (4) **PERMIT REQUIREMENTS.** All permits issued under this ordinance shall be subject to the following conditions, and holders of permits issued under this ordinance, and permit applicants proceeding as if a permit had been issued under the approval process provided in this ordinance, shall be deemed to have accepted these conditions. The administering authority may suspend or revoke a permit for violation of a permit condition, following written notification of the responsible party. An action by the administering authority to suspend or revoke this permit may be appealed in accordance with Section XIV.
- (a) Compliance with this permit does not relieve the responsible party of the responsibility to comply with other applicable federal, state, and local laws and regulations.
 - (b) The responsible party shall design and install all structural and non-structural storm water management measures in accordance with the approved storm water management plan, the technical standards set forth in Section VI, and the performance standards set forth in Section VII, and this permit, prior to commencing any land development or land disturbing activity.
 - (c) The responsible party shall notify the administering authority at least 5 business days before commencing any work in conjunction with the storm water management plan, and within 5 business days upon completion of the storm water management practices. If required as a special condition under sub. (5), the

responsible party shall make additional notification according to a schedule set forth by the administering authority so that practice installations can be inspected during construction.

- (d) Practice and infrastructure installations required as part of this ordinance shall be certified “as built” by a licensed professional engineer other than the Town Engineer and Town Chair. Completed storm water management practices must pass a final inspection by the administering authority or its designee to determine if they are in accordance with the approved storm water management plan and ordinance. The administering authority or its designee shall notify the responsible party in writing of any changes required in such practices to bring them into compliance with the conditions of this permit. The administering authority shall notify the permit holder when storm water management practices have passed final inspection.
- (e) The responsible party shall notify the administering authority of any significant modifications it intends to make to an approved storm water management plan. The administering authority may require that the proposed modifications be submitted to it for approval prior to incorporation into the storm water management plan and execution by the responsible party.
- (f) The responsible party shall maintain all storm water management practices in accordance with the storm water management plan until the practices either become the responsibility of the Town Board, or are transferred to subsequent private owners as specified in the approved maintenance agreement.
- (g) The responsible party authorizes the administering authority to perform any work or operations necessary to bring storm water management measures into conformance with the approved storm water management plan, and consents to a special assessment or charge against the property as authorized under ss. 66.0627 or 66.0703, Wis. Stats., or to charging such costs against the financial guarantee posted under Section XI in accordance with this ordinance to cover the costs of such work or operations. The responsible party shall waive notice and hearing as provided by s. 66.0703(7), Wis. Stats.
- (h) If so directed by the administering authority, the responsible party shall repair at the responsible party's own expense all damage to adjoining municipal facilities, including but not limited to, roads, road right-of-ways, streets, runoff, and drainage facilities, and drainage ways caused by runoff, where such damage is caused by activities that are not in compliance with the approved storm water management plan until they are accepted and become the responsibility of the governmental entity.

- (i) The responsible party shall permit property access to the administering authority or its designee for the purpose of inspecting the property for compliance with the approved storm water management plan and this permit.
- (j) If an approved storm water plan involves changes in direction, changes in post-development hydrology, increases in peak rate and/or total volume of runoff, the sediment loading and/or thermal pollution from a site, the administering authority may require the responsible party to make appropriate legal arrangements with affected property owners concerning the prevention of endangerment to property or public safety.
- (k) The permittee shall provide and install at its expense all drainage, runoff control, and erosion control improvements as required by this chapter and the approved storm water plan, and also shall bear its proportionate share of the total cost of off site improvements to drainage systems based upon the existing developed drainage area or planned development of the drainage area, as determined by the administering authority.
- (l) A copy of the storm water plan shall be available at the job site when land development or land disturbing activities are in progress.
- (m) The permittee shall inspect, or cause to be inspected, the BMPs within 24 hours after each rain of 0.5 inches or more which results in runoff during active construction periods, and at least once each week, make needed repairs and document the findings of the inspections in a site erosion control log with the date of inspection, the name of the person conducting the inspection, and a description of the present phase of the construction at the site.
- (n) That permittee shall comply with the floodplain zoning standards in the Town Ordinance if the land development or land disturbing activity is in an identified flood hazard area on the Official Map.
- (o) If so directed by the administering authority, the permit holder shall repair, at the permit holder's own expense, all damage to adjoining properties, municipal facilities, and storm water drainage systems caused by storm water runoff, where such damage is caused by activities not in compliance with the approved storm water plan.
- (p) The responsible party is subject to the enforcement actions and penalties detailed in Section XIII, if the responsible party fails to comply with the terms of this permit.

- (5) PERMIT CONDITIONS. Permits issued under this subsection may include conditions established by administering authority in addition to the requirements needed to meet the performance standards in Section VII or a financial guarantee as provided for in Section XI.
- (6) PERMIT DURATION. Permits issued under this section shall be valid for 180 days from the date of issuance, except as provided as follows:
 - (a) If the administering authority has notified the permit holder that all storm water practices have passed the final inspection as required under this ordinance, then the permit expires upon notification by the Town Chair or Town Engineer.
 - (b) The administering authority may extend an existing permit if continuous progress is being made by the applicant towards completion of storm water practices.

SECTION IX. STORM WATER MANAGEMENT PLAN.

- (1) PLAN REQUIREMENTS. The storm water management plan shall contain any information the Town Chair with assistance from Town Engineer may need to evaluate the environmental characteristics of the area affected by land development or land disturbing activity, the pre- and post-development hydrology, the potential impacts of the proposed activity upon the quality (including thermal) and quantity of storm water discharges, the potential impacts upon water resources and drainage utilities, and the effectiveness and acceptability of proposed storm water management measures in meeting the technical and performance standards and other requirements of this ordinance. All site investigations, plans, designs, computations, and drawings shall be certified by a licensed professional engineer to be prepared in accordance with accepted engineering practice and requirements of this ordinance. The storm water management plan required under Section VIII (2) shall contain at a minimum the following information:
 - (a) Name, address, and telephone number for the following or their designees: landowner; developer; project engineer for practice design and certification; person(s) responsible for installation of storm water management practices; and person(s) responsible for maintenance of storm water management practices prior to the transfer, if any, of maintenance responsibility to another party.
 - (b) A proper legal description of the property proposed to be developed, referenced to the U.S. Public Land Survey system or to block and lot numbers within a recorded land subdivision plat.

(c) Pre-development site conditions, including:

1. One or more site maps at a scale of not less than 1 inch equals 100 feet. The site maps shall show the following: site location and legal property description; predominant soil types and hydrologic soil groups; existing cover type and condition; topographic contours of the site at a scale not to exceed 2 feet; topography and drainage network including enough of the contiguous properties to show runoff patterns onto, through, and from the site; watercourses that may affect or be affected by runoff from the site; flow path and direction for all storm water conveyance sections; watershed boundaries used in hydrology determinations to show compliance with performance standards; lakes, streams, wetlands, channels, ditches, and other watercourses on and immediately adjacent to the site; limits of the 100 year floodplain; location of wells and wellhead protection areas covering the project area and delineated pursuant to NR 811.16, Wis. Adm. Code.
2. Hydrology, hydraulic, and pollutant loading computer model computations as needed to show compliance with performance standards. All major assumptions used in developing input parameters shall be clearly stated. The geographic areas used in making the calculations shall be clearly cross-referenced to the required map(s).

(d) Post-development site conditions, including:

1. Explanation of the provisions to preserve and use natural topography and land cover features to minimize changes in peak flow runoff rates and volumes to surface waters and wetlands.
2. Explanation of any restrictions on storm water management measures in the development area imposed by wellhead protection plans and ordinances.
3. One or more site maps at a scale of not less than 1 inch equals 100 feet showing the following: post-construction pervious areas including vegetative cover type and condition; impervious surfaces including all buildings, structures, and pavement; post-construction topographic contours of the site at a scale not to exceed 2 feet; post-construction drainage network including enough of the contiguous properties to show runoff patterns onto, through, and from the site; locations and dimensions of drainage easements; locations of maintenance easements specified in the maintenance agreement; flow path and direction for all storm water conveyance sections; location and type of all storm water management

conveyance and treatment practices, including the on-site and off-site tributary drainage area; location and type of conveyance system that will carry runoff from the drainage and treatment practices to the nearest adequate outlet such as a curbed street, storm drain, or natural drainage way; watershed boundaries used in hydrology, hydraulic, and pollutant loading computer modeling calculations and any changes to lakes, streams, wetlands, channels, ditches, and other watercourses on and immediately adjacent to the site.

4. Hydrology, hydraulic, and pollutant loading computer model computations as needed to show compliance with performance standards. The computations shall be made for each discharge point in the development, and the geographic areas used in making the calculations shall be clearly cross-referenced to the required map(s).
 5. Results of investigations of soils and groundwater required for the placement and design of storm water management measures. Detailed drawings including cross-sections and profiles of all permanent storm water conveyance and treatment practices.
- (e) A description and installation schedule for the storm water management practices needed to meet the performance standards in Section VII.
 - (f) A maintenance plan developed for the life of each storm water management practice including the required maintenance activities and maintenance activity schedule.
 - (g) Cost estimates for the construction, operation, and maintenance of each storm water management practice.
 - (h) Other information requested in writing by the administering authority to determine compliance of the proposed storm water management measures with the provisions of this ordinance.
 - (i) All site investigations, plans, designs, computations, and drawings shall be certified by a licensed professional engineer to be prepared in accordance with accepted engineering practice and requirements of this ordinance.
- (2) **ALTERNATE REQUIREMENTS.** The administering authority may prescribe alternative submittal requirements for applicants seeking an exemption to on-site storm water management performance standards under Section VII (5).

SECTION X. MAINTENANCE AND MONITORING AGREEMENT.

- (1) **MAINTENANCE AND MONITORING AGREEMENT REQUIRED.** The maintenance and monitoring agreement required under Section IX (2) for storm water management practices shall be an agreement between the administering authority and the responsible party to provide for maintenance and monitoring for both short term and long term of storm water management practices beyond the duration period of this permit. The maintenance and monitoring agreement shall be filed with the Oneida County Register of Deeds as a property deed restriction so that it is binding upon all subsequent owners of the land served by the storm water management practices.
 - (a) The maintenance and monitoring agreement shall provide for short-term maintenance and monitoring of storm water management practices necessary to maintain temporary drainage and erosion control measures and to establish permanent drainage and erosion control measures. Short-term maintenance provisions are generally those that do not continue in perpetuity.
 - (b) The maintenance and monitoring agreement may provide for long-term maintenance and monitoring of storm water practices that continue in perpetuity. Such long-term maintenance will be required where the storm water practice serves an individual landowner or organized group of landowners.
- (2) **MONITORING REQUIREMENTS.** Storm water facilities shall be monitored in accordance with the storm water plan, the conditions of the permit and the maintenance and monitoring agreement. Monitoring shall verify whether or not the practice is functioning as designed. Monitoring may include, but may not be limited to, quality, temperature, and quantity of runoff.
- (3) **AGREEMENT PROVISIONS.** The maintenance agreement shall contain the following information and provisions and be consistent with the maintenance plan required by Section IX (1)(f):
 - (a) Identification of the storm water facilities and designation of the drainage area served by the facilities.
 - (b) A schedule for regular maintenance of each aspect of the storm water management system consistent with the storm water management plan required under Section VIII (2).
 - (c) Identification of the responsible party(s), organization or city, county, town or village responsible for long term maintenance of the storm water management practices identified in the storm water management plan required under Section VIII (2).

- (d) Requirement that the responsible party(s), organization, or city, county, town or village shall maintain storm water management practices in accordance with the schedule included in par. (b).
- (e) Authorization for the administering authority to access the property to conduct inspections and monitor the storm water management practices as necessary to ascertain that the practices are being maintained and operated in accordance with the agreement.
- (f) A requirement on the administering authority to maintain public records of the results of the site inspections, shall inform the responsible party responsible for maintenance of the inspection results, and shall specifically indicate any corrective actions required to bring the storm water management practice into proper working condition.
- (g) Agreement that the party designated under sub. (c), as responsible for long term maintenance of the storm water management practices, shall be notified by the administering authority of maintenance problems which require correction. The specified corrective actions shall be undertaken within a reasonable time frame as set by the administering authority.
- (h) Authorization of the administering authority to perform the corrected actions identified in the inspection report if the responsible party designated under sub. (c) does not make the required corrections in the specified time period. The administering authority shall enter the amount due on the tax rolls and collect the money as a special charge against the property pursuant to ss. 66.0627 or 66.0703, Wis. Stats. or it may charge the cost against the financial guarantee posed under this ordinance.

SECTION XI. FINANCIAL GUARANTEE.

- (1) **ESTABLISHMENT OF THE GUARANTEE.** The administering authority may require the submittal of a financial guarantee, the form and type of which shall be acceptable to the administering authority. The financial guarantee shall be in an amount determined by the administering authority equal to the estimated cost of construction and the estimated cost of maintenance of the storm water management practices during the period which the designated party in the maintenance and monitoring agreement has maintenance and monitoring responsibility. The financial guarantee shall give the administering authority the authorization to use the funds to complete the project storm water management practices and fulfill maintenance and monitoring requirements if the responsible party defaults or does not properly implement the approved project storm water management plan, or fails to perform required maintenance and/or monitoring responsibilities, upon written notice to the responsible party by the administering authority that the requirements of this ordinance have not been met.

- (2) **CONDITIONS FOR RELEASE.** Conditions for the release of the financial guarantee are as follows:
- (a) The administering authority may release the portion of the financial guarantee established to assure installation of storm water management practices under this section, minus any costs incurred by the administering authority to complete the project installation of practices, upon submission of “as built plans” by a licensed professional engineer. The administering authority may make provisions for a partial pro-rata release of the financial guarantee based on the completion of various development stages.
 - (b) The administering authority may release the portion of the financial guarantee established under this section to assure maintenance of storm water practices, minus any costs incurred by the administering authority, at such time that the responsibility for practice maintenance is passed on to another entity via an approved maintenance and monitoring agreement.

SECTION XII. FEE SCHEDULE.

An application for a storm water management permit under this chapter shall be accompanied by a permit administration fee in the amount of \$50.00 per acre but not less than a minimum fee of \$200.00.

SECTION XIII. COMPLIANCE ENFORCEMENT.

- (1) Any land development or land disturbing activity or post-construction runoff initiated after the effective date of this ordinance by any person, firm, association, or corporation subject to the ordinance provisions shall be deemed a violation unless conducted in accordance with said provisions.
- (2) The administering authority shall investigate and take action on all complaints made in regard to the application of this chapter. The administering authority is authorized to enter any public or private lands affected by this chapter to inspect the land prior to permit issuance for the purpose of determining whether to approve the plan and after permit issuance to determine compliance with this chapter. If permission to enter is denied prior to permit issuance the land development or land disturbing activity that is the subject of the permit shall not occur. Following permit issuance, if permission cannot be received from the land occupier or land user, entry by the administering authority shall be according to s. 66.0119, Wis. Stats.

- (3) The administering authority shall notify the responsible party by personal service or certified mail of any non-complying development or land disturbing activity or post-construction runoff. The notice shall describe the nature of the violation, remedial actions needed, a schedule for remedial action, and additional enforcement action which may be taken.
- (4) Upon receipt of written notification from the administering authority under sub. (3), the responsible party shall correct work that does not comply with the storm water management plan or other provisions of this permit. The responsible party shall make corrections as necessary to meet the specifications and schedule set forth by the administering authority in the notice. This provision also applies to land development or land disturbing activities that commenced under the approval process provided herein without obtaining a permit.
- (5) If the violations to a permit issued pursuant to this ordinance are likely to result in damage to properties, public facilities, or waters of the state, the administering authority may enter the land and take emergency actions necessary to prevent such damage. The costs incurred by the administering authority plus interest and legal costs shall be billed to the responsible party.
- (6) The administering authority is authorized to post a stop-work order upon any land development or land disturbing activity in violation of this ordinance. The administering authority shall supply a copy of each stop-work order to the Township Attorney. In lieu of the stop-work order, the administering authority may issue a written cease and desist order to any land occupier or land user whose activity is in violation of this ordinance. These orders shall specify that the activity must be ceased or brought into compliance with the ordinance within 10 calendar days. Any such stop-work order or cease and desist order shall be subject to Ch. 68, Wis. Stats.
- (7) The administering authority may revoke a permit issued under this ordinance for non-compliance with ordinance provisions. Any such revocation shall be subject to the provisions of Ch. 68, Wis. Stats. Any permit granted under this chapter may be revoked if the holder of the permit has misrepresented any material fact in the permit application or plan; or has failed to comply with the plan as originally approved or as modified in writing subsequently by the administering authority; has violated any provision of this chapter; or has violated any of the other conditions of the permit as issued to the applicant.
- (8) Any permit revocation, stop work-order, or cease and desist order shall remain in effect unless retracted by the Plan Commission, administering authority, or by a court of competent jurisdiction.

- (9) The administering authority is authorized to refer any violation of this ordinance, or of a stop-work order or cease and desist order issued pursuant to this ordinance, to the Township Attorney for the commencement of further legal proceedings in any court with jurisdiction.
- (10) Any person, firm, association, or corporation who does not comply with the provisions of this ordinance shall be subject to a forfeiture of not less than \$10 or more than \$200 per offense, based on the severity of the violation and/or the potential impact to the Township and receiving water, together with the costs of prosecution. Each day that the violation exists shall constitute a separate offense.
- (11) Every violation of this ordinance is a public nuisance. To the extent permitted by law, compliance with this ordinance may be enforced by injunction pursuant to s. 62.23(8), Wis. Stats. in so far as the same are applicable.
- (12) When the administering authority determines that the holder of a permit issued pursuant to this ordinance has failed to follow practices set forth in the technical and performance standards and storm water management plan, or has failed to comply with schedules set forth in said storm water management plan, the administering authority or a party designated by the administering authority may enter upon the land and perform the work or other operations necessary to bring the condition of said lands into conformance with requirements of the approved plan. The administering authority shall keep a detailed accounting of the costs and expenses of performing this work. These costs and expenses shall be deducted from any financial security posted pursuant to this ordinance. Where such a guarantee has not been established, or where such a guarantee is insufficient to cover these costs, the costs and expenses shall be imposed as a special assessment or charge pursuant to ss. 66.0627 or 66.0703, Wis. Stats. as set forth in this ordinance.

SECTION XIV. APPEALS.

- (1) **TOWN BOARD.** Appeals shall be made in the form of a written document to the Town Board. Upon receipt of the appeal, the Town Board shall:
 - (a) Hear and decide appeals where it is alleged that there is error in any order, requirements, decision or determination made by the administering authority in administering this chapter.
 - (b) Authorize upon appeal in specific cases such variances from the terms of this chapter as will not be contrary to the public interest, where owing to special conditions a literal enforcement of the provisions of this chapter will result in practical difficulty or unnecessary hardship, so that the spirit of this chapter shall be observed, public safety, and welfare secured and substantial justice done.

- (c) The rules, procedures, duties, and powers of the Town Board shall apply to this chapter.

SECTION XV. SEVERABILITY.

If any section, clause, provision or portion of this ordinance is judged unconstitutional or invalid by a court of competent jurisdiction, the remainder of the ordinance shall remain in force and not be affected by such judgment.

SECTION XVI. EFFECTIVE DATE.

This ordinance shall be in force and effect from and after its adoption and publication. The above and foregoing ordinance was duly adopted by the Town Board of Town of Barnes on the _____ day of _____, 2005.

Approved: _____

Attested: _____

Published: _____

Appendix D-2
Erosion Control

APPENDIX A: TOWN OF BARNES CONSTRUCTION SITE EROSION CONTROL ORDINANCE

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MODEL CONSTRUCTION SITE EROSION CONTROL ZONING ORDINANCE

AN ORDINANCE TO CREATE CHAPTER [NUMBER] OF THE ORDINANCE OF THE TOWN OF BARNES RELATING TO THE CONTROL OF CONSTRUCTION SITE EROSION RESULTING FROM LAND DISTURBING CONSTRUCTION ACTIVITIES

FOREWORD.

The intent of this ordinance is to require use of best management practices to reduce the amount of sediment and other pollutants resulting from land disturbing construction activities on sites that do not include the construction of a building and is otherwise regulated by the Wisconsin Department of Commerce in s. COMM 21.125 or COMM 50.115, Wis. Adm. Code. Use of this ordinance will foster consistent, statewide application of the construction site performance standards for new development and redevelopment contained in subchapters III and IV of ch. NR 151, Wis. Adm. Code.

The Town Chair of the Town of Barnes hereby ordains that Chapter [number] of the ordinance of the Town of Barnes created to read as follows:

[CHAPTER]
CONSTRUCTION SITE EROSION

S.01 AUTHORITY.

- (1) This ordinance is adopted under the authority granted by s. 60.627, Wis. Stats.. This ordinance supersedes all provisions of an ordinance previously enacted under s. 60.62, Wis. Stats., that relate to construction site erosion control. Except as otherwise specified in s. 60.627 Wis. Stats., s. 60.62, Wis. Stats., applies to this ordinance and to any amendments to this ordinance.
- (2) The provisions of this ordinance are deemed not to limit any other lawful regulatory powers of the same governing body.
- (3) The Town Chair hereby designates the Town Engineer to administer and enforce the provisions of this ordinance.
- (4) The requirements of this ordinance do not pre-empt more stringent erosion and sediment control requirements that may be imposed by any of the following:
 - (a) Wisconsin Department of Natural Resources administrative rules, permits or approvals including those authorized under ss. 281.16 and 283.33, Wis. Stats.
 - (b) Targeted non-agricultural performance standards promulgated in rules by the Wisconsin Department of Natural Resources under s. NR 151.004, Wis. Adm. Code.

S.02 FINDINGS OF FACT.

The Town Chair finds that runoff from land disturbing construction activity carries a significant amount of sediment and other pollutants to the waters of the state in the Town of Barnes.

S.03 PURPOSE.

It is the purpose of this ordinance to further the maintenance of safe and healthful conditions; prevent and control water pollution; prevent and control soil erosion; protect spawning grounds, fish and aquatic life; control building sites, placement of structures and land uses; preserve ground cover and scenic beauty; and promote sound economic growth, by minimizing the amount of sediment and other pollutants carried by runoff or discharged from land disturbing construction activity to waters of the state in the Town of Barnes.

S.04 APPLICABILITY AND JURISDICTION.

(1) APPLICABILITY.

- (a) This ordinance applies to the following land disturbing construction activities except as provided under sub. (b):
1. A construction site, which has 1 or more acres of land disturbing construction activity.

Note to Users: The 1-acre land disturbance thresholds are consistent with state and federal laws regarding applicability of construction site erosion control permits.

- (b) This ordinance does not apply to the following:
1. Land disturbing construction activity that includes the construction of a building and is otherwise regulated by the Wisconsin Department of Commerce under s. COMM 21.125 or COMM 50.115, Wis. Adm. Code.
 2. A construction project that is exempted by federal statutes or regulations from the requirement to have a national pollutant discharge elimination system permit issued under chapter 40, Code of Federal Regulations, part 122, for land disturbing construction activity.
 3. Nonpoint discharges from agricultural facilities and practices.
 4. Nonpoint discharges from silviculture activities.
 5. Routine maintenance for project sites under 5 acres of land disturbance if performed to maintain the original line and grade, hydraulic capacity or original purpose of the facility.
- (c) Notwithstanding the applicability requirements in paragraph (a), this ordinance applies to construction sites of any size that, in the opinion of the Town Engineer, are likely to result in runoff that exceeds the safe capacity of the existing drainage facilities or receiving body of water, that causes undue channel erosion, that increases water pollution by scouring or the transportation of particulate matter or that endangers property or public safety.

Note to Users: The municipality may want to consider separate legal authority to address situations where persons other than the responsible party destroy or render ineffective BMPs constructed to meet the performance standards of this ordinance.

(2) JURISDICTION.

This ordinance applies to land disturbing construction activity on construction sites located within the boundaries and jurisdiction of the Town of Barnes.

or

land disturbing construction activities on lands within the boundaries and jurisdiction of the Town of Barnes, as well as the extraterritorial division of land subject to an ordinance enacted pursuant to s. 236.45(2) and (3), Wis. Stats.

or

land disturbing construction activities on lands within the boundaries and jurisdiction of the Town of Barnes, as well as all lands located within the extraterritorial plat approval jurisdiction of Town of Barnes, even if plat approval is not involved.

Note to Users: These options differ in the amount of land area covered by this ordinance and may have ramifications for enforcement authority. For counties, the first option will be the only option since counties do not have extraterritorial authority. Under s. 59.693(10), Wis. Stats., if a county ordinance exists at the time of annexation, then the municipal ordinance must be at least as restrictive as the county ordinance.

(3) EXCLUSIONS.

This ordinance is not applicable to activities conducted by a state agency, as defined under s. 227.01 (1), Wis. Stats., but also including the office of district attorney, which is subject to the state plan promulgated or a memorandum of understanding entered into under s. 281.33 (2), Wis. Stats.

Note to Users: The Wisconsin Department of Transportation (WisDOT) has entered into a memorandum of understanding with the Wisconsin Department of Natural Resources that satisfies s. 281.33 (2), Wis. Stats., such that activities directed and supervised by WisDOT are exempt from this model ordinance.

S.05 DEFINITIONS.

- (1) "Administering authority" means a governmental employee, or a regional planning commission empowered under s. 60.627, Wis. Stats., that is designated by the Town Chair to administer this ordinance.
- (2) "Agricultural facilities and practices" has the meaning in s. 281.16(1), Wis. Stats.
- (3) "Average annual rainfall" means a calendar year of precipitation, excluding snow, which is considered typical.
- (4) "Best management practice" or "BMP" means structural or non-structural measures, practices,

techniques or devices employed to avoid or minimize soil, sediment or pollutants carried in runoff to waters of the state.

- (5) "Business day" means a day the office of the Town Engineer is routinely and customarily open for business.
- (6) "Cease and desist order" means a court-issued order to halt land disturbing construction activity that is being conducted without the required permit.
- (7) "Construction site" means an area upon which one or more land disturbing construction activities occur, including areas that are part of a larger common plan of development or sale where multiple separate and distinct land disturbing construction activities may be taking place at different times on different schedules but under one plan.
- (8) "Division of land" means the creation from one parcel of [number] or more parcels or building sites of [number] or fewer acres each in area where such creation occurs at one time or through the successive partition within a 5 year period.
- (9) "Erosion" means the process by which the land's surface is worn away by the action of wind, water, ice or gravity.
- (10) "Erosion and sediment control plan" means a comprehensive plan developed to address pollution caused by erosion and sedimentation of soil particles or rock fragments during construction.
- (11) "Extraterritorial" means the unincorporated area within 3 miles of the corporate limits of a first, second, or third class city, or within 1.5 miles of a fourth class city or village.
- (12) "Final stabilization" means that all land disturbing construction activities at the construction site have been completed and that a uniform perennial vegetative cover has been established, with a density of at least 70 percent of the cover, for the unpaved areas and areas not covered by permanent structures, or that employ equivalent permanent stabilization measures.
- (13) "Governing body" means town board of supervisors, county board of supervisors, city council, village board of trustees or village council.
- (14) "Land disturbing construction activity" means any man-made alteration of the land surface resulting in a change in the topography or existing vegetative or non-vegetative soil cover, that may result in runoff and lead to an increase in soil erosion and movement of sediment into waters of the state. Land disturbing construction activity includes clearing and grubbing, demolition, excavating, pit trench dewatering, filling and grading activities.
- (15) "MEP" or "maximum extent practicable" means a level of implementing best management practices in order to achieve a performance standard specified in this chapter which takes into account the best available technology, cost effectiveness and other competing issues such as human safety and welfare, endangered and threatened resources, historic properties and geographic features. MEP allows flexibility in the way to meet the performance standards and may vary based on the performance standard and site conditions.

- (16) "Performance standard" means a narrative or measurable number specifying the minimum acceptable outcome for a facility or practice.
- (17) "Permit" means a written authorization made by the Town Engineer to the applicant to conduct land disturbing construction activity or to discharge post-construction runoff to waters of the state.
- (18) "Pollutant" has the meaning given in s. 283.01 (13), Wis. Stats.
- (19) "Pollution" has the meaning given in s. 281.01 (10), Wis. Stats.
- (20) "Responsible party" means any entity holding fee title to the property or performing services to meet the performance standards of this ordinance through a contract or other agreement.
- (21) "Runoff" means storm water or precipitation including rain, snow or ice melt or similar water that moves on the land surface via sheet or channelized flow.
- (22) "Sediment" means settleable solid material that is transported by runoff, suspended within runoff or deposited by runoff away from its original location.
- (23) "Separate storm sewer" means a conveyance or system of conveyances including roads with drainage systems, streets, catch basins, curbs, gutters, ditches, constructed channels or storm drains, which meets all of the following criteria:
 - (a) Is designed or used for collecting water or conveying runoff.
 - (b) Is not part of a combined sewer system.
 - (c) Is not draining to a storm water treatment device or system.
 - (d) Discharges directly or indirectly to waters of the state.
- (24) "Site" means the entire area included in the legal description of the land on which the land disturbing construction activity is proposed in the permit application.
- (25) "Stop work order" means an order issued by the Town Engineer which requires that all construction activity on the site be stopped.
- (26) "Technical standard" means a document that specifies design, predicted performance and operation and maintenance specifications for a material, device or method.
- (27) "Waters of the state" has the meaning given in s. 281.01 (18), Wis. Stats.

S.06 TECHNICAL STANDARDS.

- (1) DESIGN CRITERIA, STANDARDS AND SPECIFICATIONS. All BMPs required to comply with this ordinance shall meet the design criteria, standards and specifications based on any of the following:
 - (a) Applicable design criteria, standards and specifications identified in the *Wisconsin Construction Site Best Management Practice Handbook*, WDNR Pub. WR-222 November 1993 Revision.

- (b) Other design guidance and technical standards identified or developed by the Wisconsin Department of Natural Resources under subchapter V of chapter NR 151, Wis. Adm. Code.
- (c) For this ordinance, average annual basis is calculated using the appropriate annual rainfall or runoff factor, also referred to as the R factor, or an equivalent design storm using a type II distribution, with consideration given to the geographic location of the site and the period of disturbance.

Note to Users : The USLE and its successors RUSLE and RUSLE2, utilize an R factor which has been developed to estimate annual soil erosion, averaged over extended time periods. The R factor can be modified to estimate monthly and single-storm erosion. A design storm can be statistically calculated to provide an equivalent R factor as an average annual calculation.

- (2) OTHER STANDARDS. Other technical standards not identified or developed in sub. (1), may be used provided that the methods have been approved by the Town Engineer.

S.07 PERFORMANCE STANDARDS.

- (1) RESPONSIBLE PARTY. The responsible party shall implement an erosion and sediment control plan, developed in accordance with S. 09, that incorporates the requirements of this section.
- (2) PLAN. A written plan shall be developed in accordance with S. 09 and implemented for each construction site.

Note to Users: The written plan may be that specified within s. NR 216.46, the erosion control portion of a construction plan or other plan.

- (3) EROSION AND OTHER POLLUTANT CONTROL REQUIREMENTS. The plan required under sub. (2) shall include the following:
 - (a) BMPs that, by design, achieve to the maximum extent practicable, a reduction of 80% of the sediment load carried in runoff, on an average annual basis, as compared with no sediment or erosion controls until the construction site has undergone final stabilization. No person shall be required to exceed an 80% sediment reduction to meet the requirements of this paragraph. Erosion and sediment control BMPs may be used alone or in combination to meet the requirements of this paragraph. Credit toward meeting the sediment reduction shall be given for limiting the duration or area, or both, of land disturbing construction activity, or other appropriate mechanism.

Note to Users: Soil loss prediction tools that estimate the sediment load leaving the construction site under varying land and management conditions, or methodology identified in subch. V. of ch. NR 151, Wis. Adm. Code, may be used to calculate sediment reduction.

- (b) Notwithstanding par. (a), if BMPs cannot be designed and implemented to reduce the sediment load by 80%, on an average annual basis, the plan shall include a written and site-specific explanation as to why the 80% reduction goal is not attainable and the sediment load shall be reduced to the maximum extent practicable.
 - (c) Where appropriate, the plan shall include sediment controls to do all of the following to the maximum extent practicable:
 - 1. Prevent tracking of sediment from the construction site onto roads and other paved surfaces.
 - 2. Prevent the discharge of sediment as part of site de-watering.
 - 3. Protect the separate storm drain inlet structure from receiving sediment.
 - (d) The use, storage and disposal of chemicals, cement and other compounds and materials used on the construction site shall be managed during the construction period, to prevent their entrance into waters of the state. However, projects that require the placement of these materials in waters of the state, such as constructing bridge footings or BMP installations, are not prohibited by this paragraph.
- (4) LOCATION. The BMPs used to comply with this section shall be located prior to runoff entering waters of the state.

Note to Users: While regional treatment facilities are appropriate for control of post-construction pollutants, they should not be used for construction site sediment removal.

- (5) ALTERNATE REQUIREMENTS. The Town Engineer may establish storm water management requirements more stringent than those set forth in this section if the Town Engineer determines that an added level of protection is needed for sensitive resources.

S.08 PERMITTING REQUIREMENTS, PROCEDURES AND FEES.

- (1) **PERMIT REQUIRED.** No responsible party may commence a land disturbing construction activity subject to this ordinance without receiving prior approval of an erosion and sediment control plan for the site and a permit from the Town Engineer.
- (2) **PERMIT APPLICATION AND FEES.** At least one responsible party desiring to undertake a land disturbing construction activity subject to this ordinance shall submit an application for a permit and an erosion and sediment control plan that meets the requirements of S.09 and shall pay an application fee of [amount] to the Town Engineer. By submitting an application, the applicant is authorizing the Town Engineer to enter the site to obtain information required for the review of the erosion and sediment control plan.
- (3) **REVIEW AND APPROVAL OF PERMIT APPLICATION.** The Town Engineer shall review any permit application that is submitted with an erosion and sediment control plan, and the required fee. The following approval procedure shall be used:
 - (a) Within [number] business days of the receipt of a complete permit application, as required by sub. (2), the Town Engineer shall inform the applicant whether the application and plan are approved or disapproved based on the requirements of this ordinance.
 - (b) If the permit application and plan are approved, the Town Engineer shall issue the permit.
 - (c) If the permit application or plan is disapproved, the Town Engineer shall state in writing the reasons for disapproval.
 - (d) The Town Engineer may request additional information from the applicant. If additional information is submitted, the Town Engineer shall have [number] business days from the date the additional information is received to inform the applicant that the plan is either approved or disapproved.
 - (e) Failure by the Town Engineer to inform the permit applicant of a decision within [number] business days of a required submittal shall be deemed to mean approval of the submittal and the applicant may proceed as if a permit had been issued.
- (4) **SURETY BOND.** As a condition of approval and issuance of the permit, the Town Engineer may require the applicant to deposit a surety bond or irrevocable letter of credit to guarantee a good faith execution of the approved erosion control plan and any permit conditions.
- (5) **PERMIT REQUIREMENTS.** All permits shall require the responsible party to:

- (a) Notify the Town Engineer within 48 hours of commencing any land disturbing construction activity.
 - (b) Notify the Town Engineer of completion of any BMPs within 14 days after their installation.
 - (c) Obtain permission in writing from the Town Engineer prior to any modification pursuant to S.09(3) of the erosion and sediment control plan.
 - (d) Install all BMPs as identified in the approved erosion and sediment control plan.
 - (e) Maintain all road drainage systems, stormwater drainage systems, BMPs and other facilities identified in the erosion and sediment control plan.
 - (f) Repair any siltation or erosion damage to adjoining surfaces and drainage ways resulting from land disturbing construction activities and document repairs in a site erosion control log.
 - (g) Inspect the BMPs within 24 hours after each rain of 0.5 inches or more which results in runoff during active construction periods, and at least once each week, make needed repairs and document the findings of the inspections in a site erosion control log with the date of inspection, the name of the person conducting the inspection, and a description of the present phase of the construction at the site.
 - (h) Allow the Town Engineer to enter the site for the purpose of inspecting compliance with the erosion and sediment control plan or for performing any work necessary to bring the site into compliance with the control plan. Keep a copy of the erosion and sediment control plan at the construction site.
- (6) **PERMIT CONDITIONS.** Permits issued under this section may include conditions established by Town Engineer in addition to the requirements set forth in sub. (5), where needed to assure compliance with the performance standards in S.07.
- (7) **PERMIT DURATION.** Permits issued under this section shall be valid for a period of 180 days, or the length of the building permit or other construction authorizations, whichever is longer, from the date of issuance. The Town Engineer may extend the period one or more times for up to an additional 180 days. The Town Engineer may require additional BMPs as a condition of the extension if they are necessary to meet the requirements of this ordinance.
- (8) **MAINTENANCE.** The responsible party throughout the duration of the construction activities shall maintain all BMPs necessary to meet the requirements of this ordinance until the site has undergone final stabilization.

S.09 EROSION AND SEDIMENT CONTROL PLAN, STATEMENT, AND AMENDMENTS.

(1) EROSION AND SEDIMENT CONTROL PLAN.

- (a) An erosion and sediment control plan shall be prepared and submitted to the Town Engineer.
- (b) The erosion and sediment control plan shall be designed to meet the performance standards in S.07 and other requirements of this ordinance.
- (c) The erosion and sediment control plan shall address pollution caused by soil erosion and sedimentation during construction and up to final stabilization of the site. The erosion and sediment control plan shall include, at a minimum, the following items:
 - 1. The name(s) and address(es) of the owner or developer of the site, and of any consulting firm retained by the applicant, together with the name of the applicant's principal contact at such firm. The application shall also include start and end dates for construction.
 - 2. Description of the site and the nature of the construction activity, including representation of the limits of land disturbance on a United States Geological Service 7.5 minute series topographic map.
 - 3. A sequence of construction of the development site, including stripping and clearing; rough grading; construction of utilities, infrastructure, and buildings; and final grading and landscaping. Sequencing shall identify the expected date on which clearing will begin, the estimated duration of exposure of cleared areas, areas of clearing, installation of temporary erosion and sediment control measures, and establishment of permanent vegetation.
 - 4. Estimates of the total area of the site and the total area of the site that is expected to be disturbed by construction activities.
 - 5. Estimates, including calculations, if any, of the runoff coefficient of the site before and after construction activities are completed.
 - 6. Calculations to show the expected percent reduction in the average annual sediment load carried in runoff as compared to no sediment or erosion controls.
 - 7. Existing data describing the surface soil as well as subsoils.
 - 8. Depth to groundwater, as indicated by Natural Resources Conservation Service soil information where available.
 - 9. Name of the immediate named receiving water from the United States Geological Service 7.5 minute series topographic maps.
- (d) The erosion and sediment control plan shall include a site map. The site map shall include the following items and shall be at a scale not greater than 100 feet per inch and at a contour interval not to exceed five feet.

1. Existing topography, vegetative cover, natural and engineered drainage systems, roads and surface waters. Lakes, streams, wetlands, channels, ditches and other watercourses on and immediately adjacent to the site shall be shown. Any identified 100-year flood plains, flood fringes and floodways shall also be shown.
 2. Boundaries of the construction site.
 3. Drainage patterns and approximate slopes anticipated after major grading activities.
 4. Areas of soil disturbance.
 5. Location of major structural and non-structural controls identified in the plan.
 6. Location of areas where stabilization practices will be employed.
 7. Areas which will be vegetated following construction.
 8. Areal extent of wetland acreage on the site and locations where storm water is discharged to a surface water or wetland.
 9. Locations of all surface waters and wetlands within one mile of the construction site.
 10. An alphanumeric or equivalent grid overlying the entire construction site map.
- (e) Each erosion and sediment control plan shall include a description of appropriate controls and measures that will be performed at the site to prevent pollutants from reaching waters of the state. The plan shall clearly describe the appropriate control measures for each major activity and the timing during the construction process that the measures will be implemented. The description of erosion controls shall include, when appropriate, the following minimum requirements:
1. Description of interim and permanent stabilization practices, including a practice implementation schedule. Site plans shall ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized.
 2. Description of structural practices to divert flow away from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from the site. Unless otherwise specifically approved in writing by the Town Engineer, structural measures shall be installed on upland soils.
 3. Management of overland flow at all sites, unless otherwise controlled by outfall controls.
 4. Trapping of sediment in channelized flow.
 5. Staging construction to limit bare areas subject to erosion.
 6. Protection of downslope drainage inlets where they occur.
 7. Minimization of tracking at all sites.
 8. Clean up of off-site sediment deposits.
 9. Proper disposal of building and waste materials at all sites.

10. Stabilization of drainage ways.
 11. Control of soil erosion from dirt stockpiles.
 12. Installation of permanent stabilization practices as soon as possible after final grading.
 13. Minimization of dust to the maximum extent practicable.
- (f) The erosion and sediment control plan shall require that velocity dissipation devices be placed at discharge locations and along the length of any outfall channel, as necessary, to provide a non-erosive flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected.

Note to Users: The plan requirements of this subsection will meet the erosion control plan requirements of s. NR 216.46, Wis. Adm. Code, when prepared in accordance with good engineering practices and the design criteria, standards and specifications outlined in the *Wisconsin Construction Site Best Management Practice Handbook* (WDNR Pub. WR-222 November 1993 Revision).

- (2) **EROSION AND SEDIMENT CONTROL PLAN STATEMENT.** For each construction site identified under S.04 (1)(c), an erosion and sediment control plan statement shall be prepared. This statement shall be submitted to the Town Engineer. The control plan statement shall briefly describe the site, including a site map. Further, it shall also include the best management practices that will be used to meet the requirements of the ordinance, including the site development schedule.
- (3) **AMENDMENTS.** The applicant shall amend the plan if any of the following occur:
- (a) There is a change in design, construction, operation or maintenance at the site which has the reasonable potential for the discharge of pollutants to waters of the state and which has not otherwise been addressed in the plan.
 - (b) The actions required by the plan fail to reduce the impacts of pollutants carried by construction site runoff.
 - (c) The Town Engineer notifies the applicant of changes needed in the plan.

S.10 FEE SCHEDULE.

The fees referred to in other sections of this ordinance shall be established by the Town Engineer and may from time to time be modified by resolution. A schedule of the fees established by the Town Engineer shall be available for review in [location].

S.11 INSPECTION.

If land disturbing construction activities are being carried out without a permit required by this ordinance, the Town Engineer may enter the land pursuant to the provisions of ss. 66.0119(1), (2), and (3), Wis. Stats.

S.12 ENFORCEMENT.

- (1) The Town Engineer may post a stop-work order if any of the following occurs:
 - (a) Any land disturbing construction activity regulated under this ordinance is being undertaken without a permit.
 - (b) The erosion and sediment control plan is not being implemented in a good faith manner.
 - (c) The conditions of the permit are not being met.

Note to Users: The Town Engineer should inspect any construction site that holds a permit under this chapter at least once a month during the period starting March 1 and ending October 31 and at least 2 times during the period starting November 1 and ending February 28 to ensure compliance with the approved sediment and erosion control plan.

- (2) If the responsible party does not cease activity as required in a stop-work order posted under this section or fails to comply with the erosion and sediment control plan or permit conditions, the Town Engineer may revoke the permit.
- (3) If the responsible party, where no permit has been issued, does not cease the activity after being notified by the Town Engineer, or if a responsible party violates a stop-work order posted under sub. (1), the Town Engineer may request the town attorney to obtain a cease and desist order in any court with jurisdiction.
- (4) The Town Engineer may retract the stop-work order issued under sub. (1) or the permit revocation under sub. (2).
- (5) After posting a stop-work order under sub. (1), the Town Engineer may issue a notice of intent to the responsible party of its intent to perform work necessary to comply with this ordinance. The Town Engineer may go on the land and commence the work after issuing the notice of intent. The costs of the work performed under this subsection by the Town Engineer, plus interest at the rate authorized by Town Engineer shall be billed to the responsible party. In the event a responsible party fails to pay the amount due, the clerk shall enter the amount due on the tax rolls

and collect as a special assessment against the property pursuant to subch. VII of ch. 66, Wis. Stats.

- (6) Any person violating any of the provisions of this ordinance shall be subject to a forfeiture of not less than [amount] nor more than [amount] and the costs of prosecution for each violation. Each day a violation exists shall constitute a separate offense.
- (7) Compliance with the provisions of this ordinance may also be enforced by injunction in any court with jurisdiction. It shall not be necessary to prosecute for forfeiture or a cease and desist order before resorting to injunctive proceedings.

Note to Users: Injunctive orders are authorized pursuant to s. 59.69(11), 61.35, or 62.23(8), Wis. Stats., for counties, villages and towns with village powers, and cities respectively.

S.13 APPEALS.

- (1) BOARD OF [APPEALS or ADJUSTMENT]. The board of [appeals or adjustment] created pursuant to section [number] of the town's ordinance pursuant to s. 60.65, Wis. Stats.:
 - (a) Shall hear and decide appeals where it is alleged that there is error in any order, decision or determination made by the Town Engineer in administering this ordinance except for cease and desist orders obtained under S.12 (3).
 - (b) Upon appeal, may authorize variances from the provisions of this ordinance which are not contrary to the public interest and where owing to special conditions a literal enforcement of the provisions of the ordinance will result in unnecessary hardship; and
 - (c) Shall use the rules, procedures, duties and powers authorized by statute in hearing and deciding appeals and authorizing variances.
- (2) WHO MAY APPEAL. Appeals to the board of [appeals or adjustment] may be taken by any aggrieved person or by any office, department, board, or bureau of the Town of Barnes affected by any decision of the Town Engineer.

S.14 SEVERABILITY.

If a court of competent jurisdiction judges any section, clause, provision or portion of this ordinance unconstitutional or invalid, the remainder of the ordinance shall remain in force and not be affected by such judgment.

S.15 EFFECTIVE DATE.

This ordinance shall be in force and effect from and after its adoption and publication. The above and foregoing ordinance was duly adopted by the Town Chair of the Town of Barnes on the [number] day of [month], [year].

Approved: _____

Attested _____

Published on [day, month, and year].

Appendix D-3

Phosphorus

BAYFIELD COUNTY

CHAPTER _____

ESTABLISHING REGULATIONS FOR LAWN FERTILIZER APPLICATION AND SALE

- X.01 Authority.
- X.02 Purpose And Intent.
- X.03 Applicability.
- X.04 Definitions.
- X.05 Regulation Of The Use And Application Of Law Fertilizer.
- X.06 Exemptions.
- X.07 Sale of Fertilizer Containing Phosphorus.

- X.08 Enforcement.
- X.09 Penalty.
- X.10 Severability Clause.

X.01 AUTHORITY. This chapter is recommended by the Bayfield County Land Conservation Committee and adopted by the Bayfield County Board of Supervisors under the authority of sec. 92.17, Wis. Stats.

X.02 PURPOSE AND INTENT. The Bayfield County Board of Supervisors finds that Bayfield County’s lakes and streams are a natural asset, which enhance the environmental, recreational, cultural and economic resources of the area and contribute to the general health and welfare of the public. The Board further finds that regulating the amount of nutrients and contaminants, including phosphorus contained in fertilizer, entering the lakes will improve and maintain lake water quality.

X.03 APPLICABILITY. (1) This ordinance applies in all areas of Bayfield County. (2) Cities and villages wholly or partially in Bayfield County may assume administration and regulation of lawn fertilizer application and sale if they have adopted ordinances that include standards at least as restrictive as those described in ss. X.05 – X.09.

X.04 DEFINITIONS. (1) *Agricultural use* has the meaning set forth in sec. 10.01(2a). (2) *Fertilizer* has the meaning set forth in sec. 94.64(1)(e), Wis. Stats. (3) *Lawn fertilizer* means any fertilizer,

whether distributed by property owner, renter or commercial entity, distributed for nonagricultural use, such as for lawns, golf courses, parks and cemeteries. *Lawn fertilizer* does not include fertilizer products intended primarily for garden and indoor plant application.

X.05 REGULATION OF THE USE AND APPLICATION OF LAWN FERTILIZER.

- (1) Effective _____, _____, no person shall apply any lawn fertilizer within Bayfield County that is labeled as containing more than 0%, 1%, 1.5% phosphorus or other compound containing phosphorus, such as phosphate, except as provided in section X.06.
- (2) No lawn fertilizer shall be applied when the ground is frozen.
- (3) No person shall apply fertilizer to any impervious surface including parking lots, roadways, and sidewalks. If such application occurs, the fertilizer must be immediately contained and either legally applied to turf or placed in an appropriate container.

X.06 EXEMPTIONS. The prohibition against the use of fertilizer under section X.05 shall not apply to:

- (1) Newly established turf or lawn areas during their first growing season.
- (2) Turf or lawn areas that soil tests, performed within the past three years by a state certified soil testing laboratory, confirm are below phosphorus levels established by the University of Wisconsin Extension Service. The lawn fertilizer application shall not contain an amount of phosphorus exceeding the amount and rate of application recommended in the soil test evaluation.
- (3) Agricultural uses, vegetable and flower gardens, or application to trees or shrubs.
- (4) Yard waste compost, biosolids or other similar materials that are primarily organic in nature and are applied to improve the physical condition of the soil.

X.07 SALE OF FERTILIZER CONTAINING PHOSPHORUS. (1) Effective _____, 200_,

no person shall sell or offer for sale any lawn fertilizer within Bayfield County that is labeled as containing more than _____% phosphorus, or other compound containing phosphorus, such as phosphate, except such fertilizer may be sold for use as provided in section X.06.

(2) Effective _____, 200_, no person shall display lawn fertilizer containing phosphorus. Signs may be posted advising customers that lawn fertilizer containing phosphorus is available upon request for uses permitted by s. X.06. X.01 – X.07(2)

(3) Effective _____, 200_, a sign containing the regulations set forth in this ordinance and the effects of phosphorus on Bayfield County's waters must be prominently displayed where lawn fertilizers are sold.

X.08 ENFORCEMENT. Violations of this ordinance will be enforced by the Environmental Health Section of the Public Health Division, Department of Human Services.

X.09 PENALTY. Any person who violates section X.05 in the application of fertilizer at his or her residence shall be subject to a forfeiture of \$25 per violation. Any commercial fertilizer applicator, residential or commercial developer, industrial or commercial owner, or other person who violates section X.05, and any person who violates section X.07, shall be subject to a forfeiture of \$50 for the first violation within a twelve month period, \$150 for the second violation within a twelve month period, and \$300 for the third and each subsequent violation within a twelve month period.

X.10 SEVERABILITY CLAUSE. If any section, provision or portion of this ordinance is ruled invalid by a court, the remainder of the ordinance shall not for that reason be rendered ineffective or invalid.

x.11 EFFECTIVE DATE This ordinance shall be in force and effective from after its adoption and publication. The above foregoing ordinance was duly adopted by the Bayfield County Board on the _____ day of _____, 200_.

APPROVED: _____

ATTESTED: _____

PUBLISHED: _____

Appendix E

Lake Watershed Community Survey

Tabulation Results

1. Which Lake do you live on or nearest to?

	Count	%	Cum%
Sweet Lake	18	4.1	4.1
Upper Eau Claire Lake	107	24.4	28.5
Bony Lake	34	7.8	36.3
Lower Eau Claire Lake	76	17.4	53.7
Shunenberg Lake	8	1.8	55.5
Robinson	31	7.1	62.6
Middle Eau Claire Lake	119	27.2	89.7
Smith Lake	4	0.9	90.6
Birch Lake	31	7.1	97.7
Cranberry Lake	3	0.7	98.4
Blank Responses	7	1.6	100.0
TOTAL	438	100.0	100.0

2. Which Lake do you spend the most time on?

	Count	%	Cum%
Sweet Lake	17	3.9	3.9
Upper Eau Claire Lake	119	27.2	31.1
Bony Lake	30	6.8	37.9
Lower Eau Claire Lake	78	17.8	55.7
Shunenberg Lake	5	1.1	56.8
Robinson	35	8.0	64.8
Middle Eau Claire Lake	119	27.2	92.0
Smith Lake	2	0.5	92.5
Birch Lake	20	4.6	97.0
Cranberry Lake	4	0.9	97.9
Blank Responses	9	2.1	100.0
TOTAL	438	100.0	100.0

3. How many years have you been living on and/or visiting the lake (circled in question #2)?

	Count	%	Cum%
Less than 1 year	3	0.7	0.7
1-5 years	32	7.3	8.0
6-10 years	48	11.0	18.9
11-15 years	44	10.0	29.0
16-20 years	37	8.4	37.4
over 20 years	268	61.2	98.6
Blank Responses	6	1.4	100.0
TOTAL	438	100.0	100.0

4. What is your opinion of the use of the lake (circled in question #2) this summer?

	Count	%	Cum%
under used	33	7.5	7.5
don't know	33	7.5	15.1
used at the right level	298	68.0	83.1
over used	66	15.1	98.2
Blank Responses	8	1.8	100.0
TOTAL	438	100.0	100.0

5. What term best describes the water clarity of the lake (circled in question #2)?

	Count	%	Cum%
clear	342	78.1	78.1
cloudy	43	9.8	87.9
other	43	9.8	97.7
Blank Responses	10	2.3	100.0
TOTAL	438	100.0	100.0

6. What factors prompted your answer to #5?

(all-that-apply)

	Count	%	Cum%
amount of algae	109	24.9	24.9
ability to see the lake bottom	367	83.8	108.7
thickness of the sediment	63	14.4	123.1
Blank Responses	15	3.4	126.5
TOTAL	423	96.6	126.5
	554		

7. During your visits to the lake (circled in question #2), in which of the following activities have you participated?

(all-that-apply)

	Count	%	Cum%
swimming	351	80.1	80.1
boating (motor/pontoon)	369	84.2	164.4
jet skiing	60	13.7	178.1
other	32	7.3	185.4
canoeing/rowing/kayaking	254	58.0	243.4
fishing/ice fishing	332	75.8	319.2
ice skating	64	14.6	333.8
winter cross-country skiing	112	25.6	359.4
wildlife observation	289	66.0	425.3
hunting	57	13.0	438.4
Blank Responses	4	0.9	439.3
TOTAL	434	99.1	439.3
	1924		

8. To what extent does water quality affect your decision to use the lake?

	Count	%	Cum%
little to no effect	43	9.8	9.8
some effect	100	22.8	32.6
great effect	282	64.4	97.0
Blank Responses	13	3.0	100.0
TOTAL	438	100.0	100.0

9a. If you fish, how would you rate the quality of fishing this past season compared to over the last 5 years?

	Count	%	Cum%
better	28	6.4	6.4
worse	110	25.1	31.5
about the same	158	36.1	67.6
don't know	30	6.8	74.4
didn't fish	64	14.6	89.0
Blank Responses	48	11.0	100.0
TOTAL	438	100.0	100.0

9b. If you fish, how would you rate the quality of fishing this past season compared to over the last 10 years?

	Count	%	Cum%
better	27	6.2	6.2
worse	157	35.8	42.0
about the same	93	21.2	63.2
don't know	49	11.2	74.4
didn't fish	56	12.8	87.2
Blank Responses	56	12.8	100.0
TOTAL	438	100.0	100.0

9c. If you fish, how would you rate the quality of fishing this past season compared to over the last 20 years?

	Count	%	Cum%
better	20	4.6	4.6
worse	161	36.8	41.3
about the same	43	9.8	51.1
don't know	100	22.8	74.0
didn't fish	51	11.6	85.6
Blank Responses	63	14.4	100.0
TOTAL	438	100.0	100.0

10a. How would you rate the health of the lake (circled in question #2) this past summer compared to last year?

	Count	%	Cum%
better	11	2.5	2.5
worse	131	29.9	32.4
about the same	247	56.4	88.8
don't know	38	8.7	97.5
Blank Responses	11	2.5	100.0
TOTAL	438	100.0	100.0

10b. How would you rate the health of the lake (circled in question #2) this past summer compared to the past 5 years?

	Count	%	Cum%
better	13	3.0	3.0
worse	154	35.2	38.1
about the same	218	49.8	87.9
don't know	37	8.4	96.3
Blank Responses	16	3.7	100.0
TOTAL	438	100.0	100.0

10c. How would you rate the health of the lake (circled in question #2) this past summer compared to the past 10 years?

	Count	%	Cum%
better	14	3.2	3.2
worse	164	37.4	40.6
about the same	173	39.5	80.1
don't know	64	14.6	94.7
Blank Responses	23	5.3	100.0
TOTAL	438	100.0	100.0

10d. How would you rate the health of the lake (circled in question #2) this past summer compared to the past 20 years?

	Count	%	Cum%
better	19	4.3	4.3
worse	153	34.9	39.3
about the same	112	25.6	64.8
don't know	117	26.7	91.6
Blank Responses	37	8.4	100.0
TOTAL	438	100.0	100.0

11. Do you or any member of your household belong to Barnes/Eau Claire Lakes Property Owners Association?

	Count	%	Cum%
yes	201	45.9	45.9
no	227	51.8	97.7
Blank Responses	10	2.3	100.0
TOTAL	438	100.0	100.0

15. Which term best describes the lake's public access?

	Count	%	Cum%
good	282	64.4	64.4
fair	99	22.6	87.0
poor	32	7.3	94.3
Blank Responses	25	5.7	100.0
TOTAL	438	100.0	100.0

16a. Does your property have a landscaped vegetative barrier to reduce erosion or runoff?

	Count	%	Cum%
Yes	206	47.0	47.0
No	128	29.2	76.3
I'm Not Sure	24	5.5	81.7
Blank Responses	80	18.3	100.0
TOTAL	438	100.0	100.0

16b. Does your property have undeveloped, natural vegetation to reduce erosion or runoff?

	Count	%	Cum%
Yes	351	80.1	80.1
No	36	8.2	88.4
I'm Not Sure	20	4.6	92.9
Blank Responses	31	7.1	100.0
TOTAL	438	100.0	100.0

16c. Does your property have a grass drainage ditch to reduce erosion or runoff?

	Count	%	Cum%
Yes	54	12.3	12.3
No	216	49.3	61.6
I'm Not Sure	33	7.5	69.2
Blank Responses	135	30.8	100.0
TOTAL	438	100.0	100.0

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16d. Does your property have a rain garden to reduce erosion or runoff?

	Count	%	Cum%
Yes	20	4.6	4.6
No	241	55.0	59.6
I'm Not Sure	42	9.6	69.2
Blank Responses	135	30.8	100.0
TOTAL	438	100.0	100.0

16e. Does your property have rain water collection to reduce erosion or runoff?

	Count	%	Cum%
Yes	37	8.4	8.4
No	244	55.7	64.2
I'm Not Sure	26	5.9	70.1
Blank Responses	131	29.9	100.0
TOTAL	438	100.0	100.0

17. How would you feel about "stricter" enforcement of the current lakeshore ordinance requiring lake shore property owners to have a vegetative buffer along the shoreline?

	Count	%	Cum%
Strongly support	129	29.5	29.5
Support	103	23.5	53.0
Neutral	72	16.4	69.4
Oppose	58	13.2	82.6
Strongly oppose	44	10.0	92.7
Don't know	17	3.9	96.6
Blank Responses	15	3.4	100.0
TOTAL	438	100.0	100.0

19. Which, if any, of the following do you think causes or may cause problems for surface waters nearest you?
(all-that-apply)

	Count	%	Cum%
fertilzrs/pestcds from lk homes	251	57.3	57.3
Improper disposal of chemicals	83	18.9	76.3
Farm fertilizers	26	5.9	82.2
Erosion from crop fields	13	3.0	85.2
Storm water runoff	107	24.4	109.6
High density development	204	46.6	156.2
Manure from barn yards	11	2.5	158.7
Septic systems	212	48.4	207.1
Erosion from construction site	50	11.4	218.5
Grass clippings and/or leaves	74	16.9	235.4
Pollution from roads/highways	51	11.6	247.0
Lawns mowed to water	219	50.0	297.0
Blank Responses	68	15.5	312.6
TOTAL	370	84.5	312.6

1369

20. What do you feel should be the permitted density of dwelling units per 150 feet of shoreline for "Planned Unit Developments"?

	Count	%	Cum%
4 per 150 feet	24	5.5	5.5
3 per 150 feet	9	2.1	7.5
2 per 150 feet	48	11.0	18.5
1 per 150 feet	322	73.5	92.0
Blank Responses	35	8.0	100.0
TOTAL	438	100.0	100.0

21. Would you support ordinances that would restrict the use of phosphorus-based fertilizers?

	Count	%	Cum%
yes	373	85.2	85.2
no	30	6.8	92.0
Blank Responses	35	8.0	100.0
TOTAL	438	100.0	100.0

22. Which group or groups do you feel should be responsible for lake improvements?
(all-that-apply)

	Count	%	Cum%
local watershed residents	75	17.1	17.1
non-resident users	30	6.8	24.0
Township and County government	194	44.3	68.3
other	20	4.6	72.8
indiv lakeshore property ownrs	166	37.9	110.7
Barnes/EC Lks Prop Ownrs Assoc	127	29.0	139.7
State and Federal government	98	22.4	162.1
Blank Responses	37	8.4	170.5
TOTAL	401	91.6	170.5
	747		

24a. How often do you use the lake to entertain friends?

	Count	%	Cum%
1-5 times per year	141	32.2	32.2
6-10 times per year	106	24.2	56.4
11-20 times per year	60	13.7	70.1
More than 20 times per year	43	9.8	79.9
Blank Responses	88	20.1	100.0
TOTAL	438	100.0	100.0

24b. How often do you use the lake for fishing?

	Count	%	Cum%
1-5 times per year	98	22.4	22.4
6-10 times per year	71	16.2	38.6
11-20 times per year	69	15.8	54.3
More than 20 times per year	96	21.9	76.3
Blank Responses	104	23.7	100.0
TOTAL	438	100.0	100.0

24c. How often do you use the lake for ice fishing?

	Count	%	Cum%
1-5 times per year	101	23.1	23.1
6-10 times per year	28	6.4	29.5
11-20 times per year	19	4.3	33.8
More than 20 times per year	17	3.9	37.7
Blank Responses	273	62.3	100.0
TOTAL	438	100.0	100.0

24d. How often do you use the lake for snowmobiling?

	Count	%	Cum%
1-5 times per year	43	9.8	9.8
6-10 times per year	18	4.1	13.9
11-20 times per year	12	2.7	16.7
More than 20 times per year	9	2.1	18.7
Blank Responses	356	81.3	100.0
TOTAL	438	100.0	100.0

24e. How often do you use the lake for swimming?

	Count	%	Cum%
1-5 times per year	64	14.6	14.6
6-10 times per year	71	16.2	30.8
11-20 times per year	67	15.3	46.1
More than 20 times per year	145	33.1	79.2
Blank Responses	91	20.8	100.0
TOTAL	438	100.0	100.0

24f. How often do you use the lake for boating?

	Count	%	Cum%
1-5 times per year	50	11.4	11.4
6-10 times per year	64	14.6	26.0
11-20 times per year	93	21.2	47.3
More than 20 times per year	144	32.9	80.1
Blank Responses	87	19.9	100.0
TOTAL	438	100.0	100.0

24g. How often do you use the lake for non-motorized boating (canoe/kayak)?

	Count	%	Cum%
1-5 times per year	100	22.8	22.8
6-10 times per year	75	17.1	40.0
11-20 times per year	50	11.4	51.4
More than 20 times per year	70	16.0	67.4
Blank Responses	143	32.6	100.0
TOTAL	438	100.0	100.0

24h. How often do you use the lake for appreciating peace and tranquility?

	Count	%	Cum%
1-5 times per year	30	6.8	6.8
6-10 times per year	35	8.0	14.8
11-20 times per year	48	11.0	25.8
More than 20 times per year	260	59.4	85.2
Blank Responses	65	14.8	100.0
TOTAL	438	100.0	100.0

24i. How often do you use the lake for observing wildlife?

	Count	%	Cum%
1-5 times per year	29	6.6	6.6
6-10 times per year	34	7.8	14.4
11-20 times per year	50	11.4	25.8
More than 20 times per year	249	56.8	82.6
Blank Responses	76	17.4	100.0
TOTAL	438	100.0	100.0

24j. How often do you use the lake for campfires/picnics

	Count	%	Cum%
1-5 times per year	88	20.1	20.1
6-10 times per year	71	16.2	36.3
11-20 times per year	48	11.0	47.3
More than 20 times per year	64	14.6	61.9
Blank Responses	167	38.1	100.0
TOTAL	438	100.0	100.0

24k. How often do you use the lake for other activities?

	Count	%	Cum%
1-5 times per year	16	3.7	3.7
6-10 times per year	7	1.6	5.3
11-20 times per year	6	1.4	6.6
More than 20 times per year	16	3.7	10.3
Blank Responses	393	89.7	100.0
TOTAL	438	100.0	100.0

26. Which actions would you support as a way to help improve water quality of the lake (circled in question #2)?
(all-that-apply)

	Count	%	Cum%
enforcement of fertilizr ordin	327	74.7	74.7
enforce zoning and ordinances	296	67.6	142.2
enforce shorelnd buffer ordin	204	46.6	188.8
keep everyone informed	296	67.6	256.4
build/improve grass swales	166	37.9	294.3
monitor lake quality	321	73.3	367.6
watch for/report exotic plants	315	71.9	439.5
financly suppt lk imprv projts	225	51.4	490.9
other ideas	23	5.3	496.1
Blank Responses	36	8.2	504.3
TOTAL	402	91.8	504.3
	2209		

27. I feel there is a problem with the amount of green algae on the lake (circled in question #2)?

	Count	%	Cum%
Strongly agree	47	10.7	10.7
Agree	83	18.9	29.7
Neutral	97	22.1	51.8
Disagree	102	23.3	75.1
Strongly disagree	32	7.3	82.4
Don't know	48	11.0	93.4
Blank Responses	29	6.6	100.0
TOTAL	438	100.0	100.0

28. The lake (circled in question #2) is an important resource to the Town of Barnes and surrounding communities.

	Count	%	Cum%
Strongly agree	295	67.4	67.4
Agree	105	24.0	91.3
Neutral	8	1.8	93.2
Disagree	3	0.7	93.8
Strongly disagree	0	0.0	93.8
Don't know	6	1.4	95.2
Blank Responses	21	4.8	100.0
TOTAL	438	100.0	100.0

29. I would like to see some control over use of personal watercraft (jet-skis).

	Count	%	Cum%
Strongly agree	190	43.4	43.4
Agree	111	25.3	68.7
Neutral	55	12.6	81.3
Disagree	22	5.0	86.3
Strongly disagree	28	6.4	92.7
Don't know	5	1.1	93.8
Blank Responses	27	6.2	100.0
TOTAL	438	100.0	100.0

30. I feel the water quality of the lake (circled in question #2) has improved in recent years?

	Count	%	Cum%
Strongly agree	0	0.0	0.0
Agree	25	5.7	5.7
Neutral	163	37.2	42.9
Disagree	138	31.5	74.4
Strongly disagree	51	11.6	86.1
Don't know	40	9.1	95.2
Blank Responses	21	4.8	100.0
TOTAL	438	100.0	100.0

31. There should be a limit on the maximum horsepower and type of motor used to power boats.

	Count	%	Cum%
Strongly agree	108	24.7	24.7
Agree	86	19.6	44.3
Neutral	65	14.8	59.1
Disagree	73	16.7	75.8
Strongly disagree	73	16.7	92.5
Don't know	13	3.0	95.4
Blank Responses	20	4.6	100.0
TOTAL	438	100.0	100.0

32. Are you a Town of Barnes.....?

	Count	%	Cum%
Seasonal resident	144	32.9	32.9
Year-round resident	105	24.0	56.8
Non-resident property owner	174	39.7	96.6
Blank Responses	15	3.4	100.0
TOTAL	438	100.0	100.0

33. Activities you are aware of that the Lake Association has been involved in.
 (all-that-apply)

	Count	%	Cum%
water quality testing	198	45.2	45.2
supported grant received	95	21.7	66.9
received grant to study EWM	135	30.8	97.7
not aware of activities	186	42.5	140.2
Blank Responses	31	7.1	147.3
TOTAL	407	92.9	147.3
	645		

34. What is the best way for the Barnes/Eau Claire Lakes Property Owners Association to communicate with you?
 (all-that-apply)

	Count	%	Cum%
meetings	78	17.8	17.8
phone call	40	9.1	26.9
newsletter	355	81.1	108.0
newspaper articles	55	12.6	120.5
e-mail	110	25.1	145.7
Blank Responses	25	5.7	151.4
TOTAL	413	94.3	151.4
	663		

35. Do you have special skills that could assist the Lake Property Owners Association?

	Count	%	Cum%
No, I don't think so	312	71.2	71.2
Yes, I believe so	66	15.1	86.3
Blank Responses	60	13.7	100.0
TOTAL	438	100.0	100.0

36. Would you be willing to volunteer for a role in the Barnes/Eau Claire Lakes Property Owners Association?

	Count	%	Cum%
No, I don't think so	278	63.5	63.5
Yes, I believe so	95	21.7	85.2
Blank Responses	65	14.8	100.0
TOTAL	438	100.0	100.0

37. Which category best describes your age?

	Count	%	Cum%
18-30	1	0.2	0.2
31-40	8	1.8	2.1
41-50	81	18.5	20.5
51-60	111	25.3	45.9
61-70	140	32.0	77.9
71 and older	90	20.5	98.4
Blank Responses	7	1.6	100.0
TOTAL	438	100.0	100.0

Summary of Responses

Summary of Property Owner Survey Comments

5. What term best describes the water clarity of the lake? Response to "Other."	
Not as clear this year as in the past.	27
Mucky; weedy	6
Depends on seasons: clear in spring; cloudy late summer	13
Depends on location in lake	3

7. During your visits to the lake, in which of the following activities have you participated?	
Water skiing; tubing; kneeboarding	21
Sailing	13
Snowmobiling	5
Snorkeling	6

12. If you chose "no" in Question #11, what prevents you from joining?	
Didn't know about the Association; never been asked	50
Don't agree with the Association views/goals and approach	31
Time--only occassional/seasonal resident or too busy	52

13. Please list 3 things that you like most about the lake or the watershed surrounding the lake:	
Clarity of water	245
Natural beauty of surroundings and shoreline; scenery	134
Wildlife	97
Fishing	72
Serenity and solitude; relatively low lake traffic and inhabitanace	199

14. Please list 3 things you don't like about the lake or the watersheds surrounding the lake:	
Jet skis, high power motor boats not respecting no wake regulations and time usage restrictions; noisy	137
Overbuilding/development of condos and large homes in lake area	49
Water quality issues: weeds, algae, muck, cray fish; destruction of fish habitat	148

15. Which term best describes the lake's public access?	
Positive responses: in good condition, brand new, easy to launch and access, clean	117
Negative responses: not enough parking, dangerous, landing too shallow, too close to dam/current	83

18. What steps have you taken or plan to take to control runoff on your property?	
Keep lake shore vegetation as natural as possible; plant vegetative buffer	227
Avoid use of fertilizer and lawn chemicals	31
Rip rap wall/rocks on shoreline	20
Rainwater collection; gutters	11
Plant trees, shrubs; allow fallen timbers to remain along shore line	24

22. Which group or groups do you feel should be responsible for lake improvements? Response to "Other."	
DNR	3
All of the above	7
Those that use the lake	5

Summary of Property Owner Survey Comments

23. Given what you know about the lakes, if you could change one thing about them to increase value to you personally, what would you change?

Ban or place further restrictions on jet skis; decrease number of boats with large motors	51
Keep the shoreline natural on all lots; enforce shoreline restrictions that exist	17
Reduce building density; prevent further development	59

24. How often do you use the lake to: Response to "Other".

Cross country ski	10
Sailing/Wind surfing	3
Hunting	3

25. What do you feel is the largest contributor to water quality degradation of the lake? Natural or man-made.

Septic systems	50
Large boats and jet skis--their effect on weeds and gas/oil pollution	70
Cray fish	27
Increased development; high density	36
Fertilizer	58

26. Which actions from the list below would you support as a way to help improve water quality of the lake? Response to "Other."

Eliminate rusty cray fish	4
Test septic systems	4
Ban jet skis/limit	8
My taxes should cover all of this	5

Comments

EAU CLAIRE LAKES SURVEY COMMENTS

August 2006

5. What term best describes the water clarity of the lake? Response to "Other."

"Not as clear this year as in the past."

"More algae."

"I do Secchi and chemical testing on Shunenberg. You probably can get my results from the DNR."

"Semi-cloudy."

"Clear until fall bloom."

"Nowhere near as clear as it used to be."

"Slightly cloudy – more than in previous years."

"At times, somewhat cloudy."

"Generally clear, but we have some tremendous algae blooms at times."

"Somewhat less clear later summer."

"Was clear at one time, but cloudy now."

"Water clear; large amounts of sediment at bottom."

"Don't know."

"Some places clear, others cloudy."

"This summer, heavy algae, broken weeds, cloudy."

"Not as clear as it was."

"Clear in June, cloudy by August."

"Mucky."

"Mostly clear except becomes cloudy in late summer."

"Clear, but not as clear as past years."

"Clear at times, more than usual weeds."

"Two algae blooms and more weed bed damage affected clarity negatively."

"Clean in the spring, cloudy in the summer."

"Both, depending on the time of the year."

"Not as clear as it was ten years ago."

"In between A and B."

"Silty."

"Weather/season dependent."

"2006 late summer appears to be a lot pollen in water."

"Green murky."

"Unusually green in August/fall – not characteristic."

"Secchi disk readings half of previous years."

"Greenish."

"Muddy."

"Somewhat clear."

"Way too much muck."

"Clear for the most part, but cloudy in mid-July and August."

"Birch – very cloudy."

"It used to be a lot clearer."

"Algae noted this year."

"Thick weeds."

"Cloudier than usual this summer."

"The last two years has started to be cloudy."

"Generally clear."

"Not as clear as others."

"Clear beginning of the year, cloudy the end of August."

"Depends on portion of lake."

"Poorest quality in many years."

"Clean but not as clear as it used to be."

"Clear but it used to be clearer."

"Depends on time of year. Overall cloudy combined to past."

"Bay of upper very weedy."

“The clarity is decreasing.”

“Clear, but not as clear previously.”

“Very green in August/September this year. The worst algae we have seen.”

“Lower number of fish; more algae; unhealthy looking weeds; I have noticed increased degradation for the last 10 years.”

7. During your visits to the lake in which of the following activities have you participated? Response to “Other.”

“Water ski, tubing.”

“Water skiing.”

“Sailing, snow shoeing.”

“Sailing.”

“Water skiing.”

“Snowmobile.”

“Snowmobile.”

“Sailing.”

“Water skiing.”

“Tubing.”

“Walking on ice.”

“Paddleboat.”

“Snowmobiling.”

“Sailing.”

“View only.”

“Water skiing.”

“Water skiing.”

“ATV; snowmobiling.”

“Water skiing.”

“Biking.”

“Just enjoying the lake.”

“Sailing.”

“Hiking/sledding/biking.”

“Cycling/running.”

“Snorkeling.”

“Sailing.”

“Snorkeling.”

“Tubing, skiing, sailing – whoa, you guys really missed these.”

“Water skiing and tubing.”

“Snowmobiling across lake.”

“Doing chores around our cabin.”

“Scuba diving.”

“Skiing.”

“Maintaining property.”

“Wildlife photography and birdwatching.”

“Sailing.”

“Water skiing.”

“Photography, water skiing.”

“Sailing, snorkeling.”

“Water skiing.”

“Scuba diving.”

“Forgot all water sports (recreational) – sailboat, water ski, tubing, wake board.”

“Sailing.”

“Paddle boating.”

“Hiking, biking, sailing.”

“Water skiing, sailing, snorkeling.”

“Water skiing.”

“Kneeboarding and water skiing.”

“Water skiing.”

“Water skiing.”

“Peace and tranquility.”

“Water skiing.”

“Dog training.”

“I am a non-motorized-type – rowboats, canoes, bicycles – I believe in the quiet of the forest and water.”

12. If you chose “no” in Question #11, what prevents you from joining?

“Don’t even know when or where they meet.”

“Don’t know about them.”

“No reason – need to become a member.”

“Unable to attend annual meeting because of previous engagements.”

“Don’t care to.”

“No desire.”

“Mostly B.S.”

“Involved in too many things already.”

“Previously had been a member and didn’t feel our lake was adequately represented.”

“Not a joiner.”

“Lack of information.”

“Nothing – plan to join.”

“Don’t need people or meetings.”

“Don’t want to be told what we can do on our lake.”

“Lack of knowledge/awareness.”

“Probably will join when we retire and make our lake home our permanent residence.”

“Prejudice against water skiing and jet ski use (especially limited hours).”

“Haven’t been asked.”

“Should be approached to do so.”

“Have not had enough time.”

“Health issues.”

“I did three years ago, but we always have a lot of company during yearly meetings.”

“Do not live on lake or have access to lake by our home.”

“No special season.”

“Angry, narrow minded people and don’t appreciate my neighbors telling me what I can do with my property.”

“Lack of awareness.”

“Own condo in larger group of condo’s.”

“Not sure.”

“They interfere in property owner’s personal business.”

“Nothing! We’re not aware of the organization. Will most likely join.”

“Nothing prevents joining. I choose to use my time and resources for other activities.”

“Time and activities.”

“No response.”

“Not a full-time resident (yet).”

“Haven’t been approached.”

“Time.”

“Really don’t care to join.”

“They do not want to better the area, they want to close the lake. They are killing the area and property values.”

“Didn’t know about the Association, then heard it is oriented more toward other lakes – not so much lower Eau Claire.”

“We went to the Milfoil meeting at downtown Barnes last year on the year before and signed a paper saying we wanted to join and volunteering to organize a Robinson Lake chapter, but we were never contacted by the Association.”

“Time constraints.”

“Only there weekends and holidays. Still working full-time.”

“No one has asked me join. I’m still mad about getting a lawyer bill on the drag strip problem in the past. That was very poor PR.”

“Belong to Eau Claire Lakes Conservation Club – already pay one fee to them.”

“Plan to join.”

“Not enough time spent at the lake.”

“Nothing! Please contact me or I will find out how to join.”

“Because we don’t live on the lake.”

“Not there year-round. Didn’t know it existed.”
“Time.”
“Not sure. I think it is Barnes Conservation Club. Is it the same?”
“Just haven’t joined.”
“No action taken about sand bar at mouth of Eau Claire River and Lower Eau Claire Lake.”
“Lack of information about the Association.”
“Not enough has been done to keep the lake clean and from being overused.”
“Not up north enough to get interested. We have property on Devil’s. We like bow hunting on our property and the neighbors. Good neighbors.”
“Not around often enough.”
“Does it cost?”
“Money.”
“Attitude toward water skiing and boating.”
“Don’t live in the area.”
“Never thought to do it.”
“Never been asked.”
“Never asked to join. Just learned of its existence.”
“No good reason. We will.”
“I believe all property owners should automatically be a member.”
“Don’t know about it.”
“N/A.”
“We do belong to the Barnes environmental association if that is the above.”
“Lack of available time to become involved.”
“We reside in Eau Claire – plan on becoming involved when we move there.”
“We were unaware of the Association.”
“Seasonal residents.”
“Don’t live in area; would have very limited involvement.”
“I used to belong, but feel that there are too many radicals telling others what to do.”
“Don’t know.”
“Don’t know anything about it.”
“Have not received renewal information (formerly belonged), notices of meetings, etc.”
“Didn’t know there was a group.”
“I have not been contacted to belong.”
“Time.”
“New ownership.”
“Lack of information.”
“Know little about it – belong to Eau Claire Lake Conservation Club.”
“We are not on at the lake when meetings are held.”
“I do not care for clubs and I am not up there as often as I want to be.”
“Nothing.”
“Too negative of a group. Do not promote anything – only negative.”
“Have been told only lakeshore property owners may belong.”
“They only let lake property owners join. We just have back land.”
“The group has changed to one only concerned about a narrow definition of what the lakes are for, how they should be used.”
“Don’t live on lake.”
“Way too many unhappy people trying to dictate to others. Video shorelines, turning people into the constable or zoning. Telling people what they should do (cabin colors, night lights for safety).”
“Not sure.”
“I am not there enough to make the meetings.”
“They never help our lake problem.”
“Probably never had anyone directly ask/recruit me/us.”
“Association’s agenda; Association’s exclusiveness.”
“Not living in the area to be able to attend meetings and getting involved.”
“Not interested in another organization.”
“Not yet a residence on our property.”
“Can’t attend meetings.”
“Nothing.”

“Some years ago, I attended your meeting and was amazed at all the concern for the upper and middle lakes and no concern for the lower.”

“Didn’t know much about it. We do belong to the Eau Claire Lakes Conservation Society.”

“Cost.”

“I have in the past.”

“May this next year.”

“I wasn’t aware of the organization. No one has asked us to join. We’d be happy to join.”

“Only visit, don’t reside there.”

“The Association doesn’t seem to undertake or impact many programs important to us.”

“I would like to.”

“Live off water – thought ECLPOA was for lake property owners.”

“Cost – make more affordable.”

“Don’t use property that much.”

“No reason.”

“The communication of info, projects and annual membership is very very poor. Seems badly run or very disorganized.”

“Not up there enough.”

“Nothing.”

“Time.”

“Nothing. We plan to join this fall.”

“Only live on the lake 5 months a year.”

“Not really sure of the benefits.”

“They are a bunch of hypocrites.”

“I’m not sure what it is.”

“Cost.”

“Missed joining this year – have in the past.”

“Don’t know how to join.”

“They are taking my property rights away. They have a bunch of rule hungry assholes on that board.”

“Did not know it existed.”

“Need information about the Association and an application.”

“I’ve lived near several closed or historic communities. I don’t like the idea of asking others for permission to use my own property the way I see fit.”

“They are a small minority who are trying to control the area. Too many old people who are extremely rude and unfriendly.”

“Never around when meetings are held.”

“I did not know it existed.”

“Were not in area this year to renew membership – have been members in past.”

“Don’t have time to support.”

“Distance and infrequent visits.”

“New to the area.”

“Time.”

“Spend limited time at lake.”

“Seasonal property owner.”

“Not a rear round resident.”

“Dropped membership because the organization has no power to influence policy.”

“View.”

“Don’t know.”

“Not familiar with it.”

“We are not there enough.”

“No reason.”

“Don’t know what you advocate. I think you are often not representing the average ideas of residents from what I know of you.”

“Don’t know. Not up there often.”

“New to area.”

“Not sure if we belong or not.”

“Part-time use; inherited property.”

“Not enough time.”

“Don’t know too much about the association. What I do, I don’t agree with some of the stands.”

“Distraction of building a new home for the past three years.”

“Distance.”

“Meeting times.”

“Time.”

“Don’t know.”

“Never been asked.”

“Use property for vacation and long weekends – distance from property and frequency of visits prevents participation.”

“All geared toward fisherman with no interest in other water sport activities.”

“We haven’t built on our land yet – will hope to build and join very very soon.”

“Unaware of.”

“Time constraints and distance.”

“Don’t want someone else dictating what to do on my property. The association gave absolutely no support to our neighbors when they needed help with benzene in their well water.”

“Not asked to join.”

“Nothing – will join – am retiring and building new house on Middle Lake.”

“Non resident owner – know few people.”

“Lack of knowledge of the Association.”

“Need more info to sign up (please send – will sign up).”

“I’m not sure except that our times in the area are limited and unpredictable.”

“We belong to the Conservation Club – we are not familiar with the Property Owner’s Association.”

“I don’t feel like Don Quixote – jousting with windmills.”

“They’re the Lakeside Mafia. Most of them have forgotten they were once 20 years old.”

“Severe hearing impairment.”

“Didn’t know about it.”

“The people in charge.”

“Not familiar with the organization and don’t know what they do.”

“We spend less than two months total there each year. Some summer – some winter.”

“Lack of information concerning the association.”

“A lot of people in town do not lime me because I don’t sugar coat the pill that must be swallowed.”

“Plan to join when we live here permanently within next 1-2 years.”

“Working in Naples, Italy for US Navy.”

“When certain board members suggest that every lakeshore lot be photographed each year to monitor any changes made, I decided I did not want to belong to the POA anymore.”

“Would be very effective as I do not spend much time at lake place.”

“Do not spend much time at lake to be an effective member.”

“Haven’t received information.”

“Too old.”

“I was out of Wisconsin in Florida for a few years but returned in 2005. I have been to the cabin 4-6 summers now.”

13. Please list three things that you like most about the lake or the watershed surrounding the lake:

“Clarity; wildlife surrounding lake; stocking of fry walleye’s.”

“Water quality; beauty; kayaking.”

“Fishing; boating; jet skiing.”

“Pan fishing.”

“Fishing is so-so; good right kind of weeds.”

“Clarity and sandy bottom; relatively light boat traffic; wild undeveloped areas on river.”

“Access to other lakes; nice scenery.”

“Minimal boat/jet ski traffic; water clarity; care about water quality by owners.”

“Clarity; undeveloped.”

“Weeds; bottom; depth.”

“Clarity; not too much activity; sand shore.”

“Quiet; clear water; not many people around.”

“View and tranquility; wildlife; swimming and boating.”

“Looks nice.”

“Clean water; place to fish; scenic.”

“Amount of traffic during prime fishing times; water clarity.”

“Close/easy access through channel from Devils Lake; clear water; water temp.”

“Clean, clear water; limits on water skiing and PWC operating; less traffic on the lake than others I have used previously.”

“Clean, clear water; supports varied wildlife; recreational activities.”

“Small; variety of fish; woodland areas.”

“Quiet most of time; excellent water; fishing.”

“Being clean – Eau Claire – means clean water; good fishing – it’s not like it used to be; have lived here 46 years and awfully glad we moved here.”

“Seclusion; beauty; low population density.”

“The solitude; watching the wildlife; enjoying the beauty.”

“Clarity; good boating; good swimming.”

“Scenic beauty; using lake; clear water.”

“Sunsets; northern lights; peace and quiet.”

“Not too busy – it is relatively quiet; size; natural shoreline.”

“Size; water clarity.”

“Thanks to algae and weed growth plus a lot of shallow water areas, we have a quiet lake. Jet skis and power boats soon find out algae and weed growth is not friendly to them.”

“Water quality; size of lakes; jet ski/water skiing time restrictions.”

“Quiet; its size; its variety of wildlife habitats.”

“Clear and clean; relatively quiet lake; food fishing.”

“Clear water; quiet; wildlife.”

“Limited usage; clean water.”

“Quality of water – clean, sandy bottom; low density of development; beautiful trees.”

“Spring fed; water quality; conscious use of people.”

“Clear water; variety of shoreline, bays, smaller lakes; occasional serenity, quietness.”

“Clearness; sandy bottom and beach.”

“Water clarity; wildlife; connection to other lakes.”

“Clarity of water; not overdeveloped; not too much traffic on lake.”

“Can access five or six other lakes; clear water; decent fishing.”

“Quality, clear water lake; surrounded by wilderness; good location to other lakes.”

“Quiet not over used, not over developed; water quality; fishing.”

“The quiet (most of the time) worse now with the new nearby rock pit; water clarity, clean air, dark night sky; still a northwoods atmosphere.”

“Just viewing the lake and surrounding has a healing effect; love to watch the many different species of birds and wildlife; we are people watchers also – it’s fun to watch tubers, jet skis, kayaks, canoes – everyone.”

“Clear water; water level always stable; good wooded shoreline.”

“Clarity; easy access; sand bottom.”

“The spring water well water for drinking; the size of the lake – small; generally undeveloped natural vegetation around the lake.”

“View; beach; clarity.”

“Water clarity; accessibility; ice fishing.”

“Great swimming; general beauty; seeing people enjoying themselves.”

“Water quality; recreation; natural beauty.”

“The quiet during the week generally; the view of the lake from our deck; the mix of deciduous and evergreen trees surrounding our cabin.”

“Water quality; loan amount of water craft usage; sheer beauty of the lake.”

“Water clarity is good; development is not overdone (yet); PWC and water skiing time restriction provides time for others.”

“Offers variety of fishing.”

“Size; water quality; amount of use.”

“Privacy – no public boat landing; clarity/cleanliness; boat access to middle.”

“Reasonably clear; lovely view; quiet.”

“Leaving our yard in the wild; wildlife; ice cracking when it goes out in spring.”

“Loons and other wildlife; peace and quiet of off seasons.”

“Clear water; size; activity.”

“Beauty; water quality; sandy shores.”

“Clear water; responsible neighbors; access to Middle Eau Claire Lake; set hours for jet skiing and water skiing.”

“Relatively quiet during the weekdays; abundance of wildlife.”

“Clear water; minimal visible development around lakeshore; interesting lake contour – bays, undeveloped public island.”

“Small lake; quiet – clear; water levels stay up.”

“Beauty (every family member said this – but could be better if people planted trees instead of cutting). We saw one tree cut that blocked a TV dish!! Last Year!. Fishing.”

“Water quality; wilderness feel of the lake – loons/herons/eagles, etc.; variety of shoreline – a great mix of sandy shore/beach and vegetation (natural).”

“Clarity of the water; size of the lake.”

“Clear water; loons and other wildlife on and near lake; the time from September to May when the tourists and summer residents with jet skis are gone.”

“Slow amount of traffic; solitude.”

“Clean water; wildlife; larger lot requirements keep housing down.”

“Water clarity; site; usage.”

“Clarity; depth; level control.”

“Water quality; fish and wildlife; privacy.”

“There used to be clear water; fishing; variety of fish in the lake.”

“Clear clean water; attractive shoreline; quiet.”

“Clarity; flora and fauna; wildlife.”

“Clarity; the 10-5 ski and jet ski rule; size; wildlife.”

“In most cases, where one doesn’t see the homes from the lake; the quietness of the lake; the small amount of jet skis, skiing, and boating.”

“Water quality; sand bottom; home owners.”

“Clarity; politeness of other boaters; access to DNR islands.”

“Fairly clean water; good fishing; not overcrowded.”

“Quality of water; remoteness; not over used.”

“Access to other lakes; spring fed clear water; no boat landing.”

“Water clarity; fishing; depth and pretty stable level and springs.”

“Wildlife; quietness; enough vegetation to help lake.”

“Size of lake and different areas to do things. Ability to go into other lakes. Beautiful lake with good water quality.”

“Water clarity (so far, but it’s deteriorating); watersheds (environment, wildlife).”

“Clear water; clean lake; good ice.”

“Size; scenery; density of structure.”

“Natural plant life, wildlife and lake clarity; generally not overused, except holiday weekends; generally houses not excessive in number or nature; peaceful, quiet, yet good for recreation.”

“Quiet; beauty of the area; being up north.”

“Being on the lake (property owner); activity of others; the many animals and fowl that enjoy the lake.”

“Wildlife; fishing; peace and tranquility.”

“It’s clean’ it’s convenient; it’s beautiful.”

“Clear water; beauty of plant and wildlife; quiet and sound of the loons.”

“I drive 400 miles each way to find a quiet clean lake; not overcrowded on water or shoreline.”

“Water clarity; loons; islands.”

“Not crowded; ok fishing; access to other lakes.”

“Fishing; boating; swimming.”

“Size; quiet.”

“Clarity of water; sand beaches.”

“Small size; clarity of water; cold crisp water (spring fed).”

“Clean water; fishing is fair to good; like the Barnes area.”

“Property owners take good care of their land; clear water.”

“Nice summer weather at lake; no mosquito’s; peace and quiet area.”

“Clarity of water; size; fishing.”

“Clarity of water; cleanliness of water; natural beauty/sandy bottom.”

“Peacefulness when no boating (like near sunset); huge amount of wildlife in the spring; quiet times.”

“Great shorelines (sandy with no rocks or mud); clear water; controlled water level via outlet dam.”

“Size; the setback of building homes or cabins; the once clean water.”

“Not overcrowded; most properties are concealed by trees.”

“Peaceful – not highly used; small size – see wildlife.”

“Privacy due to small channel leading into it; size – small and intimate; size limits loud motors and bit motors.”

“Sandy shore; clear water; wildlife.”

“Clarity of lake; not overdeveloped; seclusion/privacy.”
“Clear water; sandy beach; peaceful for the most part.”
“Cleanliness of water; less busy – lower usage; natural beauty.”
“Sand; clear water; no bugs.”
“Beauty.”
“Clean water; lack of multi-family dwellings.”
“Water clarity still good; not overused; quality fishing of certain species.”
“Clarity; low usage; fishing.”
“Close; being able to go to more than one lake; quiet.”
“Clarity; not much traffic; quiet.”
“Wildlife observation and birds; beauty of the lake and surrounding area; lack of heavy use of personal noisy watercraft.”
“Wildlife; quiet lake (except the 4th of July); ability to get to other lakes.”
“Wildlife; tree mixture; quietness (when it is so).”
“Size; scenic beauty across lake; not too habitated.”
“Bass, crappie, bluegill fishing; wildlife; peace and quiet during the week.”
“Our location on the lake; clarity of the water; water fowl, loons, mallards.”
“Used to be a good fishing lake and didn’t need to be stocked at all.”
“Northwoods atmosphere; peace and quiet; clear water.”
“Quiet; little boat or jet ski traffic; clear, clean water.”
“Clarity; lack of a lot of high powered boats; low shoreline density.”
“Wildlife; clean lake; not very busy.”
“Relative lack of lakeshore line development – few lawns; water clarity; reasonable balance of usage and calm hours.”
“Relatively low use; relatively quiet uses of those on the lake; relative low density of housing on it and natural shoreline.”
“Clean water; few weeds; size of lake.”
“Water quality; relative quiet; surrounding beauty.”
“Clean, cool water with fish.”
“Clarity and depth of water; fishing and boating on large lake big enough to offer variety; nearby sold shoreline with limited public access; beauty.”
“Clear, clean water; warm summer weather; variety of options for use.”
“Quiet; wildlife; clean water in comparison to other lakes and rivers.”
“Size; clean; deep.”
“The restrictions on water skiing and water sports; the restrictions on jet skiing; cray fish.”
“Water clarity; relative use of lake; sand bar.”
“Clearness of water; appearance of shoreline; obscurity of houses.”
“Quiet; quaint; cute.”
“Clean water; not too many on lake; geese.”
“Water quality; quiet, no public boat landing; no trash – cans – glass.”
“Water clarity; limited watercraft usage.”
“Low boat traffic; natural bay shoreline on most of lake; good fish habitat.”
“Peaceful; beautiful; relaxing.”
“Boating; swimming; fishing.”
“Beauty; quiet; getting to other small areas via fishing boat.”
“Limited jet skiing/tubing hours; wildlife present; water clarity.”
“Natural lake fronts without cleared lawns; not excessively used – mostly locals; controlled jet skis by resort owners.”
“Wildlife; water quality (ten years ago); recreational possibilities.”
“Quiet; pretty; low population/development.”
“Not overly used/developed; good water quality; good – very good fishing.”
“No jet skis or water skiing in the morning or evening; eagles; loons.”
“Clear water; preservation of natural lakeshore vegetation.”
“Good size; clear water; lots of nature.”
“The environment, i.e. the beauty, solitude, clean air; clarity of the water; lakeshore not completely developed.”
“Scenery; swimming; wildlife.”
“Right amount of boat traffic; clean water; quiet.”
“It still has undeveloped frontage/wildlife/swamp areas; three resorts on said lake have well kept dwellings and shorelines; Cranberry Lake is relatively undeveloped and will remain so, I hope.”

“Clarity; size; recreational opportunities.”
“Wilderness; clean water; somewhat isolated from rest of the chain.”
“Size; water usually clear except late August bloom; variety of fish.”
“Water quality; privacy; serenity.”
“Quietness and peaceful; clarity; beauty.”
“Relatively quiet; good balance among the different uses; shorelines more natural – not too citified; mixture of dwellings modest and upscale – will not like to see it get more upscale.”
“Little boat traffic; water temperature; surrounding beauty.”
“The cleanliness of the water; the peace and the quiet; the beauty – wildness – lack of development.”
“Privacy; wildlife; wetlands.”
“Not overly used; clear water lake; was good pan fishing lake.”
“Usually a peaceful, tranquil area; surroundings are clean; lake is not overcrowded.”
“It still has a little northern atmosphere.”
“Most of the lake has natural shorelines; clear water; unique start of the Eau Claire River.”
“It is pristine and beautiful; it is still quiet in the evening; decent neighbor.”
“Clear water; good fishing; people.”
“Clean lake; not heavily populated; residents respect the condition of the lake.”
“High quality habitat (water and land) that enables birds and wildlife to thrive; peaceful setting during 3 season and at least some limitation during the summer on noisy activities such as jet skiing and water skiing; zoning regulations to prevent overdevelopment and overuse.”
“Wildlife; quiet; quality of water in lake.”
“Somewhat private; overall fish numbers; water clarity.”
“Color and clarity of water; sense of activity surrounding the area.”
“Clean water – shallow around shore; sand bottom; wildlife – loons/Eagles/cranes/ fishing.”
“Size of lake; presently not over populated.”
“Clearness of the water; islands; lack of boat traffic.”
“Fishing; hunting.”
“Scenic beauty; clear water, sandy bottom; wild areas.”
“Clarity; sand beaches – good boat landing; most residents keep shoreline natural.”
“Nice place to get together with family and friends; large enough for recreational purposes; overall friendliness of people.”
“Seeing people enjoy it, boating, swimming, children laughing, etc.; swim after a sauna; meeting non-angry neighbors.”
“Still the clarity; sand bottom; scenery.”
“Scenery; relatively pristine environment; relatively low boat traffic.”
“Clarity of water; variety of depth of water; natural shoreline.”
“Relative quiet; beauty.”
“Low density, quiet, cabin setback, clean.”
“We have a cabin there; we love to boat; we love to fish.”
“Clear water; sand beach; lands open to public use.”
“Sandy bottom for swimming; ability to go to another lake; all around beauty of surrounding area.”
“Clear water; quiet most of the time; good swimming.”
“Fishing; lots of summertime activity boats – jet skis, etc.; lots of wintertime activity ice fishing – snowmobiles, etc.”
“Not much boat activity or jet skis.”
“Clear, clean water; quietness, calm, beautiful view; natural environment, shoreline and bays, woods.”
“Clear fresh water from river was nice for flow; sand beach on east end nice for swimming; size of lake.”
“Quiet; clean and clear; size.”
“Water clarity; sand bottom; size.”
“Water clarity; sand bottom; tree variety.”
“Water clarity; species of fish available; lake is not over populated.”
“Size; beauty and loons; memories.”
“Somewhat clean; decent fishing; wildlife.”
“Lake not over used; clear water; scenery.”
“Quiet; good neighbors; fishing.”
“Beautiful water; quiet and peaceful (mostly); sandy bottom.”
“Clear water; great amount of undeveloped land adjacent to the lake.”
“Clear water except summer 06; blue gill fishing; recreation.”
“Clarity; fishing.”

“Clarity and cleanliness of our lake; sand bottom for great swimming; large enough for recreation.”
“Clear water quality; sandy; good fishing.”
“Beauty; water clarity; fishing.”
“Clean, quiet, nice concerned property owners; beautiful trees; bald eagles, smells clean.”
“Clean water; good fishing; great for water sports.”
“Water clarity; quiet when no jet skis; shoreline development has left natural trees, not too cleared out.”
“Water quality; wildlife; northwoods setting.”
“The quietness of the lake; loons; good for swimming.”
“The quiet – we are disturbed when there is unnecessary noise.”
“Fairly natural look of shoreline (trees, lack of formal landscaping, minimal sized openings); water clarity; sandy bottom.”
“Clear water; sandy bottom; little traffic.”
“Lakes have been known for clear, excellent water quality; fair to good walleye and small mouth fishing; moderate too low level of use during weekday.”
“The clear water in the lake; relatively sparse development around the lake; the remote location.”
“Beautiful water; beautiful scenery; peace and quiet.”
“Clear water; not heavily used.”
“It’s beautiful; it’s quiet except for the jackasses on jet skis; the loons and other wildlife.”
“Fishing is good; wildlife; water clarity.”
“Clear water; good fishing summer and winter; good public access.”
“Clear water’ not real deep on bay; close to Lake Superior.”
“Clarity; sandy bottom; reasonable traffic.”
“Wildlife; quietness; openness, but small.”
“Pretty quiet; not over developed; clean.”
“Water clear; we get small fish.”
“Distance to the lake; water clarity.”
“Clear water, healthy lake; pretty good balance between fishing, kayaking vs. water ski jet skis; trees and rolling land on whole shoreline vs. visible houses and over development.”
“Clean; big fish; sun and moon reflection on lake.”
“Not overcrowded; clarity of water; fishing.”
“Not overbuilt; not overused; quiet.”
“The lake water; the friends on the lake; the river.”
“Clarity of water; wildlife; beauty and peacefulness.”
“Clarity; amount of use.”
“Wildlife – baby loons first in 20 years; coal water; the quietness till 2 years ago when jet skis came.”
“Clear water; wildlife; quiet most of the time.”
“Water quality; peacefulness most of the time; wildlife.”
“Clear water; not overpopulated; no public landing (channel only).”
“Spring fed lake; no public access; size.”
“Lot of forested land, still no large development of homes or condo’s; clear water, minimal amount of personal watercraft and boats; size of lake.”
“Quiet most of the year; area people; interest of the property owners to improve the area.”
“Clarity; sandy bottom; size for water activity.”
“Know the lake; close to cabin; cribs in the lake.”
“Quiet; clean.”
“The presence of wildlife; a place to boat; a place to swim.”
“Good water.”
“Clean water; swimming; heavily wooded.”
“Low boat traffic; clean; min. size.”
“Water usually clear; quiet; wildlife – loons, eagles and other birds, deer, bear, fox; woodsiness – forest floor, privacy; size of lake frontage lots.”
“Clear water; lake activity in high only a few weekends per year; low density of lakeshore.”
“Clean water – it is still like it was 45 years ago; the dam on Middle still impresses new people; most people are still friendly.”
“Clarity of the water; not heavily used; large areas of open land around the lake.”
“Quietness; calm water.”
“Clean; quiet; lots of wildlife.”
“Clarity of the water; the amount of people on it during the week; no matter how windy, the ability to find a quiet place to fish on it.”

"Water clarity; low fishing pressure after Labor Day; trophy muskie potential."
 "Swimming; fishing; quietness and wildlife."
 "It is clear, sand bottom; the wildlife in and around the lake; good fishing."
 "Enjoy the water; looking at the cabins; enjoying the wildlife."
 "Wildlife; beauty; nature."
 "Location."
 "It has been home; the water is cold; the fish do not stink when you catch one."
 "Natural beauty; wildlife – loons, eagles, ducks, etc. herons, etc.; quiet and solitude of area."
 "Seclusion; quiet; unspoiled (so far)."
 "The beauty of the lake and the shoreline; the lack of commercialization; the wildlife."
 "Beautiful lake; great swimming; time limits on jet skis/tubes/skis."
 "Clean water."
 "Loons; access to other lakes."
 "Clear water; quiet lake; beautiful area."
 "Scenery – view; water quality; general area."
 "Quiet and peaceful; wildlife – birds and fish; not overly developed – no condo's."
 "Size with ability to boat to bigger lakes; wildlife; quiet."
 "Relative quiet; clean water; forest and wildlife."
 "Clarity; no weeds/few weeds; not a lot of activity/noise."
 "Quiet lake; variety of fish; good size."
 "Quiet, size."
 "Clarity of lake; people use on lake; looks of lake."
 "Open shoreline areas; great water fowl; not overcrowded."
 "Vegetation for fish; good bass fishing; good wildlife habitat."
 "Clear water (past tense); trees/environment generally; quiet (also past tense)."
 "View, serenity, natural setting, place to relax; number of people in the area – not too many; ability to go by boat to different lakes."
 "Clear water; good fishing; lots of wildlife."
 "General level of lake activity; clear water generally; up north feel about the lake – loons, nature."
 "Quiet; remote; wildlife friendly."
 "Variety of water activities; wildlife; solitude."
 "Clear and clean; not too much traffic; access to smaller lakes."
 "Clarity of the lake; multi-use of lake – fishing in the morning and evening; water skiing in the afternoon; wildlife around the lake and area."
 "Natural beauty; wildlife; clarity of water."
 "Scenery; peacefulness."
 "Amount of undeveloped shoreline; quality and variety of wildlife; even on the busiest holiday weekends the lake never seems crowded."
 "Clear water for swimming; forested shoreline – much of the lake at least; fishing."
 "It is a quiet lake; most homeowners have the shoreline in its natural state; since it is a poor lake for jet skis, snowmobiling, etc., it is quite private."
 "See lots of wildlife; low usage in off seasons; lots of wild land around lake."
 "Spring fed; clear."
 "150 feet of frontage minimum requirement; wilderness look of most properties – no lawns; loons and other wildlife."
 "Clean; not crowded."
 "Lake clarity; seclusion; size."
 "Clear water; light recreational use; canoe access to Eau Claire River/Middle Eau Claire."
 "Part of chain; water clarity; depth."
 "Clearness of it (was better); was good fishing; smaller size – spring fed lake."
 "The view, peace, tranquility; wildlife; the quiet."
 "Quiet; lake beauty and clarity; woods."
 "Clear water; size of lake; not too heavily used."
 "Size; clarity; wildlife."
 "Clarity; cleanliness; water level remains within 6 inches."
 "Clean; great shoreline; great trees."
 "Large growth timber on the lake; up until the past few years, the clarity of the water; except for holiday weekends, moderate activity on the lake."

“The island provides water access only for swimming and fishing; the size allows enough room for fishing and skiing; the residents are good land and water stewards.”

“Clear lake; quiet; swimming – boating.”

“It’s not too crowded and did like it to remain that way; it’s quiet, clean, wildlife, beautiful.”

“Privacy most of the time; fish available; other wildlife seen.”

“Sand bottom, clarity; the few resorts left are fun.”

“Quiet; spring fed; fishing.”

“Beauty of the environment.”

“Fishing; swimming.”

“Wildlife and preserved natural condition of lake; clear water; under-populated with a great deal of natural vegetation.”

“Small and quiet; quiet; isolated.”

“Water clarity; relative quiet; DNR islands; no public access.”

“Clarity – upper; beautiful views some wild areas (not developed); rurality.”

“Water quality; remaining and preserved expanses of wooded, natural shoreline; relative peace and quiet for wildlife habitat and viewing.”

“Not densely populated with houses; many days there is not a lot of boat traffic.”

“Lower level of population pressure on area; scenery and wildlife; privacy.”

“Clean water for swimming; large enough to fish or ski.”

“Sandy beaches; clear water; size.”

“Water clarity; low recreational boating (PWC, power boats); island.”

“Water quality; loons; not too overly populated.”

“Water quality; loons.”

“Wildlife; water activities.”

“Clarity of the water; the dam and locks above Lower Eau Claire; fishing.”

“Lake lot size limits overcrowding; boating and wildlife observation; friendly people who use the lake.”

“Restrictions on jet skiing, keeping early teen riders who don’t know the rules of the road or lake a limited amount of time on the lake.”

“Sand bottom; water clarity; safe for children and grandchildren – no steep drop off near us.”

“Clarity of water; individual management of local property owners; moderate boat activity.”

“Wildlife, loons, eagles, blue heron, deer; fishing; beauty and country atmosphere; clarity of lake when we moved there.”

“The preservation of north shore atmosphere; setback from shoreline of building sites; effort to prevent introduction of exotic species.”

“Size/shape; depth; clean.”

“Clarity; wildlife; quiet.”

“Clear water; sand bottom; tree lined shore (big trees surrounding lake).”

“Clean; clear; good swimming.”

“Natural areas of shoreline and wildlife; clear water.”

“Water clarity; quietness; trees and wildlife.”

“Peace and quiet – no motor use (sailing, canoe, kayak, swim); wildlife; water quality.”

“Water clarity.”

“Water clarity.”

“The quiet.”

“Beautiful clear water; healthy fish and wildlife; quiet and not overcrowded.”

“Sand bottom; foliage; water clarity.”

“Sand bottom; clarity of the water; the quietness.”

“Chain of lakes that it connects to; sandy beaches/bottom; clarity.”

“Scenery; wildlife.”

“Beauty of the shoreline; rivers and bays connected to Middle Lake.”

“Natural beauty and tranquility.”

“Chain of lakes; clarity; sandy beaches/bottoms on most of the lakes.”

“View; usually fairly quiet; depth of lake.”

“The size; the quality of clarity; are my memories of times past before all these people come here.”

“Size; quiet.”

“Clarity of water until this year; setback of lake property (dwellings); beauty of the lake.”

“The clearness of the water; multiple use, i.e. fishing and water skiing.”

“Natural beauty and serenity; wildlife; relatively few jet skis/loud motors.”

“Privacy; clarity of water; sparse population.”

"It's a great lake; great fishing; clean water; love it and miss it."

"Water clarity; still plenty of natural shoreline undeveloped; sound of the loons on the lake when undisturbed."

"The normal overall tranquil beauty; comparably clean, clear water (please try to preserve)."

"The beautiful natural environment; the isolation and quiet; friendly, good neighbors."

"Lack of clear cut lakeshore; low boat traffic; clear lake."

"Nature environment; beautiful setting/views; congenial neighbors."

"Clear; quiet; nicely developed."

"No public boat landing – lake too small; clean water; good fishing with little motor."

"I used to love how clear the water was – ever since I was 2 (now 56); I used to love the call of the loons and to see bald eagles next on our land; the marsh around our property used to be full of herons and birds."

"Clear water; quiet on the lake early morning and at night; scenery."

14. Please list three things you don't like about the lake or the watersheds surrounding the lake:

"Noise of jet skis; water skiing after 5:00 p.m.; slow control of red cray fish."

"Concern about overbuilding; concern about algae growth; large boat traffic."

"Slight increase in activity and jet skis; people violating quiet hours; people fishing within 30 feet of our deck."

"The water is getting cloudier every year."

"People with lawns right to lake shore; large hp boats and ski boats; jet skis."

"Noise and lights from bars on lake."

"Declining water quality; declining fishing; oversize boats and jet skis."

"PUD's; size of lake and density of homes; limited hours for waterskiing."

"More algae; use by jet skis; becoming more developed."

"Sand bars; handicap fishing dock in bad place."

"Too many cray fish; not enough fish; shortage of weeds for fish."

"Noise from jet skis; lousy fishing."

"Boaters do not respect rules regarding wake near shoreline causing unnecessary erosion; jet skiers; people litter, cans, cigarette butts, wrappers; plastic, etc."

"Like all."

"Too many people; taxes too high."

"Spearing."

"Jet skis; sport boats."

"A few cabins/homes are built too close to the water; I am unhappy that the water skiing/PWC hours were changed from 5:00 p.m. to 6:00 p.m."

"Increased pressure from boating; mucky bottoms on our beach."

"Too crowded; too many boaters/water skiers for this little lake; too large hp motors on 75% of most boats and too large of pontoons."

"Jet skis; water skiers rude behavior – after hours skiing; loss of vegetation due to rusty cray fish."

"People doing as they please – if they are fined they still get to keep what they have done; people near the access using it as a driveway or a parking area; many people do not know the access is there to be used."

"Too much non-resident use; too much building."

"Jet skis (Birch Lake with its island middle is too small for the jet skis); the depth or lack of it; the mud or silt bottom is too deep."

"Can't swim in the lake."

"None."

"Increased floating vegetation; some years algae bloom; development."

"Jet skis; water skiers; mud."

"Increased algae."

"Amount of algae on west end of lake; the shallowness of lake on west end."

"Lack of paved roads in Town of Gordon; lack of Highway Y condition."

"People who insist on having green lawns to the lake edge. People who cut down trees on steep lake frontage and then watch the frontage erode into the lake."

"Rusty cray fish infestation; lack of panfish; channel between middle and Bony is being overtaken by cattails. They were not present at all 10 years ago and prior."

"Increasing development pressure."

"The 10-5 ordinance that is not enforced; growing problem with weeds that float up on beach; swimmer's itch."

"Jet skis."

"Weed growth (lily)."

“Noisy jet skis/ATV’s in the area; fear of over-development (we know of a condo dev. in the area on the lake).”

“Jet skis; rafts; loud people.”

“Noise – unnecessary yelling, loud music; jet skiers disobeying distances from docks, harassing loons. They should be banned or limited to the large open area of the lake.”

“Bug hatches; ice pushing shore toward our cabin.; ice pushing trees inward to our property.”

“Jet skis are annoying and disruptive to wildlife and serenity; people who take their bath in the lake, adding nutrient via soap and shampoo; inconsiderate power boaters who fail to keep their distance from docks and other boats.”

“Starting to see too many jet skis; too many people on lake on weekends; winter water level too high and creates spring shore damage.”

“Have not lived up at the lake yet.”

Water quality seems to be getting worse; low numbers of pan fish; too many cray fish.”

“Getting more and more annoying night lights and no one does anything about it so what good is zoning ordinance? Bony is part the tipping point in housing allowed on the lake.”

“Jet skis and jet boats.”

“Congestion at river mouth; too many boats park all day and drink beer and bother neighbors; sewage entering lake around Buck and Bass.”

“Noise level of Highway 27; noise level of boats/jet ski activity; three condo developments activity on our small lake.”

“Restriction of use by the family to use lake for rec activities; time restriction on water skiing, tubing, etc., but no restrictions by fishermen.”

“No public swimming area available.”

“Nothing.”

“Angry, narrow minded people telling me how I can use the lake.”

“Overcrowded trailer resorts; building boat houses too close to lake; jet skis on the weekends.”

“Basically nothing important; any overdevelopment in the future.”

“Lack of vegetation buffers in many areas = greater threat cultural eutrophication; rude/inexperienced boaters.”

“Big boats tear up lake and weed beds.”

“Limited water skiing hours set by local ordinances; quality of fishing.”

“The condo’s coming in; people who use fertilizers; people who cut weeds/no shoreland buffer.”

“Occasional noise of PWC and other boats; too old in June Ctry to fix that. Nothing else.”

“Jet ski and water ski hours are to long; need water craft speed limit.”

“Allowing spear fishing by local tribes.”

“Only 190 acres; condo’s being built.”

“Campgrounds; resorts; personal watercraft – very disturbing.”

“Lack of mature forests on some of lakeshore – damaged forests.”

“Condo’s going in to many for small lake.”

“Lawns within 300 feet of lake; rip-rap shore; fast high power boats (Lake Superior Boats); personal water craft.”

“Jet skiers that don’t follow the 10-5 ordinance; water skiers that don’t follow the 10-5 ordinance; the presence of harmful cray fish.”

“The numerous and noisy jet skis = noise pollution; motor boats with high horsepower = shoreline erosion; lack of a toilet at public access – some boaters come ashore to relieve themselves on private property.”

“Shallow; vegetation; much.”

“PUD being developed; outhouse at Howling Wolf Resort (at lake shore); road which is at Howling Wolf Resort going down to the lake and the runoff it causes during storms.”

“Watercraft (jet skis) – lake is too small.”

“Too many weeds close to us.”

“Campgrounds with multiple docks; boaters and water skiers who don’t observe safety rules a dn hours; littering – especially those smokers who throw cigarettes in lake.”

“Too much boat traffic; jet skis; the fishing has declined.”

“Jet ski; boats too fast; crows and seagulls.”

“Ducks; rusty cray fish.”

“Congestion on holidays; resort noise; amount of fish taken with handicapped children.”

“The over building of large homes; the scum on the lake bottom and on the rocks; the overcrowding at the campground.”

“Time restrictions for jet skis, tubing, water skiing, fun; fisherman that are pigs and don’t live on the lake; Barnes/Eau Claire Lakes Association members.”

“People not cleaning off boats; could clean up after themselves.”

“Few more weeds than I like; weeds blow in.”

“Fishing is very difficult due to clarity of water.”

“Boats and motors are too big for size of lake; approval of condo’s on such a small lake’ annoyance of jet skis.”
“Smell or rubbish being burned by some on the lake; lack of concern for safety by some residents.”
“Too much noise from jet skis and snowmobiles; ATV’s tearing up the road; lack of consideration by skiers and PWC riders for fisherpersons.”
“Too much jet skiing, etc. and overuse of the island; no apparent enforcement of ordinances; not enough respect for quiet sports.”
“Cray fish; jet skis; crowded.”
“Overfished; poor enforcement of jet ski hours.”
“Loss of weed growth due to crabs – thus loss of fishing quality; algae blooms; excessive fireworks this year – disturbed peace of lake and trash found in lake several days; people using jet skis to pull tubes (no 3rd person).”
“Jet skiing persons who take over the lake; tubers; persons who use the lake to litter.”
“No resorts to boat to.”
“Not swimmable; fireworks; high speed boat traffic wildlife (loons, etc.) are around.”
“I like everything about the lake.”
“Beauty partially destroyed by winds of 1999; less birds now.”
“What owners have done to the shoreline.”
“More and more jet skis; cray fish; condominiums are coming to town – very bad.”
“Too much muck.”
“Too many visitors; we stay near boat landing; personal water crafts; rusty craw fish.”
“Channel into upper Eau Claire difficult to maneuver. Need to enforce skiing and tubing hours.”
“Sand bar at mouth of river; dock at campgrounds.”
“Increased jet ski use on such a small lake.”
“Taxes.”
“Bottom mucky – can’t swim; too hard to get pontoon under bridge to upper.”
“Algae clumps floating on surface; weedy areas getting thicker; boaters coming too close to fishing boat and boaters not obeying no-wake rule.”
“To many boaters creating large wakes close to shore; weeds and algae bloom that lasts too long; large marina on the other end of the lake with all of those trailer, RV’s (overdeveloped).”
“Restrictions against hours of skiing; allowing the trapping of cray fish; lake is now invested with weeds; they turn to sediment of mud.”
“Too many power boats; too much noise; too many sea jets; too many people fishing or using the lake.”
“Jet ski noise; bright lights from properties across the lake; buck and bass is a blight to the lake.”
“Too much sediment at bottom of lake; too shallow.”
“Rapidly encroaching Indian grass/weeds on southwest and too warm leading to Indian grass.”
“Swimmer’s itch; algae.”
“Jet skiing.”
“Swimmer’s itch.”
“Water clarity and weeds are worse; fishing could be better.”
“Poor fishing; water ski hours; poor fishing.”
“Jet skis; poor fishing.”
“Quality of walleye fishing down.”
“Low water level; 8-10” lower over the past five years because board was removed at Moony Dam.”
“Jet skis.”
“High taxes on non-residents; lack of adequate restaurant facilities in the area.”
“Water jets on the small lake.”
“Fishing has greatly worsened in last 18 years; loudness of jet skis; public dumbness.”
“Excessive water plant growth, requiring one to have to cut through plants to access center of lake; public dock access is difficult to maneuver; water clarity.”
“Jet skiing; water skiing; the lack of frogs.”
“No enforcement of Town ordinances (lights on shores, jet ski, water ski after hours, burning when not supposed to); over-abundance of Canada geese on lake.”
“Campground and related activity at north end of lake; Indians spearing in spring.”
“The amount of boat traffic.”
“Increased development; clearing of shoreline; perceived decline in water quality.”
“Increase in jet skis; lake rules not enforced; fireworks.”
“Fragmentation of forest lands surrounding lakes; traditional paper company owners selling small parcels; jet skiing; shoreline development impacts water quality.”
“We purchased our property last year and plan to hire a landscape service to restore the vegetative buffer to our shoreline where it is missing as well as plant native tree species on our property.”

“The public access; non-property owners causing problems on the water.”

“Some boaters ignorance of wake laws near shorelines; Indians spearing rights/fishing tournaments; lack of upkeep at the lock and dam.”

“Increasing use of motorized watercraft especially apparent disregard of building too close to shore; lack of boat courtesy, often by non-fisherman racing by or running very close.”

“Non-performance of DNR relative to Fusty cray fish; use restrictions on jet ski and water ski while no fishing boats are even on the lake; burning restriction to one evening per weekend for weekend residents.”

“Urbanized landscaping; multiple public landings; lack of compliance with lake regulations.”

“Limited access to Eau Claire lake chain; new public landing – made too high.”

“Jet skis; boats near shore; too many buildings seen at shoreline.”

“Can’t come up with a thing.”

“Channel from Middle Lake now too shallow; loss of vegetation from rusty cray fish; too many people mow to edge and pump water out for lawns.”

“Noise; traffic; ski jets and ski boats.”

“Lack of quality fishing; lack of vegetation on northern end due to crayfish.”

“Increasing emergent vegetation (fertilizers); septic systems (too many); questionable operating procedures for Mooney Dam which controls lake levels.”

“Properties are being over valued by realty companies; lake area is being over sold and developed; taxes on older frontage properties have increased 20-fold.”

“Recent extended jet ski/tube hours; crayfish affecting fish habitat; taxes – property.”

“Grandfathered boat houses; size of standard fish caught; no help to improve shore erosion.”

“The overuse by weekend campers/RV/trailer/resort types; lack of respect by boaters/watercraft operations for private property; the obvious decline in water clarity/cleanliness.”

“Jet skis; fast boaters; algae bloom from stupid people who fertilize lawns.”

“Panfish numbers seem to be down some.”

“Too many jet skis; too many fireworks; too many 4-wheelers.”

“Jet skis.”

“Increasing activity (use) of the lake (many are non-property owners); increasing shoreline development and limited ordinance restrictions; newer homes are very large and expensive adversely affecting taxes.”

“Too may seagulls; fair fishing at best; property taxes too high for the services we receive.”

“Unrestricted growth of trailer parks (crowding entrance to Eau Claire River with docking/septic systems); erosion caused by excavation of building sites; poor enforcement of zoning/building codes.”

“Diminishing quality (more algae/bottom muck/weed growth); lack of respect (resident without buffers/jet skis/litter); traffic.”

“Starting to see many extended docks, pontoon boats and floating rafts.”

“Jet skiers; boats moored where river enters lake; rusty crayfish infestation.”

“Crayfish.”

“Increase of big boat owners creating wakes that erode the shoreline; what’s with the water level? Is it my imagination or is the lake several inches lower than 6 to 8 years ago? Growth of weeds in places they weren’t 10 years ago.”

“I do not like developers trying to add ample development to our community.”

“The inappropriate care of the water front (clear cutting and erosion); the growing noise and light pollution (jet skis, etc.); rising cost of taxes and the lowering quality of life.”

“Rapid eutrication (accelerated); decreased water level; invasive grasses.”

“Reduction in weed beds.”

“Fishing seems to be slowing down; at times, there is too much sporting activities (skiing – water sports); not enough conservation on shorelines.”

“Too much building (new development); not too much services for taxes spent; no lake laws enforced (jet skiing).”

“No speed limit; jet skis.”

“Nothing.”

“Sediment seems thicker this year.”

“Nothing to say.”

“The lengthy, long hours jet skiing and water skiing is permitted; zoning regulation loop holes that permit overdevelopment; inadequate protection of shoreline wetlands.”

“Jet ski traffic; ATV traffic.”

“Fishing is poor.”

“Not enough fish being stocked; too many cray fish eating weed habitat.”

“Nothing to dislike.”

“Decrease of weed beds; harder to find and catch fish; we have a Spring Ice Show problem.”

“Too shallow; murky bottom.”

“Summer – all the people.”

“Noisy bars and campgrounds; cannot bike – trails ruined by ATV’s erosion.”

“The old boat landing on Lake Road should be made into a user friendly beach. People (we included) use it to swim and parking and safety are an issue (speed limit should be slowed down at that spot due to people in vicinity – parking).”

“Jet skiers; snowmobilers/ATV’s in winter; pollution/runoff too much cleared shoreline.”

“The cray fish – which are getting better.”

“We pay huge out of state property taxes and get little benefit from the town.”

“High traffic, mud or weed bottom, silt.”

“It’s so murky we’re to go boating; neighbors have lost water pumps and lower units because of murky bottom.”

“Destruction of fishery by rustican cray fish, especially panfish; poor bluegill fishing – bag limit should be 15 or less; loud, obnoxious late night noise and music from Buck and Bass Resort.”

“No weed beds; poor fishing; high taxes.”

“Who doesn’t like a lake?”

“High density development; oversized speed boats on a small lake; light pollution.”

“Better boat landing and place to get on ice fishing.”

“Fishing is poor; water clarity is bad – green soupy – smelly; boats and pontoons using east end to swim and leaving messes.”

“Noise from the gravel/asphalt plant that just started.”

“No weed shelter.”

“Trailer and camper concentration at resorts; freedom from property taxes of the above, although stationery; lack of restaurants.”

“Property catching areas (shallow); shoreline erosion; no public campground.”

“Debris from other homeowners thrown in lake; debris always seems to end up on our beach front.”

“PSC hours are too long/not enforced; not aggressive enough to curve/eliminate non-native species; fishing habitat is not being replaced/maintained (cray fish).”

“PWC noise, personal water craft; not very good fishing.”

“Lack of crappies; mud bottom.”

“Some of the people’s disregard; too much new building; garbage in lake; jet skis.”

“The campground at Drags, don’t feel the sewage is taken care of as it should be; the campground at the dam; the junk the ice fishermen leave on the ice, wood, glass.”

“April walleye spearing; limited fish stocking; increased taxes.”

“Buck/Bass and Boultrer Lodge noise; too many lawns at the water’s edge; too much fertilizer, lawn clippings.”

“Fishing is not good; crawdad’s; Bony Creek between Bony and Middle Eau Claire seems to be filling in for the past 4 years.”

“Channel from Bony to Middle too shallow and narrow; weeds are starting to get worse; more traffic on lake.”

“Fishing.”

“Resorts – Howling Wolf, guests do not respect the rules; PUD over development; Swan project on Bony Lake; the Swan developer as property owners.”

“Walleye limit too small; Indian spearing; sometimes rules on skiing and jet skis aren’t enforced.”

“Jet skis; noise from Buck and Bass (and other resorts); a few cabins that clear cut their shoreline.”

“None.”

“Jet skiing; speed boats; trailers that are moving in.”

“Fireworks; the long hours allotted for water skiing or even jet skis.”

“I can’t catch my walleyes. Of course that could be my problem. I’m not a fan of jet skis. Public access on Lower Eau Claire needs to be improved (dock quality, trim trees on launch).”

“Too far from home.”

“Water quality has declined readily and steadily in past 7 years; too many cabins and houses with no or little vegetation buffer; filamentous algae that is unsightly and increases sediment as it dies.”

“Lack of good fishing on the lake; the high deer population prevents native vegetation from regenerating; no really good dining establishment nearby.”

“The large campground; illegal septic systems still in use; development that has been allowed on the river.”

“Large abundance of floating weeds covering shoreline; Buck and Bass Resort.”

“Jet skis and any craft that makes a wake; overcrowding and overuse; greedy people trying to make a financial killing while killing off the environment – 4 dishonest politics and rules and regulations resulting in the loss of a road and the sale of the public access.”

“No vegetative barrier; using fertilizer on yards with no barrier; jet ski.”

“No public swimming area; new boat ramp can only handle one boat at a time.”

“Not enough boat landing space – should have more; times for water skiing – it is rough, windy times.”

“No complaints.”

"The muddy bottoms; shallow channels between Birch to Upper; in the last four years, the muddyness and lily pads in front of cabin."

"Building condo's on lake."

"No fish."

"Rusty cray fish destroying habitat; jet skis, motor boats, water skiers; docks, boat lifts, multiple parked boats, floats, etc."

"Potential for overcrowding; diminished walleye population."

"Noise from new quarry off 27, south of Pease."

"None."

"Jet ski use; ATV's; people throwing litter in the lake – especially glass bottles."

"Cray fish."

"Jet skis on this small lake – they roar back and forth for hours; no walleye stocking."

"Over development; jet skis; 65 mph boats."

"None."

"Don't care for so many boat houses; the few places with clear wide open yards to water."

"The new high density development going up; loss of fish spawning grounds around Bony Lake; large and noisy I/O boats on this small lake."

"Lack of enforcement of boat houses, sheds, kept away from lakeshore; permit to build condo's on Bony Lake; allowing access to south end of lake through wetlands and putting 3 piers on the lake for sale of lots."

"Winter fishermen who I believe are fishing out the lake; over building on some lots; illegal building on the shoreline."

"No public beach."

"Don't get to use it as I'm a seasonal resident (currently); need a launch off the Pease Road."

"Fishing is not as good; they are building condo's."

"Weeds; oil from boats and motors; dead trees, etc. not being removed."

"Jet skis; people who have bright lights on all night."

"Jet skiing; location of boat landing; cray fish."

"6 p.m. curfew for speed boats and jet skis; RV parks that generate people/boats on the lake; more pan fish/crappies in lake for children; dray fish in the lake; locks at the dams primitive."

"More development especially west end near Devil's Lake."

"All the new rules, they think people have no common sense; all or most of the resorts have gone away and the new and young people have nowhere to go; taxes – why don't they work harder on that – soon only the rich will have property."

"Too shallow in places."

"Loud jet skis; fishing conditions have worsened; cannot get boats from river out onto big lake."

"Jet skis; jet boats; more people."

"Too many people on it on weekends; the two mobile home parks; all the docks by the entrance to the river going to Middle Eau Claire."

"Jet skiers/water skiers/high horsepower motors; rusty crayfish effect on weed beds; threat of high density housing."

"Jet skis and jet boats; the water is very cloudy now due to bottom being destroyed by jet boats; wildlife being chased by jet craft."

"All the constraints on upgrading the beach area; jet skis; not closer to my home in Chicago."

"The unfriendly lake property owners associates chasing people down, stopping people and trying to force their opinions of what others should do. This is America. They have no right. They also trespass on other property."

"Wish we had it all to ourselves."

"Too many people with too much money moving in; average people can no longer afford to buy property; taxes are far to high for services provided."

"The lake needs to be restocked with walleyes and crappies."

"Poor fishing; abuse by people of natural resources, i.e. pollution; growth of weeds, algae – cray fish infestation."

"The advent of resort style construction; loud boat racing; some overly manicured lawns."

"Jet skis."

"Rusty cray fish; decreased fish/panfish population; more crowded over time."

"Weeds – thick; algae floor muddy."

"Shallow channel; lack of panfish; limited boat access."

"Fishing is poor."

"Jet skis on our small lake – noisy, wakes, threaten birds; noisy neighbors who play loud music; too many fireworks late at night before and after July 4."

"Nothing."

"Jet skis and high powered boats; ATV's."

"Does seem to be getting cloudy; less abundance of fish."

“Becoming cloudy; less fish.”

“High taxes.”

“Ski hours are too short in the evening; allowing 300 – 500 foot docks to extend over the wetland area – poor conservation; drastic decrease in successful fishing.”

“Jet ski use; speed boat use; mud in lake.”

“Extended hours for jet skis and water skiers; too liberal zoning rules and lack of enforcement of these that do exist; no vision (and no plan) for water treatment facility.”

“Birch Lake is a little too shallow at times; bridge between Birch and Upper Eau Claire is difficult to traverse (too shallow); some shallow places should be marked on Upper.”

“Water skiing; jet skis.”

“Changing water conditions of the lake’ continuing elimination of regulation by cray fish; cray fish and potential for milfoil, increased spread of noxious plants.”

“Invasive, non-native cray fish; poor fishing; water becoming siltier.”

“Increased development; poorer fishing; people who play loud music.”

“Fishing could be better; wild variations in water depth.”

“The algae blooming.”

“Do not like jet skis.”

“Deteriorating water quality.”

“Condominium campers with huge boats >100 or 150 hp; manicured shorelines on the stretch between Mooney Bay and the lake; jet skis.”

“It is mostly shallow; not suitable for swimming.”

“Increase in weed growth; poor fishing; lake property tax increases.”

“Jet ski/water ski hours preferred 10-5; rusty crabs and their effect on weeds; dock construction across wetlands.”

“Noticed more trash in lake, i.e. bottles, cans.”

“ATV usage/noise; PWC usage/noise; shallow channels.”

“Amount of water vegetation; lack of decent size panfish now; boat landing.”

“We like the lake – it’s the channel between Bony and Middle that is becoming messed up.”

“Nothing.”

“Garbage left in lake; noisy boats – those with loud motors.”

“Can’t jet ski after 5:00 p.m.”

“Restricted water skiing and jet skiing availability; don’t like requirement of grass area along the lakefront. Too much watershed.”

“Large water ski boats; jet ski; snowmobiles.”

“More home than past; loss of panfish.”

“The campgrounds on the lake; too many geese.”

“Thick weeds; muck.”

“Have no complaints.”

“I’m losing my shoreline and trees due to erosion – ice build up in the spring.”

“Low shallow bridge on upper; give tax incentives for resorts on lake so we can boat to food.”

“August algae; jet skis.”

“Jet skis; race boats.”

“Growth of milfoil and vegetation.”

“Campgrounds; restriction on my use of wake in favor of fishing; 10-6 use of skiing, etc; favoritism toward fishing with spot light on minority.”

“Concern about boats (speed) and jet skis coming in.”

“Too shallow.”

“Concerned about too much development causing overuse – pollution crowdedness.”

“Increased development – especially high density PUD approval; increased jet ski use and large boats (wakes that are damaging); increased noise from ATV traffic (weed beds and floating weeds and stirring up sediments).”

“Don’t like dirt road (James Road); boat landing has shallow water.”

“Channel between Bird Lake and Upper Eau Claire needs improvements.”

“Increase in muck and floating weeds; allowing cray fish trapping; skiing regulation.”

“Nothing – fine as is.”

“Poor walleye fishing; apparent lack of attention to walleye structure work by Conservtion Club; low numbers of panfish.”

“Jet skis; water skiing.”

“Jet skis; water skiing.”

“Concern about the invasion of foreign species.”

“Campgrounds with access to lake (Enchanted Inn and Clear Water Resort); location of Mooney Dam Park; public access is hard to maneuver – very steep.”
 “Difficulty in backing down to put boat in lake; large values from large hp motors.”
 “Restrictions on water skiing.”
 “I can’t really think of anything about the lake I don’t like. I wouldn’t miss the noise from jet skis.”
 “Spearing.”
 “Jet skis and speed boats disregarding boat laws – noise and stirs up the water – disturbs fish and birds; noisy taverns at resorts; overdevelopment; high taxes.”
 “Town lack of effort to control or prevent exotic species; intro. of PUDs.”
 “Shallow areas.”
 “Too many people building on the lake.”
 “Birch – excess sediment on bottom.”
 “Poor fishing; many people want to tell others what to do and how to keep their property.”
 “Some properties have clearcut to the lake.”
 “Inconsiderate boaters who don’t follow rules; noise from the new gravel/asphalt business off Hwy. 27; high taxes.”
 “Jet skis; loud neighbors at night; poor shoreline preservation by some property owners.”
 “Not beefing up the shoreline to prevent erosion; over the years, fishing isn’t as good.”
 “The people who live on it. Think they own it.”
 “The jet skis. The motor activity. The loud vacationers.”
 “Too many lily pads and invasive plants taking over; too much sediment; wild jet skiers.”
 “Early restrictions on water skiing; boat landing; too many high weeds (about 4 feet out of water).”
 “Boat landing; restriction on water skiers; too many high weeds.”
 “All the restrictions for lakeshore development; the lakes are being fished out and not properly restocked; the channel from Birch to Upper Eau Claire is too low or small where the road bridge is.”
 “Lack of fish; the public landing; loss of aquatic vegetation – lily pads, reeds, etc.”
 “Water quality – more residents than the lake can tolerate – pure sand shore allows too much nutrients into the lake.”
 “Too many PWCs.”
 “Lakeshore restrictions for property owners.”
 “Too much development – mainly some cabins/homes are too close together.”
 “A lot of the new year round residents ideas; they should allow more water sports after 6:00 p.m.; the taxes.”
 “Rusty crayfish; poor fishing; weeds washing up on shore.”
 “Algae really bad this summer; green floating algae.”
 “Water clarity continues to decline; no ban on phos. fertilizers; no county zoned protected wetlands/shoreline.”
 “Just keep the hp of boats to a med., max. 50 hp.”
 “Manicured lawns; building on every foot of shoreline.”
 “Rusty cray fish are a nuisance at times; jet ski usage is a nuisance during summer months.”
 “Power boat noise; long drive to get there.”
 “Jet ski; water skiing after 5:00.”
 “Cannot think of any.”
 “Birch – too much muck.”
 “Not being patrolled enough for big boats; people do not respect the lake.”
 “The Sept. duck hunters set up decoys in front of my channel and shot three of my pintails – very depressing to hear the gunshots and see the ducks I feed fall out of the sky dead; no herons; no bald eagles – only saw two loons this year – very depressing.”
 “All the building going on; all the jet skis and boats.”

15. Which term best describes the lake’s public access? Response to “why.”

“Addition of second boat ramp.”
 “New landing.”
 “We have a boat landing.”
 “It has a new boat landing and access from Upper Eau Claire.”
 “Not much parking.”
 “Easy to get to.”
 “None”
 “New ramp.”
 “Moody Park Campground boat ramp.”
 “Deep and easy to launch.”

“No good swimming beach.”
“Flat boat landing, adequate parking.”
“It allows morons to put in their oversized pontoons and large boats easily.”
“People fighting not wanting anyone to use the access. We need the access for people who do not live on the lake.”
“It is just thru a channel in Robinson Lake.”
“It has easy access through the channel from Lower Eau Claire.”
“New launch ramp deeper in water.”
“Public boat landing.”
“It doesn’t have any.”
“Well maintained with dock.”
“Parking.”
“It connects to Sweet Smith and Upper Eau Claire.”
“No boat landing, channel needs dredging and cattail removal.”
“Mooney Dam is easily accessible.”
“Doesn’t have one.”
“Monitoring effort for invasive plant life is appreciated.”
“One landing is very adequate.”
“Ramp on lower Eau Claire is dangerous.”
“Good public landing.”
“Sure was poor timing on replacing boat ramp. Could have been done in spring or fall.”
“Good location and good facility.”
“Keeps out a lot of weekend traffic, i.e. fewer jet skis.”
“The only public access is at the channel over to Middle Eau Claire unless they have added a landing we don’t know

about.”

“To my knowledge, there is only one.”
“It’s brand new.”
“Not allowed.”
“Easy in, easy out.”
“Just rebuilt.”
“Because there is public access and handicap accessible.”
“The boat launch on Middle Eau Claire is being rebuilt.”
“No boat landing.”
“The access is suitable for size of lake.”
“New landing.”
“Don’t know if beyond seeing dam recess point.”
“Bony Creek is access.”
“Easily.”
“Don’t understand question.”
“Located in good area, well structures.”
“No public access.”
“Dock placement leaves limited access from boat launching.”
“New.”
“Existing boat landing provides good public access, but does not visually impair lakeshore.”
“Bony access is through middle.”
“Good except for fence too close to road by access on upper. Room for lake visitors to park.”
“Hard to maneuver backing down – too close to dam/current. We look at this as a positive in keeping too much boat

traffic.”

“No restroom/toilet facilities.”
“I was surprised the amount of money they used to update the landing. I didn’t see anything wrong with what we

had.”

“Landing is too shallow.”
“Easy to get to.”
“It’s brand new.”
“Remodeled.”
“Difficult for me to back down ramp.”
“Too good. Too many non-property owner jerks showing up.”
“Good dock, easy access.”
“One paved landing.”
“Channel in and out of lake is too shallow.”

“Easy on/off. Needs more parking.”
“Has dock; good boat launching; plenty of trailer parking; porta potty; trash pick-up, etc.”
“Well maintained.”
“No toilet.”
“DNR landing off STH 27.”
“Clean, easy to maneuver launches.”
“Public landing.”
“Never use it – there’s always room for improvement.”
“Upper ramp has large hole and a sharp rise.”
“Public needs to get on either Robinson or Upper.”
“Limited parking.”
“There are access for boats.”
“New.”
“No turn around space – long way to back up.”
“Well maintained boat landing, clean, etc.”
“New boat landing.”
“No public access.”
“Landing is well-built – good parking area. It’s great to have a porta potty there.”
“Finally blacktopped and nice dock. Thanks.”
“Was terrible. Now much improved.”
“New.”
“It appears alright.”
“Just renovated this year.”
“It’s on another lake.”
“None.”
“Easy access/gentle slope.”
“Dock is not in long enough. Washed out past concrete on ramp.”
“Easy with dock/garbage.”
“Good boat landing.”
“Not used much – adequate for use.”
“Well maintained landing.”
“Well located, maintained.”
“Current.”
“Very little parking.”
“Only one – able to manage the numbers.”
“It really doesn’t concern me.”
“Good boat ramp.”
“Difficult to back down lengthy drive.”
“If were better, there would be more people using the lake.”
“Too good – wish it wasn’t there.”
“Excellent boat landing.”
“Easy to get to from Middle Eau Claire without direct public access.”
“Poor design – why would you put a dock on the blind side for backing in?”
“Middle Eau Claire is excellent.”
“End of ramp in water is too high above lake bottom making launch and take-out difficult.”
“Worse than before it was repaired.”
“Easy to use.”
“None – access from Middle is nearly impossible due to sand in stream connecting.”
“Too crowded.”
“Landing is not adequate for pontoons.”
“Excellent boat landing at Lower Lake.”
“Shallow water, limited parking.”
“It’s a little unkempt; but for me, I don’t care.”
“Just rebuilt in 2006.”
“Public access at our lake with locks access at other.”
“Efforts to keep up with maintenance.”
“Launch ramp somewhat difficult to use.”
“Public boat launches and campgrounds.”
“Very good – I use it quite often.”

“It has recently been improved.”

“One landing limits opportunity for non-native species infestations.”

“Steep incline to back in with a turn.”

“Has no public access.”

“The access more than keep up with the normal need to use the lake. It seems that only on Memorial Day and July 4 are there about 8 boats to be put in.”

“Steep ramp – good depth for boat.”

“It’s some distance away.”

“Over developed.”

“Traffic is held down due to the parts in the channel that your boats must be pulled through.”

“Clean, deep loading ramp.”

“Adequate dock and parking; good signage; latrine.”

“Ease of use.”

“No parking.”

“Landing on Robinson needs repair.”

“On lower, access isn’t to the main part of lake.”

“Very good since dock was installed.”

“No public access.”

“A new landing.”

“It was just rebuilt – easy ramp to use.”

“Don’t use it.”

“Access.”

“No landing – tiny bridges.”

“Very nice boat landing.”

“It’s brand new.”

“DNR improved boat landing.”

“Shallow water in the channel to Mid Eau Claire Lake.”

“New boat ramp.”

“Obstructs traffic on Island Road.”

“Just put in a new boat ramp.”

“Recently rebuilt.”

“Shallowness of access.”

“Home provided.”

“Both up Eau Claire and Robinson have good access.”

“Ramp and dock are fine.”

“Impressive boat launching area.”

“Newly remodeled this year.”

“Needs dock on Middle launch.”

“Available.”

“Because there is none.”

“Needs repairs – landing isn’t the easiest to get in and out.”

“Too good, attracts too many people.”

“Good boat landing.”

“Too good – after paying taxes – I don’t want more people on the lake.”

“Simply seems convenient and adequate in size.”

“Poor dock quality/maintenance/trees need trimming above launch and on sides of driveway.”

“New ramp and handicap access put in this summer.”

“Well maintained.”

“Someone got a lot of money in his pocket by selling the public access to horrid loud people with jet skis.”

“No public access to Birch.”

“Good ramp, dock, and parking.”

“Need another boat landing – too shallow – big boats tear up bottom making lots of sediment.”

“It’s a little steep and sometimes crowded.”

“Don’t have one on Birch Lake.”

“Has access point.”

“Because it’s new.”

“Good quality, but too accessible.”

“Only one access.”

“It’s adequate.”

“Well constructed.”
“Should have double access side by side.”
“It is a new facility.”
“Hard to get to.”
“Cement launch.”
“Because only can get on Bony Lake through channel.”
“Only one entrance that is well kept.”
“Boat ramp.”
“Closer to cabin – have to go on the other side of lake.”
“Not enough places, especially ones with sandy beaches.”
“It was just repaired and did a good job.”
“Dock could be longer.”
“It’s new.”
“One access opening for swimming; one for boating.”
“Cannot get down river onto big lake in a kayak, canoe or fishing boat.”
“Boat landing is very nice.”
“Decent boat landing.”
“Just enough and not intrusive.”
“Redid the boat landing and did a great job.”
“There is no public access unless you come up the channel.”
“Easily accessible – having been rebuilt recently.”
“I don’t know where it’s located.”
“This year, there was authority at boat ramp and be sure watercraft wasn’t polluting the lake.”
“No access on Birch.”
“Shallow channel (too shallow).”
“Town of Barnes sold it to a private owner who put up a cabin – Sweet Lake property owners never notified in advance of sale. People are noisy and poor neighbors.”
“No public access.”
“No public access.”
“Nice boat landing – great dock and ramp.”
“The ramp is covered with sand, hard to remove boats.”
“Size is adequate.”
“Has been modeled, but no facilities are available.”
“No concrete landings.”
“Hard to get under bridge on lake road.”
“New boat landing.”
“Public landing.”
“Because it is new and user friendly.”
“The town offers a well maintained boat ramp and a swimming area.”
“The town park has good access to the lake and the river.”
“No public access and none needed.”
“Upper Lake launch ramp. Good river access.”
“Long way to back boat downhill.”
“Easy to use, dock.”
“Soft sand – shallow water – no turn around area.”
“Doesn’t have one.”
“Can launch from Upper Eau Claire.”
“Landing is too shallow.”
“Has a concrete slab.”
“Just was rebuilt; handicap availability.”
“Brand new boat landing.”
“There is access – enough parking to allow enough people a guest per day.”
“Close and not deep enough for huge boats.”
“More safe parking and docks in on time.”
“One boat ramp need public on north.”
“Looks good but don’t use.”
“We like the fact that there is no public access.”
“It is via a small channel so it keeps outside traffic to a minimum.”
“Shallow water for launching.”

"There is a landing with a pier."
 "Two ramps close by – sufficient."
 "Access is good in summer, but not so good in winter."
 "This lake uses public access on Middle Eau Claire."
 "Shallow – poor dock – limited parking."
 "Have not seen public access this year but understand it has been rebuilt."
 "Very steep to launch a boat."
 "Newly refurbished; don't like large rock in water near ramp."
 "Brand new ramp, etc."
 "Recently remodeled."
 "Good boat landing."
 "None – no public access."
 "Ample boat access."
 "Better than old one."
 "It's ok, but could have better maintenance of dock and concrete pad in water."
 "Town vacated access for council woman's husband."
 "Nice access – again quiet area of lake."
 "New dock."
 "Huge holes dip in the sand and it's totally uneven."
 "Uneven."
 "The boat landing is very uneven."
 "Not a long wait, but should have a light at night."
 "Boat landing on Robinson is not level."
 "Boat landing not spacious."
 "We had a great access by the bridge which was closed."
 "Just redone – excellent shape."
 "New boat landing – very nice."
 "Too crowded."
 "Like the upgrade this past summer."
 "Good and bad. Wonderful, easy access encourages more use from visiting boats."
 "Recently been upgraded with new ramp and docking area."
 "Because it does not impact me."
 "Good and improved landing on east end."
 "Good slope – poor parking."
 "As far as I am concerned, one landing a lake is good."
 "Because you need to go through Middle Eau Claire to get to Bony."

18. What steps have you taken or plan to take to control runoff on your property?

"Keep lake shore vegetation as natural as possible."
 "Undisturbed natural topsoil."
 "Repair of our rip rap wall."
 "Being I have no blacktop or concrete surface (parking lot driveway), I just use the natural way of runoff."
 "I have at least a 10 foot barrier on my lake shore."
 "We have left 75+ feet of property back from shoreline undisturbed. We don't mow it or attempt to change vegetation. We have little or no slope to the lake, so a ditch is not needed. We do not use fertilizer."
 "Left brush and grass along edges."
 "Minimized lake shore mowing (compared to previous owner and neighbor)."
 "Promoted natural vegetation. Have not used chemical fertilizer. Landscaped vegetation barrier."
 "No need."
 "Keep natural vegetation; avoid use of fertilizers; new septic system."
 "Planted grass."
 "All of our shoreline is natural except where boat dock is."
 "Natural."
 "Plant grass; left natural vegetation."
 "Rocks on shoreline to prevent erosion."
 "Leave shoreline and bank as natural as possible. Plant grass on lawn so the soil/sand doesn't run down to the lake."
 "We've made no attempt to landscape or in any way affect the steep bank leading to the lake."

“Planted hundreds of trees and shrubs (native) and created numerous natural vegetative barriers. Planted ground covers and slopes along with shrubs and fencing to stop erosion. Keeping my large driveways and steps stone, grass and natural.”

“Well controlled.”

“Maintain natural vegetation.”

“We have no shore line. We have left eh hazel brush grow. There is no swimming – no pier. Natural. No fertilizers.”

“None necessary.”

“Our shoreline is all wetland.”

“We already have a 20’ to 25’ vegetation barrier along our entire shore line, except for the 4’ where my dock is. We have planted many shrubs and other plants along the shore line.”

“I have no runoff.”

“Road water runoff to off lake marsh; rainwater collected.”

“Planted grass – left natural growth of bushes.”

“Encourage natural vegetation.”

“Have a buffer zone.”

“Leave natural vegetation barrier.”

“Our 450’ frontage is pristine and heavily wooded so there is no runoff. God is the only one taking down trees.”

“None needed.”

“We don’t cut grass or otherwise interfere with the natural vegetation between the house and lake.”

“Vegetation, logs and rocks against shore.”

“We do not move our hillside trees; plantings on lakeshore.”

“No fertilizers, herbicides; land close to lake is flat.”

“We’ve left natural vegetation and planted more. We’re on a windward side of lake – wish we could place boulders on shore to prevent erosion. We made rain water collection part of our recent remodel and planted grass/trees/other vegetation.”

“Left it alone (no development).”

“Limited clearing and opening vegetation, planted grass.”

“Established no-mow zones; planted vegetation; diversion berm.”

“We don’t use any fertilizer; we leave shoreline natural.”

“This depends on the lot elevation. We have a grass buffer to the lake. I don’t know how you implement this, however, parts of a lake needs different attention.”

“Seed down grass seed.”

“Property is still raw land – undeveloped.”

“Cost to work on vegetation barrier.”

“We have installed a DNR approved rock wall at water’s edge; planted shrubs, etc. and built tiers on a previously sandy eroding slope (a slow and expensive project). Installed gutters on all buildings. Plan to do more with collection. Planted many varieties of native vegetation along the shore. Lots left to do.”

“We’ve stopped mowing by lake front and have gently graded (terraced the lake side of house) and planted and seeded the area to stop erosion. Some in front of house – put in drains and rock and sod to stop runoff.”

“None. Our property is all sand – zero runoff.”

“Planted vegetation.”

“We have mostly natural shoreline and a 75 foot buffer zone in front of our year round home. The 75 year old lot cabin remains as it has for as long as we have owned it – 20+ years.”

“Already have barriers.”

“None.”

“We haven’t altered the natural habitat.”

“Planted shrubs and trees.”

“Maintain current landscaping.”

“I have a steep property to lake – put in staircase to minimize erosion. Other than trees downed in storm several years ago, the vegetation has been left as natural.”

“Rock barrier and wild grass undeveloped natural shoreline.”

“Trees and shrubs.”

“How about property tax refund? Don’t mow grass; big buffer/no weed cutting in lake; no tree cutting; use phosphate free.”

“Really my cabin is set a little back on an upslope so runoff is not an issue.”

“Four foot buffer is now three years old.”

“More vegetation; don’t cut grass or weeds.”

“Direct all downspouts away from lake. Landscaping of slopes.”

"I have 270 feet. All is undeveloped natural except for approximately 20 feet. I plan on not changing anything."

"Allow natural vegetative buffer zone to develop along 90% of frontage."

"Don't need any changes."

"Protect and enhance good natural vegetation buffer between shoreline and building site."

"We have always kept property natural. Only 15 or 20 feet where birch trees have died. We used to put in our boats. In fact, we plan to replant that. 50 years in our family – nothing has been cut."

"Leave natural shore – we've done that for 30 years; planted more trees within 300 feet of lake edge."

"Maintaining undeveloped, natural vegetation. Have defined pathway/steps to lake to avoid disturbing natural vegetation."

"Let the natural sandy area absorb all rainwater. We own lake property because we like to see the lake and not look through alders, reeds, weeds, etc. A better solution to protect the shoreline is rip-rapping."

"No phosphorous fertilizer; landscape vegetation; buffer between lawn and lake."

"Already in place."

"Adequate installation of rain gutter; landscaping; retaining walls; seeding of sand and gravel areas."

"Want to do shoreline stabilization, but DNR won't allow it. Putting in new septic system."

"No grassy lawn – natural vegetation – no chemicals used – trees planted after storm toppled existing trees – natural shoreline – no leveling beach area."

"I don't think we have a problem."

"Sand barrier and natural plants."

"Rain spout to woods; left natural plants in place."

"Plan to plant some trees on the bank and plant shrubs/evergreens at the top of the bank."

"Flat area to absorb any runoff. Healthy vegetation on flats to hold runoff."

"None."

"Natural vegetation."

"Landscaping to reduce runoff and control erosion."

"None needed."

"Sloped drive back into sand hillside to keep water from eroding hill toward the lake. Planted grass on all downslopes toward the lake to stop erosion. Installed fencing flat on the slope to keep ATV from rutting the slope down to the lake. The grass grows up through the fencing which also helps."

"Wood barricades on path leading down to lake to stop runoff. Rock barriers next to drive to slow flow of water. Planted trees in abandoned roadways."

"Restoration of beach area (buffer), allowing fallen branches between house and beach to remain, maintaining 30 foot window between house and shore, no grass cutting between house and shore."

"Not on lake."

"Vegetation barriers. Grow better lawn to absorb runoff."

"Maintain natural growth on entire property as much as possible and still provide safety to home. Rock and tree barriers at water's edge in addition to natural vegetation."

"None, but I don't believe it is a problem as the lakeshore area is covered with natural vegetation."

"Plant more grasses, bushes, etc."

"Planted a vegetation buffer, planted 45 pine trees, planted 100 natural grasses and wildflowers, planted 35 various native bushes, we only cut a 30 foot view corridor."

"We already have a lake buffer/grass/vegetation."

"Planted trees."

"We have all possible means of erosion control."

"Leave the shoreline vegetation alone – do not cut."

"My cabin is set back. I don't have shore/beach. I don't use fertilizer."

"Do not cut all the way to shoreline."

"None. Don't need to. We have large virgin pines and there are no runoff areas. The bank in front of cabin is natural and has increased its height/length as the frozen ice pushes up against it. 40 years ago it was not so. We neither mow our yard. We let the pine needles stay naturally – no fertilizer either."

"Lots of landscape timbers in yard."

"Landscaped vegetative barrier."

"Limited cutting of brush and trees. Maintain grass lawn growth."

"In the process of planning additional shoreline restoration projects."

"Retaining wall."

"Don't think any runoff on my property. Have tall vegetation along lake."

"No plans as yet – in the future we would like to put in several gardens of bushes and perennials to help with the runoff. We need to actually develop a plan."

"I did plant grasses on a cleared area that now has zero runoff to lake. Nothing neas as before 15 years ago."

“Very very very little runoff with all the sandy soils of our region. Also, nature provides a great buffer by a natural berm of soil at waters edge from the ice drifting during ice out period.”

“Gardening and vegetation.”

“I’m not aware of any runoff.”

“Undeveloped area 30 – 40 feet from lakeshore.”

“Not an issue for us. We have pretty much left it natural, our building site is hundreds of feet back from the shore.”

“It’s a primitive undeveloped piece of land, especially at shoreline.”

“We leave the natural vegetation except for a very small area (about 6 feet) by dock.”

“Planted native plants/grasses; minimize mowing; do not use fertilizer.”

“None.”

“Most of our shore and land from cabin to lake is natural 80 – 90% at least.”

“I recently installed a rain garden on my property in the City. Given the free time, I would like to install one on our lake shore property.”

“More natural vegetation.”

“Runoff is not a problem – there is a ridge with trees between land and the lake.”

“Kept in natural – no lawn.”

“We don’t use any lawn fertilizers and try to rake up all clippings for removal to the woods. We have not removed trees on a slope (to prevent erosion). We have a gravel driveway. Our land is only sand – no pooling of water.”

“Rock gardens, plants and trees.”

“Plantings on bank; build up shoreline.”

“Retention of trees in lawn; grass carpet.”

“Driveway water retaining breaks; rock shoreline; undeveloped shore.”

“Plant vegetation and continue to not mow to the shore.”

“The lakeshore is left in its original state as much as possible.”

“We have only opened the shoreline on about 1/3 of our frontage. About 100 in front of our cabin is open, but 300+ feet remain wooded.”

“Planted trees; adhered to rules about vegetation removal.”

“Left shoreline natural.”

“I have allowed significant regrowth of natural vegetation along 95% of my lakeshore. This seems to be an effective buffer. I have also planted dozens of new trees in the shoreline buffer zone.”

“Rain water collection areas; controlled drainage ditch.”

“It has heavy vegetation. We use no fertilizer.”

“We’ve maintained the natural vegetation throughout our 6-1/2 acre, 175 plus shoreline for over the 40 years we’ve owned the property. Even our shoreline is natural (15 feet for small dock and boat).”

“None – water runs directly down and immediately in sugar sand.”

“Retained and encouraged natural vegetation; placed rock under eaves to prevent washout; retained gravel driveway; planted natural vegetation – trees, grasses, native plants.”

“Keeping people who are crazy naturalist, away from our property.”

“Leave the natural vegetation as much as possible; we have a large level spot down by the water’s edge.”

“Built rock wall. We do not fertilize.”

“None.”

“None.”

“Water diversion to low areas where it can be absorbed into ground. Widened vegetation on shore. Eliminated sand beach. Bermed lake edge to stop direct runoff.”

“I don’t have runoff.”

“Increased vegetation approaching lake.”

“No fertilizer used; vegetative barrier at chlorine and undeveloped shoreline.”

“Maintained natural growth – our property in flat 300 feet back from shoreline – maintained lawn.”

“Left natural vegetative barrier in place.”

“I have not created a yard per say, do not fertilize, have left a natural buffer from the lake to the house, try to use logs to protect against waves.”

“Natural buffer.”

“Extensive landscaping.”

“Left in natural state.”

“Natural vegetation along shoreline.”

“We have left the first 3 feet of lakeshore unmowed.”

“We don’t have a problem with runoff. There are no buildings on our site.”

“Lawn well kept. Absorbs water and CO₂ – gives off O₂.”

ago.”

“Of the 500 feet of shoreline I have, only 30 feet is beach area. All the rest is natural, the same way it was 80 years ago.”

“A natural plant/tree barrier zone 30 feet; no fertilizers used.”

“Limited landscaping, most areas left natural; new septic system.”

“None.”

“Runoff not a problem for me.”

“Vegetative barrier; no phosphorus fertilizer; leave elevated ice berm in place.”

“Vegetation and silt fence.”

“So far we have only talked about having the gutters drain to the side – just heard about this whole thing from Jan Elliott (Superior? DNR?) 4 years ago. Help! How to...”

“My problem is due to Dahlberg Electric who cut down an entire slope of natural vegetation that ran to the lakeshore. I was devastated. The Department of Natural Resources was called. They did not do anything about it. They were useless.”

“It already is controlled – not developed.”

“Left it natural with one small (10”) opening on 660 foot frontage.”

“We have maintained natural shoreline.”

“Retaining wall.”

“For the most part, have left frontage in its natural state. Do not see any signs of erosion.”

“None.”

“All of my shoreline has a natural vegetation border except by a pier which is a natural earth pier.”

“Landscaping and planted grass, trees, and other vegetation.”

“Have left logs parallel to the lake to collect runoff.”

“My lakeshore buffer is completed.”

“Stopped moving what had been lawn area 7 years ago; repaved driveway and restored ditch using breaker rock to prevent runoff into the lake.”

“Provide more natural buffer.”

“My choice, doesn’t mean I can force others.”

“Gutters on buildings; stone along building for drainage/rails to prevent wash; gravel driveway – neighbors blacktop causes heavy rain damage on our property; zoning should prevent this.”

“Most of my land has natural vegetation.”

“We have left our land natural.”

“Home built further back than required; vegetation in first 75 feet undisturbed.”

“Kept shoreline natural except for small beach area.”

“Runoff from my property is what nature naturally deposits into the lake.”

“The property is in a natural state. However, I would be willing to install permeable artificial grass and a barrier to reduce any runoff.”

“Natural rock/field stone borders between lawn area and vegetative barrier/lake.”

“None.”

“Vegetation.”

“Grass and tree barrier.”

“70 feet of 100 feet of shoreline is maintained in native forest/vegetation.”

“25 to 30 planting of bushes, tall grasses, flowers and plants.”

“Wild next to lake.”

“None of your business!!!”

“Stopped mowing near the shoreline; contacted lakeshore restoration specialist for assistance in implementing a restoration plan; held informational meetings featuring experts who could explain the reason for shoreland restoration.”

“Buffer vegetation; don’t use fertilizer.”

“None.”

“None.”

“Tree planting.”

“Rain garden and plain water collection; erosion control logs.”

“To the best of our knowledge, we have no runoff on our property.”

“Our lake front is all natural.”

“Buffer area.”

“Steps and natural vegetation.”

“I keep my land in the natural stage with natural growth of plants and trees.”

“Will plant trees.”

“All of our property is natural.”

“We have a deeded access with 10 lots owners involved which includes a 60 foot lake frontage outlot for all to enjoy. It is all grass with the edge of grass to sand/beach left a little taller as a buffer to discourage the geese.”

“Property is in good shape.”

“Hill.”

“Hoping to join the shoreline restoration project. No removal of any plant – the shore on our property is very good according to DNR models shown to me.”

“Rocks on shoreline.”

“Undeveloped natural shoreline for 50 feet back; no fertilizer; no mowed lawn.”

“Take care of the natural buffer zone we have between the lake and our dwelling.”

“None.”

“None.”

“Preserved the natural vegetation. No need for anything else.”

“None. I need education on what to do.”

“Our property drains into a spruce swamp – not into lake. We don’t own lakeshore.”

“Rain gutters, rain gutters and runoff diverted into woods. Protected at least 50 feet of vegetative shoreline buffer.”

“Have left almost all natural vegetation in place on the shoreline and land sloped to the lake.”

“Have a vegetative buffer areas, grass, shrubs.”

“We are attempting to redo the shoreline for landscaped vegetation barriers; we don’t use motors, no chemicals.”

“I don’t fertilize and I have a barrier.”

“We have never done anything to shoreline – left it natural.”

“Runoff is not a problem.”

“Planted grass.”

“None.”

“I live on Bony Creek.”

“Not on lake.”

“I have no runoff problems – sandy soil – live in the woods.”

“Fieldstone retaining walls near house. Adding a lot of dirt and planting grass in area below retaining walls surrounding house. 100% undisturbed waterfront and steep slope.”

“None.”

“Plantings, rocks, fallen trees.”

“All 75’ to lake are undeveloped, natural vegetation.”

“Vegetation.”

“Natural vegetative barrier. Leaving large areas of natural vegetation on the rest of the property.”

“We let vegetation grow on the hillside. We leave grass long down by the lake. We do not use chemicals on anything and eco soap in house. We have water diverters.”

“Property is undeveloped natural vegetation.”

“Natural vegetation barrier.”

“Have trees and brush by water. Hillside terraced to help with erosion.”

“We have let our whole shoreline go natural.”

“I have left all of the trees, grass (natural) untouched between cabin and lakeshore. This has prevented any fast runoff into lake.”

“Planted trees and shrubs.”

“I have unimproved property.”

“Keep it as it is.”

“Culvert in driveway. Keep up grass – vegetative barrier.”

“Doesn’t apply.”

“Increase vegetation (grass) or mulch (pine needles) along paths on slopes.”

“None.”

“First 75 feet of our lakeshore to cottage is totally natural except for oak/timber graduated steps.”

“Don’t have much of a problem – level lot – very sandy.”

“It’s flat. The sand up there, water goes through, rather than runs off.”

“Do not cut to waterline; leave natural vegetation in place; control erosion on steep hill.”

“Do not mow within 25 feet of water line, letting natural vegetation grow back. Mowed fire pit to within 50 feet instead of 20 feet. Did because required to do so when applying for permit.”

“Worked with D&R to riprap the shoreline over 10 years ago.”

“None.”

“The land has been kept the way nature grew it. We cut only those trees that are damaged or offer danger to buildings and people. Restored a bad gully to grass land. Allowed trees to remain in water at shoreline (when they fell) to prevent shore erosion and provide cover for minnows.”

"It's our property. We pay taxes for the lake front. We have had ditches since 1964. Strong oppose as long as there is no garbage. We should be able to do what we want. No one knows what natural is because this area was clear cut in 1900. No one has the right to tell us what to do on privately owned property."

"Strawed backfilled areas around construction to start new grass."

"Leave natural except for dock access."

"There is no runoff. The rain comes and goes into the ground just like it always has."

"Natural vegetation; diverted by grading so much rain water goes to back portion of property and is absorbed rather than flowing into lake."

"We have kept our lakeshore in its natural vegetative state."

"We have grass and trees right to the lake. We do not put any man made substance on any of our property."

"Naturalized lakeshore."

"None. I have a natural barrier (ice push-up) that prevents runoff."

"I would like to have rock on shoreline to prevent the water from washing under shoreline."

"It's not a problem on our property, but have left the natural barriers intake anyway."

"Cabin has rain gutters and roof line away from lake."

"We planted ten trees on our beach this summer and added vegetation."

"Don't have a problem."

"Permitted natural vegetation; terracing."

"Planting more vegetation along shore – grasses and trees; protecting shoreline with rocks."

"Provided natural barrier."

"None. Runoff is natural drainage of lake. The only concern is what is being runoff from ground into water. Only those who are allowing chemicals to be runoff should be stopped or penalized."

"All natural lakeshore; no beach."

"None, no need."

"Don't use fertilizer or pesticides. Property is flat with little or no runoff."

"Most of property is densely wooded with high elevation."

"None. We have a very gentle slope with grass and natural growth on the lakeshore."

"Planted grass where there was just dirt before."

"I have very little grass that is mowed. All vegetation on the property with the exception of a small lawn around the cabin is in its natural state."

"Natural vegetation allowed to thrive."

"We are currently seeding in grass to cover the exposed sand from our new septic system. We keep a buffer at the shore."

"Natural vegetation barrier."

"Rock formation to prevent erosion of shoreline along with natural vegetation."

"Natural is adequate."

"I am a strong believer in having a vegetative barrier near the shoreline. I also have as little lawn as possible. Natural is best."

"During construction a silt fence but the building site is 140 feet setback from the lakeshore."

"None needed."

"No phosphorus/no fertilizing near lake/90% of frontage is natural on lake/ 100% of frontage on river to Sweet Lake is natural (own on both sides of river)."

"None – not near lake."

"Planting trees and shrubs to allow the flow and hold the soil."

"Let vegetation grow along the shoreline."

"Plant vegetation."

"We have flat shoreline access with grass and a natural berm (ice push-up) between water and lawn. There also exists healthy shoreline vegetation."

"Have only very small area open."

"Keep lawn to shoreline and left buffer area grow for past 25 years. Left reed and lily pads grow."

"Natural vegetation."

"No runoff."

"The property doesn't have runoff the way it was designed."

"Landscape so that no runoff does not reach the lake (retention areas)."

"Sand barriers; let vegetation grow; vegetative barrier."

"Installed drain tile on buildings to drain water away. More trees will be planted along with wildflowers from the lake vegetation."

"We do not use any chemicals. We mow grass in the direction away from the water."

"Use no chemicals or fertilizer on our land."

“Leave the undeveloped natural vegetation.”

“Leave vegetation growing along shoreline.”

“Keep minimum area cleared – about 10 feet is all you need. Developed ATV ground erosion control for hill that’s 100% effective. Tried to tell neighbor to not pull all the lake reeds – he did anyway.”

“It’s all sand – what runoff? Everything goes into the soil – fast.”

“Natural vegetation left lakeshore.”

“Leave entire shore natural.”

“We use no fertilizers and leave it pretty natural at shoreline – we mow vegetation, but at least 10 years from lake.”

“Gravel (not paved) driveway with runoff channels into wooded area (not toward lake); rain gutters on home with spouts directing water away from lake; natural vegetation along shoreline.”

“Have planted native plants along half of our shoreline.”

“We eliminated use of a part of the beach. Bushes and a tree have been planted. Much of the shoreline is left to grow wild.”

“Add terraced walkway path; maintain unmowed grass and vegetation areas on hillside.”

“We have vegetative buffers where there is lawn. We use zero phosphate fertilizer on lawn.”

“Plant more grass.”

“We have done very little to the shoreline – dock and boat lift.”

“We will be doing landscaping around our cabin with rocks to help absorb and stop the rain from running down.”

“None have natural vegetation between house and lake.”

“Keeping undeveloped area near water line.”

“We have a swamp and no lawn – all natural except for 20 feet of grassy access to the beach. Runoff is not an issue for us.”

“No runoff problem.”

“Stopped mowing by the lake; allow natural vegetation to grow.”

“Have preserved natural shoreline (same as it was 80 years ago when Father-in-law planted white pines all along shoreline).”

“None.”

“Put in large rocks.”

“Have no problem.”

“We have left the entire shoreline in its natural state.”

“We do not have any lawn, but have all natural (undeveloped) vegetation surrounding our property. It is truly in the woods.”

“Maintain natural vegetation, don’t disturb topsoil anywhere near the lake. No chemicals, minimal mowing.”

“Veg. buffer along shoreline, no landscaping/development of 80% of my shoreline, will add greater buffer width to shoreline next year.”

“Grass.”

“None, it’s condo property others won’t go alone.”

“Natural vegetative barrier.”

“Planting vegetation, retaining wall.”

“Planting grass, retaining walls, rocks.”

“We keep and plant a lot of vegetation and trees.”

“We have a vegetation buffer that isn’t working well. A rock wall or retaining wall would stop the erosion more efficiently.”

“We have three water diversion (wood) rain gutters on our driveway.”

“Runoff does not appear to be a problem.”

“Vegetation, retaining walls.”

“Have left it alone for the most part. Only small % is cleared for access to lake and building site.”

“I do not have any runoff from my property.”

“Leave natural vegetation along shoreline.”

“Planted grass, allowed natural grasses and plants to grow along shoreline.”

“Have let the grass grow.”

“We own property that has a natural lagoon on the shoreline. We intend not to sell or develop this area. Installed in-ground rain water collection and rock drain field to control runoff/erosion.”

“No, home, no runoff – national large pine tree.”

“Leave what natural vegetative barrier in place – basically the way the lakeshore was when we purchased this property decades ago.”

“We have left the shoreline natural and encouraged natural growth on hillside barrier.”

“Limited opening to lake to four foot to pier – rest is undisturbed natural vegetation.”

“Not needed – natural existing runoff works fine.”

“Unaware of any runoff problems.”

“We have 150 feet of natural barrier – entire shoreline.”

“Clean out the springs and leave rest of shoreline in natural state.”

“There is very little runoff due to small cabin and limited careful no lawn or lawn mowing – all ferns and grasses use by occupant. No chemicals are used in-house that are not biodegradable or organic.”

“Our property has not been changes in any way. It is all natural vegetation and trees.”

22. Which group or groups do you feel should be responsible for lake improvements? Response to “Other.”

“DNR already owns all lake shore.”

“Do you mean responsible for zoning? For regulating buildings and usage?”

“DNR.”

“All of the above.”

“As long as lake has public access, it should be supported by the public.”

“Resort owners; everyone.”

“No local organization.”

“Enforce laws already in place.”

“Better fish stocking by these.”

“Don’t know.”

“Locals should be permitted to offer suggestions/requirements.”

“Depends on the improvement.”

“As long as lakes are declared public property, government agencies should be responsible for upkeep, not only property owners.”

“Eau Claire lakes conservation club.”

“This must be a combined and very active results oriented effort.”

“Depends on what you mean by improvements.”

“None – leave most lakes alone.”

“I just don’t have complete faith in individuals that they will get informed and then act on their own without having self-oriented motives.”

“Resident and non-resident users.”

“Everyone.”

“All the above.”

“I don’t understand this question.”

“All of the above.”

“Committee for all sides of issues.”

“Lake groups of owners.”

“DNR.”

“Businesses on waterfront.”

“All of above working together.”

“No government – too often controlled by money.”

“What lake improvements.”

“Only two answers don’t do it. One property owner doesn’t have the voice the association has. C and G have to cooperate to for funding and enforcement.”

“All of the above.”

“All of the groups.”

“Campground owners for percent of campers.”

“A logical combination.”

“But individuals need to do what they can on their own property.”

“Definitely not the property owners association.”

“All that use the lake.”

“People who want to live near the water and enjoy the lakes should be held responsible.”

23. Given what you know about the lake, if you could change one thing about them to increase value to you personally, what would you change?

“Better septic enforcement.”

“Stop water skiing and jet boating.”

“No wake lake – keep what little we have left the same.”

“Regulate noise from commercial establishments. Who wants to listen to bad karaoke at 1:00 in the morning?”

Enforce rules re: number of docks and boats on property. Some resorts are solid boat from one property line to the other.”

“Change the zoning – not allow PUDs too much stress on the lake.”

“Limit horsepower of outboards – prohibit jet skis and water skiing on small lakes like Sweet.”

“New dock for handicap. Put where there might be some fish.”

“Reduce/restrict use of high powered motor craft.”

“Fishing.”

“Enforce no wake rules per state DNR ordinances. Install no wake signs and/or buoys if necessary.”

“Nothing.”

“Maintain property.”

“We like it as it is.”

“Public beach development.”

“Restrict size of motors on small lakes (less than 100 acres).”

“Institute a county-wide septic tank inspection.”

“Keep the large boats out of this small lake and dredge the approximately 1/3 of lake which is basically unusable due to years (past) of dumping sawdust. This had created a much, much smaller lake.”

“Really nothing. As is now very good.”

“Enforce existing regulations, education of residents.”

“Campgrounds. Not allow using pollutants and killing weeds without permission. Lighting all night. People have complained. Spearing regulated at a different time.”

“Reduce building density.”

“Dredge Birch Lake to remove much of the muddy silt bottom which would deepen the lake.”

“Permit some dredging to remove some of the silt that has collected over the years. This would improve the usability of the lake.”

“Don’t know.”

“Not sure which one thing would have largest impact.”

“Get rid of mud.”

“Amount of algae floating by.”

“Paved road.”

“Would require all shoreline to be replanted with natural growth leaving only a small corridor to the lake.”

“Eliminate rusty cray fish, they have eliminated 95% of all weeds and caused crash of fishery. See data from fisheries study done by Brule DNR office. No fishable population or panfish or a lake that once had great crappie fishing.”

“Get rid of the 10-5 ordinance that is not enforced.”

“Control lily growth (but not grass dewatering).”

“Assure no greater density development than one dwelling unit per 150 feet. Assure no condo development on the lake.”

“Ban jet skis.”

“Establish a fee for non-property owners for boat launching lake use for a lake maintenance improvement fund.”

“Limit jet skis and water skiing to between 11 a.m. and 5 p.m. and limit swimming and bathing on access at Lake Road/Birch Lake channel.”

“Work on preventing spring shore damage from ice. Ice causes more erosion damage than anything else on our lake.”

“Minimum building requirements and properties being free of debris.”

“Prevent further decrease in water quality.”

“I would eliminate the current 10 space (projected to be twice as big) pier installed by the PUD developer. Bony is too small for a marina. But, local and county zoning officials seem to cater to big development pressure and ignore the current taxpayers.”

“Ask people to not put anything in the lake they wouldn’t want in their own drinking water or bath water.”

“Mandatory inspection of septic systems.”

“75’ buffer zone of natural vegetation would be required except for a small 15’ corridor for dock.”

“All should adhere to an undeveloped shoreline.”

“Back off on road improvements.”

“Angry, narrow minded people telling us what we can and cannot do with our property.”

“The number of resorts on the lake.”

“Connections to more lakes.”

“Less use of high powered craft. When they leave, vegetation comes to the surface and is there irritating casting or trolling. It spoils fishing one to two days.”

“Eliminate ordinance that restricts water skiing hours.”

“No condo’s/high density development.”
 “Limit larger motorized boats.”
 “The amount of lily pads, pickeral weeds and muck.”
 “Mandate testing, and replacement if necessary, of all septic systems for a periodic basis – once every 3 years. Ban jet skis.”
 “No riprap at all. No lawns at all. Tear down shoreline boathouse (ugly).”
 “Little change required or desired.”
 “Restrict motor size.”
 “Allow no multi-living dwellings (condo’s apt., etc.).”
 “Limit motor size.”
 “Property owners allowed to do shoreline stabilization projects.”
 “Remove or limit number of campers at campgrounds and the dock numbers.”
 “No jet skis; less pleasure boats; this lake is a fishing lake.”
 “Decrease dwelling density such as camping, motor homes. Fight multiple unit developments.”
 “Indian spearing.”
 “We had a short road that services 12-14 houses/cabins that should have runoff control. This would be a service to all and would better protect the water quality of the lake.”
 “Eliminate restrictions on water skiing, tubing, and jet skis.”
 “Less population.”
 “Reduce elevation to the lake.”
 “Law enforcement of boating and jet skiing.”
 “No move development.”
 “Get rid of cray fish. Inspect all boats using DNR landing for bad weeds.”
 “Strong maintenance/enforcement of clarity of the lake.”
 “Less large mouth bass.”
 “Not sure.”
 “Nothing.”
 “We like the lake how it is.”
 “Lower taxes.”
 “Ban jet skis and fertilizers.”
 “Stop the growth. I don’t know how, but soon it will be overcrowded.”
 “Nothing.”
 “Dredge the muck out of lake.”
 “Rusty craw fish; jet skis.”
 “Limit motor size on boats and prohibit jet skiing.”
 “Expand times for water skiing and tubing, etc. until 7 p.m.”
 “We need no wake signs and buoys put in the channel – they have disappeared over the last year by the dam area. We’ll have shore erosion if people don’t slow down.”
 “Have a proportional amount of shoreline not be further developed.”
 “Nothing, leave things alone. We have too many restrictions now for a free country.”
 “Motor size.”
 “Wouldn’t encourage any new places.”
 “Identify all non-compliant septic systems and cause the owners to correct the problems.”
 “Limit density.”
 “Water quality.”
 “I love the lake as it is.”
 “Restrict development.”
 “Make the lakes 100% catch and release for all fishing. We would have good fishing in 10 years.”
 “Ban jet skis.”
 “Steps needed to preserve water clarity.”
 “Raise water level back to normal and not cater to Enchanted Inn owners.”
 “Reduce the use of high powered motors.”
 “Not a lot.”
 “Improve fishing; decrease algae.”
 “Control the plant growth so property owners have unrestricted access to lake property. Clear lake of plants which take over (e.g. cattails, pickerel weed).”
 “Make the lake a no wake lake.”
 “No additional building of houses on the lake.”
 “Raise water level by 4-6 inches.”

“Less development and less use.”
“Make it a no wake lake.”
“Enforce no wake rules or impose speed limit.”
“Eliminate PUD type development or other higher density development potential.”
“Improve water clarity.”
“Eliminate recreation hours restriction.”
“Close any and all trailer parks.”
“Stronger enforcement of shoreline restrictions on cleaning vegetation and near shore structures. Also, no clearing of surface of vegetation. Exception: foreign, threatening vegetation.”
“Focus on rusty cray fish control/elimination.”
“Enforcement of water craft regulations and size of water craft appropriate to lake size and reduce noise and light pollution.”
“Reduce the number of tree huggers on the lake.”
“Decrease the restrictions on water skiing and jet skiing. We like to water ski and also enjoy fishing and think it is very unfair to limit the times when we could do either of them.”
“Eliminate jet skis.”
“Nothing.”
“Deepen the outlet to Middle Lake so Bony could be used and enjoyed by more people.”
“Limit ski jets use; limit on speed of boat; better control by law enforcement.”
“Appropriate control of lake level at Mooney Dam controlled by Douglas County.”
“Limit the mass sale of lake property for development. Keep individual property ownership sacred.”
“Attract a restaurant that can be accessed by the water.”
“Increased fishing populations and size.”
“Eliminate all R/V trailer resorts on the lake.”
“No jet skis allowed.”
“Stock more walleyes in Middle Eau Claire to improve the fishery.”
“Create a very effective set of regulations to control the amount and type of development.”
“Limit development – but that would deny use of lake to others and would be wrong.”
“Keep Upper Eau Claire clean, i.e. fertilizer and septic systems. Also, a decrease in property taxes would be damn nice.”
“Now allow high density (more than one dwelling unit per 150 feet) development.”
“Shoreland zoning.”
“Restrict development.”
“Watercraft – motor limitations.”
“Keep the density of dwellings at four per 600 foot shoreline and limit planned unit development.”
“Lake should be restocked with fish each year with the help of % of property taxes plus each lake should have an Association, each map owner contribute \$100 or per year.”
“No jet skis. Better enforcement/education of lakeshore maintenance.”
“Show the speed at which the lake is filling in and disappearing.”
“Enforcement of current boat use, hour limitation and proximity rules, etc.”
“Would like to have all properties returned as closely as possible to their natural condition (more trees – brush, etc. – less lawns).”
“Impose a new building impact fee.”
“Work on eliminating the red crawfish; replenishing underwater vegetation; restocking fish and installing cribs for fry.”
“Try to get landowners not to remove all vegetation and logs from their swimming area.”
“I like the lake as it is.”
“Limit development and behaviors that adversely impact habitat.”
“Reduce lakeshore density.”
“Better walleye fishing.”
“This is a little late now, should have been done 40 years ago.”
“Get rid of nosy, controlling groups of people like property owners.”
“Better fishing – cribs/stocking/ice fishing control.”
“Sandy bottom for the lake.”
“Making access to the main part of lake in water.”
“Zoning would actually enforce rules re: capacity and number of boats at commercial establishments, noise and light ordinances.”
“Stock fish.”
“Improve recreational appurtenances; improved stewardship of the land/dying vegetation.”

“Not allow non-property owners to dock their boats permanently each summer.”

“Again, we do not own property on a lake.”

“Tighter restrictions on campground and high density development.”

“Stock lake with fish.”

“Dredge the lake.”

“Control noise and lighting from Buck and Bass Resort at night.”

“Change land use plan to not allow multiple dwelling development.”

“Restrict buildings to 150 foot frontage minimum – no high density.”

“Get rid of the geese and their droppings.”

“Nothing.”

“Campers and trailers on minimal property should not be allowed. This concentration puts excess pressure on lakes and shoreline.”

“Much higher level of fish management.”

“Less erosion of the shoreline (caused by jet skis and high powered watercraft).”

“Less density.”

“Buck and Bass business, crowded lakeshores.”

“Limit tree removal and jet/water ski use.”

“Convert resorts to private single family homes.”

“Can’t think of anything in particular. We are very happy with our lake and enjoy it very much.”

“No high density development.”

“More fish stocking.”

“No high density development.”

“Restrict jet skis.”

“Get rid of the ATV’s. They are loud and go all over the roads. They scare the wildlife and run over walkers.”

“A survey of septic systems on the lake and enforcement of necessary improvements.”

“Small improvements at landings.”

“Improve the water quality by decreasing nutrient land, get lake back to where it was 10 years ago.”

“Stricter controls to protect all of the lakes against non-native plants (milfoil, etc.).”

“I would make it a quiet no wake lake; I would make sure the lake was zoned so that no multiple units could be put up (buildings/150 feet); I would stop the dishonest trick that have ban used to allow building on less than 150 feet; get back the public access and take back Sweet Lake Road.”

“Stop people from fertilizing yards.”

“Non-resident users pay a fee at boat landing.”

“Neighbors property has a trailer house on it in addition to the cabin. Sometimes looks like a campground (overused).”

“Clean up east end of Birch Lake.”

“Stock fish.”

“Don’t live on lake.”

“No comment.”

“Restrict development so lakeshore remains natural, undeveloped and therefore have fewer jet skis and water skis. Keep buildable lots large, restrict landscaping.”

“Lower property taxes. Nothing good has changed for me in 44 years. Why are taxes raised if nothing good happens?”

“Keep the lake and surrounding shoreline the wilderness it is, limiting development and subdividing would do this.”

“Prevent Eurasian milfoil from entering lake.”

“Have lake owners mind their own business.”

“Ban use of jet skis; restrict ATV’s; limit land use to one unit per 150 feet.”

“Improve fishing.”

“Lower density and no jet skis.”

“Stop over-development.”

“None.”

“Limit amount of buildings on each property and limit high density development.”

“No more variances; no high density developments.”

“Do not change density from one dwelling per 150 feet of lake frontage.”

“Minimum lot size.”

“Don’t know at the present.”

“Stock fish; keep density down.”

“A sandy beach access away from dam.”

“Limit the horsepower of vehicles used on the lake.”

“Limit the number of non-resident (RV users) who use the lake and park their boats at the point where the Eau Claire River enters Middle Eau Claire Lake.”

“Restrict more development.”

“Keep or develop resorts; we all started somewhere.”

“Prohibit jet skiing.”

“Open up access to Lower Eau Claire Lake from the river. The docks from Enchanted Inn have caused stoppage of water flow also their bridge over the river causes difficulty in getting down river and is a problem and danger – people could be deheaded.”

“Lake use for jet ski and water skiing to 10 a.m. to 5 p.m.”

“Control development.”

“I would ban jet skis and high horsepower motors which tear up weed beds, create excessive noise, and destroy the natural peace and serenity of the lake.”

“Limit number of new homes being constructed to one per 150 feet or greater footage.”

“The out of control property taxes; less dense.”

“Water skiing hours to 7 p.m., promote more recreational activities.”

“Stock the lake with some fish. I’m tired of catching nothing.”

“Plant fish; regulate, even close season for longer periods and replenish fish supply: plant fish native to his lake along with some weed control. It is really bad.”

“Keep development limited.”

“Eliminate rusty cray fish; bring back panfish and game fish populations.”

“Enforce banned hours for water skiing and jet skiing.”

“No high density development.”

“To be given the ability to enhance your property.”

“No jet skis. They are noisy. They scare the loons, geese, ducks and other birds and disturb the peace.”

“No campers or trailer houses.”

“Nothing, we have a good lake.”

“Nothing.”

“More fish stocking (walleye).”

“Stock more fish.”

“Make lake a no wake lake and plant more vegetation for fish habitat.”

“Improved roads would help.”

“Change zoning to prevent further density development; strictly enforce zoning regarding key holing; vigorously promote centralized wastewater treatment facility.”

“Better fishing.”

“Eliminate the impact and damage that will occur to all of our lakes when they become infested with milfoil.”

“Better fishing; get rid of invasive cray fish.”

“Limit development density.”

“If I could change it, I would increase the water depth from about 50 feet from shore.”

“Work at keeping the lake clean and clear and not having the amount of algae that blooms.”

“More assistance from State and Federal.”

“Prohibit any and all planned unit development and high to mid density development on the lake and prohibit off-shore developments which have lake access but are not on the lake itself.”

“Decrease densities of camper condo sites at both ends of Lower Eau Claire Lake.”

“Treat to reduce weeds.”

“Nothing.”

“Improved access to the Eau Claire River.”

“Initiate water weed control to get the lake back to condition 30 years ago – i.e., clear with clean sand showing all the way around perimeter.”

“Improve spawning areas.”

“Nothing. I love it just as it is. Just keep the density down.”

“Eliminate the recently installed gravelly quarry that is one mile from lake.”

“Raise the dam so the water level comes up.”

“Less restrictions.”

“Size of motors used on lake.”

“The quality and clarity of the water.”

“Lower water level winter to prevent erosion of lakeshore.”

“Bigger, wilder, deeper bridge to upper and dredge the channels a bit – channels become good fish habitats too.”

“Less people on lake.”

“Scuba dive.”

“Nothing.”

“Water quality.”

“Inspection at boat landings prior to entry and use.”

“Keep it quiet and natural shoreline.”

“Less development on lake.”

“Limit and enforce use of personal watercraft (jet skis) zipping along shore and offer/before hours.”

“Decrease number of boats with large motors and jet skis.”

“Limit use of large speed boats (limit h of motors) and personal watercraft.”

“Peaceful – quiet – we like it the way it is. It’s not broke – do not fix.”

“Closer guarded landings to inspect trailers and boats coming in with foreign weeds and species.”

“Nothing.”

“Slot limits for walleye and reduce limit to one walleye.”

“Better fishing.”

“Better fishing.”

“Decrease the density of development per shoreline and get rid of campground associated with our condo association that are able to use our beach and shoreline.”

“Allow one off lake boat house for lots of 150 feet lake frontage.”

“Don’t know. Enjoy the lake as it is.”

“Stop spearing.”

“Eliminate taverns on the lake, also campgrounds.”

“Keep lake clean’ no high density development.”

“Accept the fact that it is a poor fishing lake and a good water sports lake.”

“Greater restrictions on size and quantity of catch on fishing.”

“I’m not sure what you mean, although recently I’ve heard the gravel/asphalt noise and would like to get rid of that noise.”

“Limited shoreline development (runoff and high density use).”

“No erosion of the shoreline.”

“Higher walleye limits.”

“No jet skis, reduce water skiing hours.”

“Lower sediment and invasive plants and raise fishing (stock better).”

“Property owners being allowed to improve their water frontage including weed control.”

“Being able to make improvements to the beach; more boathouses; weed control.”

“Allow some shoreline management, control of weeds, they are growing too quickly.”

“A better fish stocking program which would lead to a larger bag limit.”

“Reduce brown crawfish population – introduce small mouth bass to eat them.”

“More control of weeds, shoreline erosion, ice damage.”

“Go back to fewer cabins/homes on lake property.”

“Eliminate rusty crayfish.”

“Water quality.”

“Anything that would keep the lakeshore natural and less pollution in the lake.”

“Protect lakeshore and water quality.”

“Stop building – save some shoreline. We had eagles nesting. A home went up and the eagles left. Encourage the loons.”

“Further restrictions on the use of jet skis.”

“Better system for disposal of garbage and trash.”

“Ban jet ski (personal watercraft).”

“Ordinance to tax property buildings over 1000 sq. ft. and additional tax on specialty features – hot tubs, whirlpool baths, anything that puts more chemicals into the environment – too many big mansions and no care about the impact on the small ecosystems here.”

“Nothing but stop the high density development. I think that the more you allow people to congest the land, you are asking for trouble, the peace and quiet is worth millions.”

24. How often do you use the lake to: Response to “Other.”

“Sailing/wind surfing.”

“Cross country ski on lake.”

“Hunting.”

“Ski – cross country.”

“Skiing.”
“Paddle boat.”
“Hunting.”
“Can’t get on water because of bar.”
“Cross country skiing.”
“ATV.”
“Hunting.”
“Jet ski.”
“Cross country skiing and snowshoeing.”
“Windsurfing.”
“Ice skating.”
“Cross country skiing.”
“Skiing.”
“ATV and skiing.”
“Cross country skiing.”
“Hunting.”
“Ice skating/skiing.”
“Sailing.”
“Like to walk on the land and look at trees and sky without noise of ATV’s and jet skis – horrible noise.”

25. Please indicate what you feel is the largest contributor to water quality degradation of the lake. This could be a natural or man-made contributor:

“Outdated septic systems.”
“Poor septic systems.”
“Increased development on the lake.”
“Large boats and jet skis pulling the vegetation off the bottom then that rots and degrades the clarity of the lake.”
“Large hp motors putting a lot of oil in water. Watching a lake shore owner using a weed whip and hitting lake with the string.”
“Development in marginal areas – ie those that are weedy, sedimented.”
“Septic systems by lake shore.”
“PUDs.”
“Large outboards on jet skis break up the algae and other weeds – affect water quality. Spread the greens.”
“Natural cray fish.”
“High usage and lack of septic and runoff control at certain resorts.”
“Old septic systems.”
“Jet skis.”
“Litter.”
“Natural.”
“Rusty cray fish.”
“Mowing/landscaping to the lake.”
“Old Septic system.”
“Septic tank seepage.”
“Too many motors of too great a size for this small lake (90 acres). Septics unchecked and runoff. Rental cabins which allow far too many people to continuously use lake with motors.”
“It is now well controlled.”
“Loss of natural shoreline vegetation.”
“Over use – campers. I worry about fires, but I think they are getting better. My neighbor told me Indian spearing at the time of the year is where the Walleye have not spawned and it is bad for walleye fishing.”
“Not sure.”
“Excess vegetation.”
“Failed or non-compliant septic systems.”
“I don’t believe water quality has been degraded.”
“Fertilizers, boats and motors are getting larger and larger, jet skis.”
“Septic systems.”
“Excess fertilization of watershed and lake.”
“Lawn to the lake/trees cut down to see the lake.”
“Rusty cray fish.”

“Lack of shoreline buffers.”
 “Invasive species.”
 “Grassy leaves and septic.”
 “Over development.”
 “Two cycle motor – boat operation jet skis, runoff from roads.”
 “Increased motorized use from people with no stake or ownership in the lake. Jet skiers use the lake disproportionately to boaters.”
 “It’s doing fine.”
 “Mowing to the shoreline.”
 “Rusty cray fish and other exotic species along with fertilizers.”
 “Septics need to be monitored – fertilizers and pesticides can harm water quality.”
 “Man made runoff.”
 “Failing, outdated septic systems; use of fertilizers; high density development.”
 “The cray fish – spillage of gasoline and other petroleum products from boats.”
 “Perhaps old septic still in use.”
 “Septic systems.”
 “The use of non-ecological motorized engines on lake and in surrounding area.”
 “Shoreline development (all).”
 “Invasion of new undesirable weeds.”
 “We feel the lake has been pretty much the same for the last 10 years – if anything, better fishing and less cray fish.”
 “High phosphorous from runoff.”
 “Don’t know.”
 “For drainage systems like these, it is cultural eutrophication which will less to decreasing water quality. Development needs to be done such that the nutrient loading – especially phos. is kept to a minimum or zero.”
 “Fertilizer.”
 “Farm runoff.”
 “Fertilizers.”
 “Not sure, perhaps sediment runoff from construction.”
 “Growth – development – last few winters have been mild. Need snow cover.”
 “Old septic systems that need to be replaced. Junkyard on Hwy. 27 south of bank may have contaminants that could leak into groundwater and nearby lakes.”
 “Cray fish.”
 “Alien species/rusty cray fish and other vegetative species not natural to this lake.”
 “Septic tanks; personal water craft; lawns; riprap all and on large long waterfront resort areas.”
 “Increasing use and development density.”
 “There isn’t any problem with the lake.”
 “Chemicals and waste that spill into the lake.”
 “Fertilizer and boat traffic.”
 “Septic tank failure – fertilizing on slope to lake.”
 “Large motors.”
 “Jet skiing and water skiing because they don’t follow the 200 foot rule and cause a lot of weeds to be churned up – shoreline erosion.”
 “Fertilizer.”
 “Emissions and leaks from boat motors. Exotic plant introduction.”
 “Large motors and boats.”
 “I think the jet skis and water skier go around and around riling the water.”
 “Fertilizer.”
 “Foreign species; more and larger motors, lawns running down to lakeshore.”
 “Man made.”
 “Phosphorus and fertilizer, and a tighter control of boats entering and leaving the lake. Grass swales is an excellent idea.”
 “Cray fish (crabs).”
 “Large boats and motors.”
 “Increased use of the lake by powers boats; increase in the amount and intensity of the sun.”
 “Lawn runoff, old boat motors with oil and gas discharge, too many septic systems.”
 “Boat and jet skiing to close to shore. No enforcement of boat regulations.”
 “Garbage from boats.”
 “Large power boats; jet skiing.”
 “Eurasian Water Milfoil and property owners unmindful of the natural habitat.”

“Motorboats.”
“Motorized boats, etc.”
“Runoff.”
“Fertilizers/pesticides.”
“Exotic plants and fertilizers.”
“New construction.”
“Motor boats and fertilizers and septic tanks.”
“Jet ski and boat traffic.”
“Boats stirring up the muck.”
“Low water level.”
“Failing septic systems/erosion.”
“Septic systems all should be holding tanks that are dumped out.”
“Poor septic systems and fertilizers runoff.”
“Oil and gas from either burned or spilled into water also mercury from whatever source.”
“Lack of rainfall and snow and unusually hot weather.”
“Septic and outboard motors.”
“Don’t know enough about it to give an opinion.”
“Septic systems not functioning properly or residents running grey water onto the ground.”
“Sediment filling in the lake.”
“Global warming.”
“Runoff into Upper and Middle from lake homes with no vegetative buffer.”
“Jet skiing; large wakes from big boats.”
“Fertilization.”
“Lawns and fertilizers.”
“Over-fished; careless boaters, jet skiers.”
“Lawns mowed to the water.”
“Overuse.”
“Not certain.”
“Fertilizers; lowering of water table (man made).”
“All septic systems updated.”
“Boats contaminated with Eurasian Milfoil.”
“Fear too many owners, but lake is usually quiet so many are not present at same time.”
“Nitrate due to runoff of fertilizer and clippings from lawns and from upstream farms.”
“Excessive plant growth.”
“Big boats and jet skis ruining shoreline. All lakes age – it is a fact of life.”
“Too many houses that do not have up-to-date septic systems.”
“Water level too low – controlled by dam.”
“Use of the lake by man.”
“Shoreline development coupled with boat wakes.”
“Runoff and stirring up by jet skis and other high speed craft.”
“Maintaining lawns to shoreline especially with fertilizer.”
“Fertilizers.”
“Faulty sewers.”
“Runoff.”
“Motorized watercraft.”
“Don’t know.”
“Motorcraft erosion of shoreline.”
“Don’t know.”
“Craw fish.”
“Runoff.”
“It is just fine as it is.”
“Fertilizers on lawns and gardens running or seeping into lake.”
“Boats – ski jets – too big of motors.”
“Increasing emergent vegetation due to human activity.”
“General pollution by lake users – little, garbage, fluids, fish and game guts, etc.”
“Cray fish and chemicals.”
“Not enough natural buffers on lakeshore.”
“Recreational boating.”
“Motorized rec. equipment, i.e. boats/jet skis.”

“Lawn fertilizer, over development of shoreline.”
“Leaking septic systems/lawn fertilizers.”
“Everything that occurs in the entire watershed ahead of the lower lake (we are at the end of the line).”
“Septic systems that are not working properly.”
“No degradation of water since I’ve been here – 30 years.”
“Septic systems.”
“High density dwelling sites, i.e. trailer parts/condominiums.”
“Runoff carrying nutrients.”
“Fuzz from trees and plants.”
“Campground at river entrance to lakes. Rusty cray fish.”
“High density development.”
“Weeds and silt.”
“Increase of big power boats.”
“My guess is what people throw into the lake. Also older homes have septic systems too close to the lake much change septic location.”
“Additional developed shoreline – improper shore maintenance.”
“The low water levels of pollution from the lakes flowing into it.”
“Invasion of crabs.”
“Don’t know.”
“New development – lawn chemicals.”
“Head Lake (spring fed) – natural flow of water.”
“Motor boats.”
“Boat traffic.”
“Shoreline buffer not equally enforced.”
“Chemical pollution from runoff and boat motors.”
“Public access.”
“Two stroke motors, septic systems, fertilizers, cray fish.”
“Lack of rain, hot summers, warm winters, affect watershed, lake quality, not degrading.”
“Ice break-ups causes shoreline problems.”
“Fertilizer runoff.”
“Boats churning up lake.”
“Don’t know.”
“Fertilizers and pesticides.”
“Year round residences which have increased overall border on the lakes.”
“Lawn care chemicals.”
“Weed transfer from boaters, fertilizer, grass at lakeshore (fertilizer and mowing) and possible (I hope not), but outdated and poorly designed septic systems.”
“Septic/fertilizer seepage.”
“Two stroke outboard motors.”
“Boats roaring around – jet skis.”
“High density housing.”
“The lake needs to be dredged.”
“Rustican crayfish destruction of fish habitat.”
“Septic system to be in compliance.”
“We don’t feel that there is degradation. However, lack of rain is preventing a natural flushing of the lake.”
“Fertilizers.”
“High density development; runoff from mowed shorelands; uninformed, uneducated government leaders making decisions.”
“Sewers, grass clipping, lawn fertilizer; using lake as a giant bathroom.”
“Big motors.”
“Don’t know.”
“I am not aware of any degradation, but feel that invasive plants potentially could.”
“Garbage in the lake; cray fish in the lake.”
“We really don’t know.”
“High density on the lake; lawns.”
“Mowing to water’s edge.”
“Uncontrolled building, fertilizers.”
“Power boats (outboard/inboard motors).”
“Lawn clippings, fertilizer.”

“Crawdads.”
“High density developments, non-property owners.”
“Runoff from improper shoreline vegetation; fertilizers and septic waste.”
“Excessive use of lawn fertilizer; global warming (water is green this year); failing septic systems.”
“Jet ski.”
“Septic systems or lack thereof.”
“Surface weeds cut up by boats/traffic floating on surface.”
“Phosphates entering surface water and groundwater via bad septic systems, fertilizers, and excessive runoff.”
“Clearing of natural vegetation along shoreline.”
“Septic systems that are antiquated and below current guidelines.”
“Overuse of motors, noise and gas pollution, oil slicks on the lake; jerks harassing the loons.”
“Too many lawns at edge of lake; too many big motors.”
“Failed septic – feeding wild geese.”
“Population density.”
“Put in cribs.”
“Runoff.”
“Surface water runoff; raking leaves and grass clippings into the lake.”
“Rusty cray fish.”
“Old septic systems.”
“The introduction of invasive species of plants and animals.”
“Development and power boats/jet skis.”
“Fuel pollution from jet skis (proved by research in other states). People throwing litter in lake. Bringing in exotic species on boats.”
“Cray fish.”
“Phosphorous – base soap and fertilizers – lawn chemicals – more than one unit per 150 feet.”
“Cigarette butts and trash.”
“High density of homes.”
“High usage of motorized boats (gas – oil leaking.)
“Too many watercraft; old unenforced septic systems.”
“More homes, especially year around, on the lake.”
“Fertilizer; over building.”
“Two cycle outboard motors.”
“Littering and unclean boat bottoms and from older cabins too close to lake.”
“Natural.”
“Lowering the water level by allowing more water out at Moony dam.”
“Chemicals that come into lake causing murkiness.”
“Development.”
“Dirty trailers (weeds).”
“Fertilizers and pesticides by adjacent lake property; failure to have a gas station on lake causes lots of do-it-yourselfers to spill outboard fuel in lake.”
“Construction of docks prevents water from flowing naturally down river – obstruction of watershed flow.”
“Boats from other lakes and visitors who do not have an investment in property.”
“Runoff.”
“Rusty cray fish.”
“Jet craft – Birch in a shallow spawnly bed. Its weed beds and bottom are being destroyed by hot doggers. This should be a slow wake lake.”
“Fertilizers, cray fish dumped in our lake by the DNR for the purpose of selling.”
“Cray fish and snails.”
“Too many lawns add fertilizers.”
“Motor boats losing gas in the water.”
“Growth of weeds.”
“The development in excess of what the natural lake system can manage.”
“Algae.”
“Rusty cray fish.”
“Dragonowski’s Campground – too many people too close to the lake.”
“Runoff from homes and driveways.”
“Lawn fertilizers, poor septics, neighbors with no environmental concern who bathe in the lake with soaps.”
“Too many people.”
“Over development and destruction; waterfront vegetation.”

“Over development. In the future I worry about milfoil infestation.”
“Not sure.”
“Do not know.”
“Chemicals.”
“People in general.”
“Jet ski use.”
“Septic systems, particularly as more dwellings are allowed. Ultimately this density development with no water treatment plan will be the end of the lake as we have known it.”
“Introduction of milfoil or algae from boats.”
“Water skiing and jet skis rip up the plants on the bottom because lake is shallow.”
“Runoff of any kind into the lakes and the increase of aquatic plants.”
“Cray fish – invasive species.”
“Development.”
“I don’t know.”
“Phosphates in the lake.”
“Over use and under assistance.”
“The water clarity is worse now than 10 years ago, but there is not an obvious reason as to the cause.”
“Lack of natural shoreline buffers.”
“The addition of phosphates from septic tanks and fertilizers.”
“Warmer summers/inflow from Sweet Lake causing more weeds down lake from river outlet into lake.”
“Jet skis and large boats and motors.”
“Large homes on the lake with their manicured lawns.”
“Increased geese population.”
“Submerged and emergent weeds.”
“Septic systems that are not inspected on a regular basis.”
“Boaters from other lakes.”
“Amount of debris at bottom of the lake; lack of waterway channel to dam.”
“Motorized traffic – large natural storms.”
“Possibly the fertilizers being used. Also the large amount of geese that live on the lake.”
“Chemicals – fertilizer. High density housing.”
“Carelessness of boaters, trash thrown in lake.”
“I know on Robinson there are drain pipes from dirty water uses from home sinks and washing machines. Boat props speeding by shoreline. Two cycle engines.”
“Bad septic systems. Again, this is opinion – what are you doing scientifically?”
“Allowing milfoil to grow. Allowing boats from other lakes access.”
“No idea.”
“Campground usage; non-enforcement of zoning rules for all.”
“Use of fertilizers tied with developing right to the water’s edge.”
“Density of property owners, no emphasis on vegetation barriers, use of fertilizer, motor vehicles on lake.”
“Probably the combinations of things draining into the lake(s).”
“Lack of shoreland buffers (lawns mowed down to the lake.”
“Water looks pretty good all year.”
“Lack of consistent and sufficient snow fall – rainfall to adequately recharge the watershed due to down river (St. Croix, Mississippi); irrigation.”
“There has been a decrease in crayfish population and an increase in weeds and poor water quality as a result in no cray fish (no more trapping cray fish.”
“Geese and ducks.”
“High density boating by non-lake users, i.e. resorts, day users.”
“we reside on the north shore – we get a lot of floating garbage on our shoreline and we notice a lot more floating aquatic plants and cray fish.”
“Lack of natural plants for shoreland buffer.”
“Acid rain and large amount of weed that are growing in channels that connect the lake.”
“Lawn fertilizer.”
“Lawns with no barrier, but there aren’t many owners that do that. Maybe inadequate septic.”
“Old septic systems.”
“Boats stirring up the water and mud.”
“Fertilizers.”
“Here again, opinions mean nothing – how should I know?”
“Too much fishing and recreation pressure on the lake.”

“Runoff from development (grey water, fertilizer).”
 “Jet skis, motored boats, often have to run outside to yell at boaters speed coming up river – they cause destructive wakes.”
 “Runoff and cut lake weeds.”
 “Cray fish.”
 “Natural sedimentation from vegetation.”
 “Weeds that are out of control.”
 “This year I think the worm/hot temps had an effect on algae/weed growth.”
 “Erosion.”
 “Sand shoreline allows nutrient to enter the lake. Should have 200 feet of distance from lake for septic systems.”
 “Septic systems.”
 “Development and lowering of lake level from 50 years ago.”
 “Rusty crayfish.”
 “Phos. based fertilizer and runoff.”
 “Probably the increase in boat traffic and petroleum pollution resulting.”
 “Power boating – over population.”
 “Crayfish – high power boats.”
 “Waste seepage into lake.”
 “Plant barriers should be recreated at shorelines. New owners have been cutting – old removed years earlier.”
 “Too many large boats and motors – wave runners. None respect lake.”
 “Large mansions and over development on those properties = more noise chemical pollution. Too many motorized vehicles on the lakes = too much horsepower in motors.”
 “Allowing people to clear away all the trees and brush down to the lakeshore.”

26. From the list below, please indicate which actions you would support as a way to help improve water quality of the lake. Response to “Other ideas.”

“Test septic systems.”
 “Property owner doing as they please and not always doing the right things.”
 “Inspect and ensure septic systems are in compliance.”
 “Totally eliminate as much as possible. Red cray fish.”
 “H should be part of our high taxes.”
 “Get rid of invasive species, ie rusty cray fish.”
 “Reject condo developments on Eau Claire Lakes.”
 “Ban jet skis.”
 “Work with Douglas County to lower lake level in Lower Eau Claire for winter to reduce the damage.”
 “These are all very sound suggestions, but you must remember to respect others rights to privacy and share the lake.”
 “Limit the maximum horsepower of boats and ban jet skis to reduce shoreline erosion and noise pollution. Mandate a septic system testing program for all lake residents. Examine other potential lake and groundwater contaminants such as junkyard on Hwy. 27.”
 “Fines for violations of zoning and water safety.”
 “Boat inspection at landings over holidays done by property owners.”
 “We need to determine if the water quality is dropping and then why its dropping before we try to solve the problem.”
 “Poison area lakes with Milfoil? Stop spread somehow.”
 “Federal expense because of Airborne toxic spills that have had tax already paid by polluter.”
 “Ban jet skiing; increase no wake zones.”
 “Be an advocate and approach government.”
 “Hold a board to the dam.”
 “Leave it alone.”
 “Clean grass from shoreline for swimming.”
 “My 600% increase in property taxes should do that.”
 “Monitor control of lake level at Mooney Dam.”
 “Direct some of the high tax dollars to lake improvement.”
 “Provide information on what kind of plants or materials could be used to prevent erosion.”
 “None of the above.”
 “Septic systems checked every 5 years.”

“Moratorium on keeping fish. All fish catch and release also fines and imprisonment for serious offenders such as appliances and tires dumped into lake.”
 “How can you enforce these rules with non-resident users.”
 “More restrictive panfish bag limits. Restore/replace fish habitat lost to rusty cray fish.”
 “Control local lake issues at local level, not county.”
 “Support minimal usage to one property owners.”
 “Zone the lake property. Make the lake a quiet lake or wake free lake. Make sure no multi-living units are built.”
 “Have fund raisers for lake project.”
 “Ban jet skis.”
 “No more variances.”
 “Do not permit planned unit developments on the lake.”
 “Address issues caused by businesses such as the water flow problem out of the river into Lower Eau Claire River.”
 “Explore rusty cray fish eradication programs.”
 “Should be part of the already too high taxes.”
 “Enact zoning that protects lake quality and enforce it.”
 “Our taxes should already support active involvement.”
 “Limit jet ski/ski hours and size of motors.”
 “Geese population management.”
 “Everyone around the lake be informed about the lake. All property owners.”
 “Encourage a large harvest of geese.”
 “Let everyone know today that in 20 years 2-cycle engines are banned. Decrease the pines – too much pine pollen in lake. One of Gene Farhners biggest complaints since early 1900s when there were not so many pines.”
 “Scientific analysis of lake water over time.”
 “Any program to keep it as is.”
 “Limit use of motorized watercraft – I know it will never happen, but I would support it.”
 “Zoning changes to mandate 150 feet min. frontage/dwelling (Class I) and 200 feet min. frontage/dwelling (Class II); slow no wake areas to protect bays and shoreline.”
 “Encourage non-owners to have a respect and responsibility for the lake as the owners (of lake property) have.”
 “Form lakeshore task forces/committees to help all of the above.”
 “Retaining walls of solid materials to control erosion and improve the aesthetics of the property.”
 “All of the above.”
 “If ordinances are passes and enforced.”

38. Additional Comments:

“Better quality stocking of fingerling – not fry walleye. Stock of S.M. bass to control red cray fish population.”
 “Birch Lake should be a no wake lake. It only takes minutes to cross it. There is a lot of silt on bottom and it should not be disturbed. The lakes are really a nice body of water, but they are going to have to be taken care of. It is people living with property on the lakes that are tearing them up. Thanks for the survey.”
 “No high density development. Thank you.”
 “Keep Pickerel Lake on your surveys. Get that 10-6:00 p.m. water sport time of operation back to its original 10:00 a.m. – 5:00 p.m. The majority of people have been in favor of 10:00 a.m. – 5:00 p.m., but the Town of Barnes (Board) have stuck this in, then have refused to change it back to 10:00 a.m. – 5:00 p.m.!! Do more to inform people of just how important it is to keep our lakes and lands unpolluted to pass the stewardship to our young and next generation. Encourage catch and release. Go out and meet with people in person – where is your welcoming committee.”
 “I do believe we have the best lake in the area. It is very closely monitored – shore lines are very good.”
 “I do not fish. My husband was an avid fisherman and we had a resort where we always informed our guests of rules and regulations of the lake and we also included some of our own. I am too old to be of any use in activities with the lake, but I do want to do whatever is needed to keep our lake clear and clean – fishing good – wanting everyone who owns on the lake to take excellent care of what we have an to keep it like we found it. It is a wonderful area. we have an awfully lot of 4-wheelers young and too young and older who use the roads as a race track. We need our rules for safety of all. My sons do not live here. I joined because I thought they lived here as youngsters and they loved it. So they will help to keep it clear and clean for everyone too. We also need spearing limited to this time of year – fall – when the walleyes go up the river to spawn.”
 “I hope the septic systems on the lake watershed area can be inspected and made to be in compliance with current regulations with no grandfathering of existing systems. I believe this is the biggest issue with keeping or improving the water quality.”

“Regarding the question regarding a maximum mp and type of motor used, it is not the size of the engine – it’s the safe driving of the boater, even a fishing boat with a 5 hp outboard.”

“Ban water skiing – jet skis. Remove ¾’s of houses/cottages on lake. Enforce a no lawn within 50 feet of lake shore rule. Stop further building within 200 feet of shore lines. Have everyone take care of their own property. Don’t bother me.”

“Thank you.”

“We greatly enjoyed Cedar Corporation’s presentation at the property owner’s association. I wish we could have had a personal detailed report. It’s too much to remember in such a short time. The presenter did a great job. I was highly impressed, especially when he talked about water temps and dissolved oxygen levels which is what I collect along with phosphorous and chlorophyll samples for the State Lab in Madison. One last thing I wish to emphasize. Rules and regulations are worthless unless they are enforced.”

“Have had the property since 1970. Have witnessed a decline in fishery. In 1970’s to early 80’s, Middle and Bony had a wide variety and plentiful amounts of aquatic weed such as coontail, American milfoil, cabbage/lily pads, etc. Weeds provide habitat and food for young fish remove habitat no fish. Noticed cray fish in 80’s plus floating weeds everywhere. Within 5 years, weed beds are gone. No longer catch or see panfish. No spawning beds either. Northern Pike, musky decline. Young ore need weedy habitat, walleye decline. Large mouth bass decline. Only small mouth bass increase. They are main predator of rusty cray fish. The only weed left are isolated patches of brown cabbage in extreme shallow water. Fish do not seem to like them. Bony and Middle used to have weed lines as deep as 16 feet. DNR fish trap studies back this up. So far, this green off of our dock we have trapped and killed or ate over 300 rusty cray fish. The cray fish have also killed off the lily pads in Bony.”

“Again, if there’s going to be an ordinance to restrict use by certain people from 1-5, why isn’t it enforced? If it’s not – get rid of it. I worry about the growing problems about weeds washing up on our beach, especially in the fall. We hauled tons of it out of the water last year.”

“The greatest risk to the beauty, appeal and environmental quality is our development.”

“Eau Claire River watershed is extremely unique, and should be conserved and protected for its naturally beauty and value to the environment of northwest Wisconsin.”

“Education of lakeshore owners is very important. They need to know why mowing to the water line is not good for water quality. They need to know that woody vegetation/windfalls in the lake are good habitat. Demonstration of BMPs at selected sites would help lakeshore owners know what to do.”

“Question #32 appears to forget that some of the lakes in the Eau Claire chain and in Town of Gordon.”

“Lake quality needs to be maintained as this is what can help keep property values strong. The water quality attracts higher income buyers.”

“Re: q. #17, education is more effective than the threat of enforcement which is unlikely anyway. Bayfield County and local government should work with property owners to preserve and improve lakeshore restoration. Vilas County is a current excellent example of cooperation between City, DNR, and property owners. Re: q. #22, the Property Association could send a mailing or include in tax statements a list of strong suggestions as to lakeshore care and restoration. Re: q. #19, I think every residence should be required to have a current septic system or a deadline to have one installed with possible financial assistance from the State. Applies to lakeshore residents. Let common sense dictate however and not a state law originating in Madison.”

“Yes, the lake needs to be monitored and cared for however this must not be intrusive into people’s lives or make it difficult for them to maintain their property. Also, the protection should not exclude others from enjoying the lakes. We should strike a harmony of carefree and sharing what God has blessed us with. Every lake should be able to have one or two lodges of multi-living establishments – moderate to the size of the lake – because the area does need tourism for the local economy. Septic tanks can be aeration – this would help with that problem – or concern. Any such establishments should post requirements for using the lake and provide their own security person or bouncer to oversee that folks abide by the lake requirements.”

“This year for the first time we have experienced dead fish washing up on our shore. Also, the motors catch the natural vegetation growing at the bottom of the lakes necessary for fish habitat and pull them up. This year we have a 6 foot area along our entire shoreline of washed up vegetation – the most we have experienced.”

“Do you realize we are the only town in WI that restricts water skiing, tubing and personal watercraft use?”

“Growth will be the greatest potential threat to water quality. Four units per 150’ of frontage is a very large threat. Water quality degradation can be slowed, but it is very difficult to return. Too many nutrients, esp. phos., will result in rather rapid reduction of water quality. Development needs to be balanced with protection or the very characteristics which users find desirable will quickly go south.”

“We only have a cabin in the eastern edge of Barnes township. We use more lakes in the Drummond area. Therefore, we cannot answer the questions truthfully.”

“The lake is a great resource. The limited water skiing hours hurts this resource.”

“Exotics is the one thing that really worries me – more might be done to harm boat owners or transport. I see more signs in MN. A fair amount of bottom growth in our area – not algae I guess – doesn’t seem worse, but not sure how natural it is either.”

“My property is located on the southeast end where there has been an increase of various vegetation – lily pads, pickerel weed, muck. It becomes more difficult every year to access lake by boat or person.”

“RE: old septic systems: This survey has called attention to many factors affecting the quality of Eau Claire Lakes. However, a major factor that needs to be addressed are old septic systems that may be leaking contaminants into ground and lake water. New septic systems must be pumped every three years by law; there appears to be no law that governs old systems. Please work toward legislation (town, county and state) that mandates periodic testing of all systems, especially those around and near lakes. That is a bigger, more important factor than the efforts preventing “high density development.”

“the ordinance that requires individuals that get a variance to make property improvements to adhere to a shoreline buffer zone is not fair when others that get a permit without going through a variance are not required to do the same. The shorelines can best be protected with appropriate riprap rather than alders, brush, reeds, weeds, etc.”

“PWC are out of control – DNR regulations are constantly ignored (ban them). Limit max. horsepower type of boat on our lakes. Lower Eau Claire. I believe the Forestry Dept. controls the dam at the south end of lake. They should lower the water level during the winter and raise it during the summer. Current practice of doing nothing causes soil and vegetation erosion on lakeshore following winter break-up.”

“Tax write-off for planting trees. Lower property tax for empty frontage. More education for resort owners on boat wakes and water (boating) courtesy. Riprap frontage and lawns to water edge. Fewer deep weedless spots in the bays – more weeds in all the bays (now than 20 – 3- years ago).”

“A lot of people today are building apartments on top of garage. Thence forth two developer per 150 feet. I would like to see less density on small lots. Some are ten feet from our property lines.”

“There must be a consulting firm closer to the region in question than the almighty Cedar Corporation. They are a consulting firm that only deals with matters in their best interest.”

“The walleye fishing is getting worse every year.”

“Thanks.”

“The bridge where the lock is on South Shore Road. The Town should be involved to correct the runoff to the river leading into the lake. I also feel that lower receives pollutants from Upper Middle Lake and the surrounding smaller lakes.”

“Current lake restrictions are killing property values. Fishermen need to be told they don’t own the lake – many are drunken slobs.”

“We are in the Town of Gordon – the Association seems to be most concerned with Barnes – the questionnaire is a good example – Gordon doesn’t seem to exist.”

“My perception is that the large property owners and those who own large tracts tend to be the entities who receive preferential treatment from local authorities. An example is allowing the new boathouses on Upper Eau Claire that are right at the water’s edge on the properties that used to be the campground even though there is supposedly an ordinance prohibiting this.”

“We appreciate everything the POA is doing for the environment and our lakes. We must be vigilant or we will lose our children and grandchildren’s inheritance. Keep up the good work on behalf of them (and us).”

“As a property owner, I don’t like being told how to use my property especially by someone who is not a property owner in the area.”

“Why are there two associations – you and Eau Claire Lakes Conservation? Can’t you combine your efforts with one fee?”

“Thank you for conducting this survey.”

“We both appreciate and value the time we get to spend in Barnes. In approximately 7-8 years, my husband and I will retire and plan to be more active in preserving the uniqueness of the area.”

“I enjoy the beautiful lake.”

“The small town and quiet lakes are what we come to Barnes for. We don’t want it to grow. I suppose this is impossible, but if it gets much bigger and more populated, it will lose the charm to us. The ATV and snowmobiling also keep us in this town.”

“The closing down of resorts has made an increase in camping trailers in several areas. These trailers are parked all year long and increase the fishing pressure, etc. on the lake which we don’t believe is good. Most of these trailers are eye sores to the community and we would assume don’t contribute much to the tax base, thus less money for important projects to improve the lake.”

“Haven’t been able to use the lake since 97 or 98 when Moony dam was rebuilt. That was when the sand bar began expanding.”

“I truly loved the upper and surrounding lakes. Overall, I think it is one of the most beautiful and serene places in the whole Midwest Region. I think it’s crucial we all work hard to keep it that way.”

“Past few years, water lilies are growing at our end of lake. Never had any before. Is the lake changing. Real mucky bottom, can’t swim, so don’t think taxes should be so high.”

"We have not lived here long enough to answer some of these questions. I would say preventing Milfoil would be the biggest concern."

"Generally you are doing a good job. I have liked the past talks/lectures at the breakfasts. They work well for me. They have changed my view of things. Thanks."

"Your survey questions are aligned and composed to create problems that do not exist. Also, we should live with the hours and restrictions now provided for boating, water skiing, jet skiing, etc. by the State Statutes and not town or lake association ordinances. Thank you for allowing me."

"I think the zoning restrictions are ridiculous to a point. We have 265 feet of shoreline that is undeveloped which we intend to leave that way, plus we have nearly 2 acres worth of wilderness between our cabin and the lakeshore and we can't even put a small gazebo up down by the lake. Well, 35 feet in from the shoreline. I fully understand why they are there, but when you have someone who is conscientious of the needs of the lake and natural surroundings, there are extremes."

"Question #20 shocked me. The present rules allow four dwelling units per 150 feet? I think that needs to be changed quickly to preserve the present character of the Barnes area to reduce the rule to one dwelling unit per 150 feet."

"I love Upper Eau Claire Lake and plan to retire there."

"The Eau Claire Lakes currently have the most restrictive rules for boating and personal watercraft in northwest Wisconsin. We have a lake that is poor fishing and you can't water ski on it after 6 p.m. I own a pontoon, but there should be more use allowed than this (pontooning after 6). I have fished my entire life. The Eau Claire Lakes are some of the poorest fishing anywhere. People are all concerned about water skiing and jet skis, but they are all breaking the rules on lawns, shore land development, etc. and nothing is being enforced. People keep over their limit of fish and undersize fish with near zero enforcement. We need to enforce the rules we have before we make more. The 6 p.m. water ski hour is a good thing, much better than 5 p.m. Also, the proposed panfish and bass limits are a good idea."

"Non-residents owning property and paying the same taxes should at least be able to defer the non-resident amount of license fees to their local lake association. Improved communication may be able to get increased funds from those concerned about the area."

"Please control winter recreators from accessing property of others via the frozen lake. It appears that there is a trail across my property."

"Enforce a no-wake on Robinson Lake and the water quality would improve over time."

"Too long a survey."

"Our family has owned our Bony Lake property since 1923. It is a very special place now being enjoyed by a 4th generation of our family. Improving and monitoring the quality of the environment on Bony Lake and the other Eau Claire Lakes is very important to us."

"I have personally put up loon signs and landings and channels "slow" no wake buoys and information packets on every dock on upper Eau Claire, Smith and Shunnenberg Lakes."

"I really appreciate your efforts to maintain and improve this special area. The relative lack of development on the lakes is an enormous asset. Some do not fully appreciate as is the water quality. Many areas have lost these qualities. Let's make sure we do not. We have a good balance of usage of the lakes today."

"As stated above, we would like to take steps to restore our shoreline buffer and plant native tree species on our property. The only thing that has prevented us from doing so to date is not knowing who to call. If the Eau Claire Lakes Property Owner's Association could provide a list of resources or guidelines with respect to proper restoration, that would be very helpful. As lakeshore owners, nothing will affect our property values more than the quality of the lake and its shoreline. We should all be willing to do our part to improve it – including paying for it."

"Counties and townships need to work together more closely. More funding for DNR. More public education about protecting and caring for our lakes, rivers, wetlands and watersheds. UW-Extension assistance with writing and obtaining grants for lake associations."

"I would love to volunteer for LPO, except I believe they are against motorsports type run which is the reason we are there in the first place."

"I think the restrictions on water skiing and personal water craft are unfair. I am originally from west central Minnesota and they have no such restrictions. The fisherman/fisherwomen and recreational water sport users co-exist quite well. Also in the past 5 years or so, personal water drafts have gotten much quiet than they were years ago. To put the shoe on the other foot, how would the fishing crowd like it if there was a restriction on when they could fish. By the way, my family also likes to fish. Please feel free to contact me."

"I don't like the undertone of this survey. I think the environment around here accommodates most people's interests. I suspect (and I admit to being paranoid) this survey is looking for issues to pursue that maybe don't need to be chased; looking for problems that aren't really needing to be fixed. I hope I am being too suspicious. I am also having a problem with what seems to be a melding of the interest of the Town of Barnes with those of the Eau Claire Lakes Property Owners and/or the Conservation Club and their Board of Directors have decided to use the funds for this survey that is one thing. If it comes from the Town of Barnes and is being paid for from tax dollars mandated by law from me that is another."

“When I bought property on this lake in 1983, it was a hub of activity. The fishing was great and there were always several boats on the lake. It is dead now in all of the above uses. Even pontoon boats are not having trouble getting into the lake. The fish are mostly gone. Used to see muskies all the time. Have not seen one for three years. No crappies, no walleyes, no blue gills as one resident pulled out all the bull rushes where they used to spawn. Weed cover is down by 75% and even the lily pads are mostly gone. It is all very sad.”

“Control jet skis and high power boats. Enforce the laws that are on the books now. Be sure out of state people obey these ordinances and laws and if not, arrest them – all they get now is a slap on the wrist and let go to do it over again.”

“I believe the POA should actively pursue adoption of zoning rules by the Town of Barnes to eliminate PUD high density development plans allowed by Bayfield County.”

“Most lake property owners have done a great job of maintaining their shorelines. Give them support and continued flexibility to improve as they see fit – after all, they are paying dearly for it with extremely high tax dollars. Force the Town of Barnes to use our high tax dollars to help pay for necessary lake quality improvements. Consider a launch fee for all non-lake property owner lake users and use those funds to support necessary improvements.”

“We love this lake area. We believe that its biggest strength is its restful nature. This should be preserved by controlling number of residents and presence/use of jet skis.”

“I would like to know about the highest priority needs are and how donations or fund raising could help.”

“I no longer live in Barnes, even though I still own 5 acres on Call of the Wild Road.”

“Rumor has it that the jet ski hours have been expanded in Eau Claire Lakes. Is this true? Was there any public meetings for input?”

“I value the attention given to the issue of water quality/resource usage and support efforts to maintain and improve the quality.”

“I thought the DNR was responsible for testing fish levels and water quality.”

“My impression of the association is its prime purpose is to promote landowners, limit development, restrict use. I formed this opinion when Sundance Campground started in the early 80’s and the association was formed. Sundance gave thousands of kids the opportunity to enjoy this creation of God’s. It did no hard to the lake. The lake water quality is great and has remained so since I purchased my home here in 1976 and I would oppose any further restrictions on its use other than restricting walleye spearing in April.”

“Too much regulation can foster ill will among property owners and diminish neighborly atmosphere. Restrictions and regulations should only be enacted and enforced when an overwhelming majority of owners welcome such action.”

“Go Packers!”

“Thank you. I’ve been thinking about what I can be effective doing. Helping with a summer project? Sometimes I spend fall time at the cottage on Lower Eau Claire. I would like a summer meeting where knowledgeable people share how to handle runoff.”

“This area has a specific quality. It is not commercialized like Hayward. My father has been coming to this area for over 60 years. It has maintained its beauty. However, the fish population has dwindled. Is it because of over fishing and the DNR not yearly restocking all lakes or is it the water quality not being able to sustain these fish. I was told the logging industry threw sawdust into the lakes by the tons which accounts for the muck. Because of the fact I live on Pickeral Lake and just because it does not connect to the others, it lets no attention whatsoever. That is why each lake should have its own association – so that proper funding and my membership donations go to my lake. By the way, Wisconsin was listed on TV by EDA as one of the worst lake states. Lakes with bad water and Vermont was best. For your information, approximately three weeks ago, Good Morning America had a series on family vacation. This particular series was on best and worst lakes in the USA. What aired really made me sick. Wisconsin was listed as having some of the worst water quality lakes in the Country. Vermont and Maine the best. Do you realize that that does to the tourist trade as well as homeowners that put a priority on water quality. I recently built a \$200,000 log home and am now debating on building in a different state such as Vermont. I would suggest the association log on to see what the best lake states are doing right. This should help you. #18 will give you an idea on how little the Dept. of Natural Resources helps the lakeshore owners. They allowed Dahlberg Electric to cut a 30 foot wide piece of natural vegetation from my steep slope to the water because of a service wire that runs across the lake. Instead of having the service wire relocated or stopping this procedure on lakeshore land, these buffoons butchered my land and DNR did nothing. Frankly, I don’t care about the safety of their staff. If some asshole is dumb enough to pick up a live wire, so be it. That is not justification to run rampant on private property and damage this land.”

“I have been coming to this area for over 20 years now, enjoying the peace and quiet and the wonderfully clean waters. This watershed is unique and fragile. Half a foot of topsoil over a thin layer of gravel and then sugar sand. Ideal land for filtering water and growing trees. Not ideal for heavy use. Trampled, torn up vegetation takes a long time to recover. I have observed increasing erosion problems in the last 10 years due to non-stop year round use of the land. Snowmobile in winter. ATV’s the rest of the year. There is no chance for the land to heal under these conditions, and every year it gets worse. Everyone knows that overuse leads to decline. Over development around many of the lakes is leading to the subsequent decline in the water quality of those lakes. The very qualities that give Eau Claire lakes their appeal will be gone 20-30-50 years from now if we don’t plan ahead. The trouble is – most land use plans are cursed with shortsightedness. In my view, a 3 point plan – limit – educate – compensate – is called for. Limit development to sustainable levels. Increase

awareness of the problems by educating the people (and I mean all the people who use the lakes and land). Give landowners options/incentives (compensation) to preserve their land instead of developing it. The Eau Claire Chain of Lakes community could set a fine example of how to protect and enjoy our precious natural resources. Carpe Diem.”

“Thank you.”

“I have seen many instances of checking for fishing licenses and fish kept but little or no times that limitation on boating and jet ski are being enforced.”

“During summer, skiing hours need to be extended to 7 p.m. to allow skiing without interference from pwc’s. ATV activity needs to be curtailed in town areas.”

“Am too old to do much physical work, but would be willing to donate cash.”

“No big development like condo’s and such.”

“Would like to see water skiing and jet skis off of shallower lakes like Birch that have access to deeper lakes. Signs would need to be posted at the channels since no one looks at the landing. The sediment build-up is increasing. It used to be when we went swimming the sediment on sand would wash away, now after one week it is one inch deep.”

“The Barnes/Eau Claire Lake Property Owners Association are doing a fantastic job. The officers are very dedicated to do an excellent job to improve the quality of the surrounding lakes. They work very hard.”

“We would be willing to help with Hwy. 27 roadside clean-up a couple of times each year.”

“Got this after we sold our cabin, but thought you’d want the input.”

“Sons Perry, Wayne and Bruce will be spending summers at the lake. Wayne has worked for Round Lake Maine for some years. Perry and Bruce expressed interest in volunteering for landing control.”

“When the Barnes/Eau Claire Lake Property Owners Association lets everyone that owns land, then they might be a joinable club. They are or are perceived to be better than everyone.”

“In the decades we have been coming to the Eau Claire Lakes, we have seen a marked reduction in the use of our greatest resource – the lakes. Activity on the water is down markedly on Bay/Middle and Pickeral which are three lakes we are associated with. The lakes are not being restocked and because of the fishing burden, the days of a large catch are gone.”

“I believe the water skiing hours are very unfair. These people should be able to use the lake just like all others at daylight hours any time. What stops someone from driving a large boat at any time? What difference does it make if there is a skier on the back? It seems like the fishermen are being given priority – they can fish year round while water skiing is a short season. A very outdated and stupid rule.”

“Keep each area on lakeshore drive (upper Eau Claire) clean.”

“I’m 62 years old, have had three heart attacks, so I can’t do much to help, but it’s a shame about all the silt – making us afraid to use our boats.”

“Quality of lake ownership lifestyle includes activities off the lake in surrounding woodlands. ATV activity including noise, pollution, and degradation of woods roads make them an activity that should not be promoted by local government or the Association. I have no beef with snowmobiling.”

“Please mine your own business.”

“Little did we realize when we purchased lakeshore property on the Eau Claire chain of lakes what a responsibility we were assuming. We are very blessed to live in an environment of clean, clear water and fresh air. How fortunate we are to be in the center of such a beautiful natural resource – one of the few left in our state. We feel compelled to protect and preserve our water, forests and wildlife for future generations – after all, we are borrowing it from them. Whatever can be done to educate the masses should be done. Our local government leaders should be researching the facts involved in preserving quality water and wildlife.”

“We have never seen this lake turn green and are very concerned. We don’t want it to become like Lake Menomin. The value of our property would decrease and we wouldn’t want to lose our swimming lake. The fishing is also bad. Too many resorts went to campgrounds and loaded with campers. Are the sewers able to handle the extra sewage? Many come to the east end of lake and trespass and leave garbage. Also found water balloons washed up.”

“Due to poor health, I cannot physically do much to help, but would be willing to help in other ways, i.e. phone, promotion, etc.”

“We like our place on the lake just like it is. We do not need a Cedar Corporation or any Association knowing what we do with our lakes, lake homes, or cabins. Take care of your own. Do not worry about the neighbors. A little common sense goes a long way. Thank you. A taxpayer of almost 30 years.”

“We have been at this location for over 60 years and have always been very responsible about preserving the natural beauty and quality of Bony Lake. We love our lake and anything that can be done to preserve it, we will support.”

“The one topic this survey does not address is the huge increase in property taxes. This is a major complaint.”

“Fish spearing plus pressure from licensed fisherman and fish stocking mortality rates (high) are a great detriment to fishing. Reducing limited catch rates won’t help overall. But eliminating spearing between 200 – 300 walleye per year will.”

“We own our home in Barnes by Middle Eau Claire Lake and hope to retire there within the next ten years. We have owned for four years.”

“Just would like to see changes of rules approved by lake property owners and not just a certain group of people. I didn’t even know we were letting high density development until it was already approved.”

“The good weed beds on the south end of Middle Eau Claire have disappeared. Fish habitat is gone.”

“The ATV’s, jet skis and big boats along with people building one house and several garages that house people need to go. One lot, one family home. No trailers not for one or even two years – they end up looking trashy.”

“We would favor some additional harvesting of the deer population. We have about 40 acres of woods in forest management for the purpose of protecting the land.”

“I would like to join the Association. Tell me how. In retrospect, it would have been nice to include this information in this mailing. Thank you for asking our opinion.”

“I feel strongly that the next step should be to apply for Lake Protection Grants. Middle Eau Claire experienced the usual filaments algae bloom this spring, but it has gotten worse the past four years. Was not present at all 8 years ago. In mid-August an algae bloom was present, bottom of lake was not visible in 3 feet of water. First suspended algae bloom even witnessed on M.E. Lake. Lakes upstream from Middle, i.e. Bony and Upper remained clear with little or no algae bloom. Suggest DNR do their intensive nutrient load study such as being done on Whitefish Lake in Douglas County. Require all septic systems to be inspected and dye tested within one year.”

“I feel that the rule regarding grandfathering of failing and out of compliance septic systems and mound systems is definitely adding to the pollution of our lake quality. Also, the crowding of campers in campgrounds as well as adding number of sites without increasing and improving septic and other disposal problems is a major detriment.”

“Why do we have zoning if it is not enforced? How can the county give away a road without clearly indicating its intention to those involved? How can a public access be sold? Who profited from that?”

“If costs of belonging to association – would join again. We are over two hours away and don’t get up there real often. Minnesota takes \$2.00 from license fees to stock walleyes – we could use something like this to get walleye population back – along with no spearing.”

“That property owners main property after building permits checked out that it stays the way it was meant to be used.”

“The main reason for Banres area housing boom is that we’ve been careful to control development. Ironically, prosperity and development can be the cause for future degradation of property values and quality of life. Caution now during our present time of transition in development can pay off later by preserving the very thing that made today’s prosperity possible, minimal development.”

“Thanks for sending me a questionnaire. Come visit us.”

“We choose to drive 6.5 hours to our lake home because of the feeling of wilderness, tranquility and roots. Our children come from across the U.S. to enjoy the quality of this area. We do not advocate a lot more regulation, but do feel the need for more control. Foreign species invasions are of high concern as well as over development and over use. We don’t want our lake to have the same problems as the local lakes around Milwaukee and Minneapolis, where over development, over population and over use are an ongoing problem. It’s always better to be proactive rather than reactive.”

“Should be only one family dwellings and 1.5 acres parcels only. Should be no condos.”

“Thank you for this survey. I think other residents, property owners will treat it seriously and thoughtfully – as have I.”

“Eurasian milfoil is the single biggest threat to the lake. Therefore, the public landing use should be restricted and all boats and other watercraft should be inspected at a gate. Consideration should be given to inspection of septic systems.”

“We feel Bony Lake is one of the headwaters to the Eau Claire Lakes with natural spring. The flow eventually ends up in the Mississippi River system. If something isn’t done soon to stop development and overuse from watercraft – this fragile Little Lake will be ruined forever.”

“I hope that the township/county government go by the property owners answers on this questionnaire regarding planned unit development and density of dwellings on the lakeshore. Otherwise, why do the survey.”

“I appreciate all the work the Eau Claire Lakes Property Owners Association has done in the past. I will rejoin when next newsletter comes. Thank you.”

“What good will this do.”

“A great survey and we want MEC Lake quiet and peaceful.”

“Keep up the good work.”

“We feel very strongly about the situation on the river between Middle/Lower Eau Claire. The Enchanted Inn has built very large docks that restricted the flow of the river and have caused severe difficulty due to sand build-up in getting our kayaks and fishing boat onto the lake. When approached, they are very negative to making changes. Using the Association to assist in vegetation and mediation between the Enchanted Inn and DNR would be fantastic. Also, their bridge that goes over the river is a danger to people in boats and as we understand, it is against code, yet no one enforces the code. We are very interested in helping resolve this issue as a collective effort.”

“Property owners do a really good job and also with information that concerns those of us who live out of town.”

“Lower Eau Claire has one public campground and two private campgrounds (mobile home) parks where trailers have skirting and decks, septic tanks and stay permanently parked year around this addition to the density on the lake or weekends whereby hundreds of people from each area are on the lake contributing to the lower condition of the lake while not paying any taxes or fees to help with any and all things in this area (lake, schools, roads, public access).”

“Our extended family has owned and visited the Barnes/Eau Claire Lakes area since the 1950s. Today, as non-resident, tax paying outdoors people, avid catch and release fishermen, and preservationists, conservation of the Eau Claire Lake is vital to us. Do we really want another overused, overbuilt, and overpopulated area like Eagle River, Minocqua or Lake Geneva? We need to remember: “man belongs to nature. Nature does not belong to man.”

“While this survey tends to only cover the lake where one resides, it overlooks the fact that this is a chain of lakes. We feel what affects Birch also affects the other small lakes (see A, E, H, J, and the overlooked Devil’s Lake). Engine and craft size isn’t what’s needed to protect these lakes – a speed limit is more effective – consider slow wake as used in the channels to protect weed beds and prevent stirring up the muck from the bottom. In over 50 years of ownership on Birch Lake, we didn’t notice the muck being disturbed until jet craft and high speed heavy bots appeared. The last five years has seen a lot of damage done to the shallow lakes, that we hadn’t noticed before.”

“I believe in pursuing the look and the environment. My family has been coming up here for more than 70 years.”

“They are people that have one sided views – will not sway one way or the other. They are old people that are nosy, controlling. They have had a bad reputation and every year that they are around, the reputation gets worse. People up there want to enjoy a beautiful recreational area. That is what Wisconsin is all about - being friendly and neighborly. This group has no idea how to do that. The time for water skiing and jet skiing was changed legally by the government of Barnes to 6:00. But no, Mr. Lee Weisner has to have it at 5:00. So he is the one behind all this bullshit to get it changed back. Voting was fixed because people that have multiple properties only got one vote instead of one vote for each lot owned. Unfair.”

“Like to see more fish cribs or to help install.”

“Largest contributor to shoreline erosion is tubing behind power boats. The boats operate at lower than planning speeds causing large wakes that erode shoreline. Jet skis and water skiers operate at speeds of planning and above and throw much less wake.”

“Anyone on the lake is reasonably responsible for it. The lake could use some fish put in it.”

“Bravo. Good job for doing positive things instead of just complaining and seeing the situation get worse. Lakes can be cleaned up. Lake Erie is one superb example.”

“My time at the lake is decreasing while my children, who live in Minneapolis-St. Paul, is increasing. Time at the lake is sporadic. I will talk with my children.”

“Our property is a jointly owned family property. It is used by all members, but I am the closest. My siblings live in a much greater distances, so their help isn’t possible. But I would be willing to help on a limited basis although my ability to visit is also somewhat limited due to the distance also.”

“Jet skis disturb the peace and should have more restrictions on their use. Limit condos to larger lakes only and restrict the number per lake. No condo’s on small lakes like Sweet Lake. Inspect all washers/dryer systems on cabins. Two recent cabins on our lake sold in the last year and wash machine water was being pumped out to the ground near cabins and not in septic systems. New owners discovered this. Hundreds of gallons of soapy water was leaching into the lake.”

“Why new owners in the last three years allowed to build on 100 feet of lake frontage?”

“Our Association has good people that keep themselves informed. The annual meetings have people from many lakes and they present various subjects well. Thank you for your concern.”

“Limit jet ski use to Birch Lake and Robinson Lake to none at all, jet stream destroys the vegetation much worse than outboard motors.”

“I’m glad you’re doing this survey.”

“Control the deer population – destroy the young forest trees. Control size of boats and use of jet skis. Upper Eau Claire Lake is a beautiful setting we need to protect, maintain and preserve. Can we improve the fishing.”

“The Eau Claire Lake Chain has excellent water quality and the three big lakes are exceptional. They merit a high level of proper stewardship to offset the impacts of high summer usage. These lakes are also sensitive to human use impacts so measures to restore shorelines to native species, to let trees and bushes remain in the water for habitat and to curb urban-like landscaping should be implemented ASAP.”

“I think dense grass retains moisture runoff as good or better than typical undeveloped lake front.”

“I do not own property on the lake and do not have an opportunity to use it very often.”

“Two concerns. 1. Each year the lake bottom is being covered with dead vegetation – with a massive build-up over the years. The east end of the lake is being taken over by pickerel and lilies. 2. The boats being used for fishing are not coming from the lake property owners. At least 70% are coming in from the landing. The lake is not large enough to service all the area north of Barnes.”

“A season visitor now until I retire.”

“The town and county made a big mistake allowing a gravel quarry and hot mix plant to be put in operation at corner of SR27 and Peace Road. The noise from 5 a.m. to 9 p.m. is loud including dynamite blasting. Property Owners Association should lead an effort to reverse this decision by the county and town.”

“We think it’s not fair for boaters to have free garbage and the property owners (tax payers) have to pay for theirs.”

“The Town of Barnes has already taken surveys. Survey filled out by all property owners.”

“After enjoying 30+ years on Middle Eau Claire, it is very apparent the water clarity and quality has significantly suffered.”

“I strongly feel in education not regulation.”

“If you ask the real old timers that paid attention, you will find that there were not dense pines all crammed into the first 50 feet from shore like today. Their droppings of needles and pollen have affected the lake. We should encourage removal and replace with birch, oak popple, etc. Even though I have two 2-cycle outboard motors, I would encourage to ban them 15 or 20 years from now. All that oil mixed in with gas gets vented through the prop and much is not burned. Stop the lice lawns to the lake edge grandfathered or not. Clean up Eleanor’s lawn/woods for her – use tax dollars. She spreads plenty of cash around for us. Give tax cuts to resorts that serve the residents needs. Most are gone. Bring them back – it’s what made this area fun in the old days. Get cell phone tower. Safety first.”

“This survey was a great idea.”

“Stop further restrictions to property owners. Most want to do proper maintenance of the lake they care for the lake. Restrict those that come for the day and don’t care to preserve quality. The town has gone overboard on restricting usage. I see you have a special question on jet ski use. We don’t own one, but the town should realize there only about 4-5 ski owned by property owners. One should worry about pontoon use and possibility of chopping up swimmer when they drive up 5 feet from docks to look up into owners property. The lake saw minimal boating activity this summer. Gas prices and local ordinances have restricted usage.”

“Appreciate the opportunity to have input. Trust this and other surveys, meetings, etc. are not part of a rubber stamp. Jump through the hoops. Types of exercises on your/our part that leads to an already predetermined litany of unneeded or extremely restrictive laws and regs some governmental agencies think we need and will ram down our throats. Please be careful of the belief by some feds, state gov. or even county and local that they know what is best for all of us.”

“#31 – would support a requirement for 4-stroke motors.”

“I have been enjoying the Lake Claire Lakes for 40 years. This lake was always known for being clear and sandy. But I have noticed in the last 3 years that there is more floating weeds in shoreline and Eau Claire murky bottom and I believe the decrease in cray fish is playing a big part in the negative water change.”

“Homeowners are disappointed in the lack of support from our local officials toward matters important to the homeowners. So many residents objected to the high density development on Bony Lake and were ignored by town officials and county officials. These were homeowners who elected the officials in the first place so they deserve more support. When a resident on the Bony/Middle channel had benzene in their well water no one from the town board or property owner’s association showed any concern or support. This is a very serious matter that could even affect future generations in their family.”

“As I have indicated above, the water quality is degrading. At the boat ramp, a more safe docking facility could be added.”

“Douglas County needs to become more proactive towards its lake and water sources. They need to look at enforcing moe of its ordinances or looking to decrease density of shoreland development. Our condo association permits a campground and its users to use our beach and shoreline and many ways there are many people using a small amount of shoreline (more than 20). Our condo does allow this. The county should look at campground usage and decrease the number of campers allowed. Enchanted Inn also has many campers and boats docked.”

“I have vacationed in the Eau Claire Lakes for 60 years. My father owned a house on Robinson for over 27 years. The channels between the lakes had sand bottoms with very little weeds. Now the weeds almost choke the channels. I do not know what has caused this, but it is a problem.”

“We love this little clean lake and its natural beauty – hopefully it will remain so.”

“An issue not addressed in your survey was exotic species such as rusty cray fish which are adversely affecting our lakes and fish habitat – it’s not just Eurasian milfoil that we need to worry about.”

“This survey is a good idea, please sent out the results. We need better enforcement of ordinances – seems like some people just do what they want. No asphalt factory or gravel truck company. Keep the north the north – if they want city type or crowded lakes – go down south. Get all ATV’s off the roads and out of the woods. They destroy areas.”

“I appreciate what the Lake Property Owners Association does to monitor the lakes and water for problems (and any others who do also).”

“How, on earth, could the Barnes Association effectively study Eurasian water milfoil? What a waste of taxpayer money. I understand wanting to do something about water quality, but the opinions of people who are really interested in slowing boats and stopping jet skis for personal reasons is not the answer – it is much more complex. This survey seems geared to getting support for more control of lake property under the guise of improving lake water quality. I am in favor of clear lake water, but have specific scientific plans, not just opinions of people who probably do not know of what they speak.”

“We see problems on the lake and contact the county and township. We’ve seen grey water systems (two on our lake) dumping washing machine water on the lakeshore. One sweet lake resident maintains a heavily fertilized lawn right to the waters edge and complains about the geese on it, but will not accept that her lawn is the problem. All these people need education as well as increased enforcement.”

“The Lake Association are seasonal bigots who do very little to help the economic status of our community.”

“Heavy spear fishing every year is ruining fishing quality. Why can’t they spear every other year or every two years.”

“I just discovered this association at the Wisconsin Lakes Conference at Telemark this year. I would suggest a better campaign to make lakeshore owners aware of your group. Up to now, I only knew of the Conservation Club. We need all property owners to get involved, I think. I wish I had known of your association a long time ago. So glad you are here, you are doing what you have been doing. Thank you and involve me please. Don’t know what I can do, but I sure am willing to help – to try anyway.”

“Recreational activities should be allowed after 6:00 p.m. The water usually looks like glass at that time and skiers and tubers would have a great time. The boat landing needs some serious improvements done. More fish in the lake would be great for the fishermen. Can you raise the bridge and fix the logs along either side of the channel to allow for easier access to the Upper Eau Claire Lake?”

“Too many fishermen. Recreational fun short – the house should be extended. I would like to see more fish stocking. Robinson Lake needs a new boat landing (fixed). More places to park and maintained. I would like more ATV trails around the lake. The bridge needs to be replaced and widened between Birch Lake and the Upper Eau Claire.”

“Control of crawfish – small mouth bass. Lower nutrient (septic) flowing into the lake.”

“I know we can’t go back 50+ years, but overdevelopment must be guarded against. What do you mean by responsible in question 22? Channels should be kept free flowing.”

“First, we strongly object to the decision that was made to allow a gravel pit industry and paving and gravel processing operation to wreck havoc on our peace and tranquility from 5:00 a.m. to 7:00 p.m. six days a week. How could the town have done this without input from all the property owners who are affected. Furthermore, the operation is draining our lake of its water, which is already low due to the severe summer. Where is this water going after it used for road surfacing. Does it end up in our watersheds, contaminated? Does it runoff into our lakes and streams? Secondly, a vegetative buffer does not work to control shoreline erosion in areas in which waves cause water to constantly beat along the shore. A rock barrier or a solid retaining wall are more efficient in controlling shoreline erosion. We have lost about 3 feet of shoreline over the last 5-7 years with a vegetative buffer. We have two answers to number 32 because I am a seasonal resident and my husband is a year-round resident.”

“This town is nothing like it used to be. They want laws, laws, laws, and more laws. I do believe they’d like it like the Stepford Comm. in that movie. The new people who have moved in are mostly from MN. There are 10,000 lakes in MN. Why don’t they park their behinds on one of those lakes? I’d love to be involved, but the new people who have moved in have taken over and you cannot tell them one thing. I was born and raised here and they seem to think they know more about the history of the town than we do. I’m not being mean, I’m just telling it like it is. All you hear is ‘well, we did it this way in Minneapolis, Baldwin, Eau Claire, St. Paul, Duluth, wherever.’ Then why did they leave those places? If they want to make it into something they left, why leave? They want police, police, police, and all the cops do is give you a ticket for 3 miles over the speed limit. If there was real trouble, they couldn’t handle it anyway. Now we have cops parked behind the town hall, the bank, etc., etc., just waiting for a speeding violation to occur. They demand blacktop roads all over the town. The town to me hasn’t become nicer, it’s just full of busy bodies. Also, they don’t drop much money in town. They want those paved roads so they can go to Hayward, Ashland, Rice Lake, Duluth, etc. That’s where they spend their money.”

“The Town Board, based on the northern paving fiasco, is obviously clueless about protecting the only real resources of the Barnes/Eau Claire Lake area – the lakes and quiet clean air. There already should be a fertilizer ban and ordinance to prohibit lakeshore property owners from installing asphalt driveways downhill to lake. We’ve owned the land for 10 years and have kept all 450 feet of shoreline natural and cut down no trees, while other owners have been allowed to do grass lawns right down to the shore.”

“I have owned my property on upper Eau Claire since 1968. It has remained and maintained a beautiful natural environment. It pleases me that your efforts to keep it that way are appropriately aggressive. Thank you.”

“This survey should have been done years ago.”

“I live on Birch, but fish on Robinson. Birch was dredged on a regular basis many years ago. It is in need of some dredging to increase fish populations (not just a hatchery).”

“I am very against the northland gravel development off of Highway 27 – horrible for eco and environment. Of course, it was money/politics at work, but they should not be there.”

“We have owned our property for 25 years. It has been in our family for over 60 years, bought by my great-grandparent in the 1930’s. It has a special meaning to us and I do not like all the dense building going on in the chain of lake area. The more people you allow on a piece of land, the more pollution and erosion you will have. The lakes are clear now, but in time overuse will destroy them.”

Question 38

38. Additional Comments:

- “Better quality stocking of fingerling – not fry walleye. Stock of S.M. Bass to control red Cray fish population.”
- “Birch Lake should be a no wake lake. It only takes minutes to cross it. There is a lot of silt on bottom and it should not be disturbed. The lakes are really a nice body of water, but they are going to have to be taken care of. It is people living with property on the lakes that are tearing them up. Thanks for the survey.”
- “No high density development. Thank you.”
- “Keep Pickerel Lake on your surveys. Get that 10-6:00 p.m. water sport time of operation back to its original 10:00 a.m. – 5:00 p.m. The majority of people have been in favor of 10:00 a.m. – 5:00 p.m., but the Town of Barnes (Board) has stuck this in, and then has refused to change it back to 10:00 a.m. – 5:00 p.m.!! Do more to inform people of just how important it is to keep our lakes and lands unpolluted to pass the stewardship to our young and next generation. Encourage catch and release. Go out and meet with people in person – where is your welcoming committee.”
- “I do believe we have the best lake in the area. It is very closely monitored – shore lines are very good.”
- “I do not fish. My husband was an avid fisherman and we had a resort where we always informed our guests of rules and regulations of the lake and we also included some of our own. I am too old to be of any use in activities with the lake, but I do want to do whatever is needed to keep our lake clear and clean – fishing good – wanting everyone who owns on the lake to take excellent care of what we have and to keep it like we found it. It is a wonderful area. We have an awfully lot of 4-wheelers young and too young and older who use the roads as a race track. We need our rules for safety of all. My sons do not live here. I joined because I thought they lived here as youngsters and they loved it. So they will help to keep it clear and clean for everyone too. We also need spearing limited to this time of year – fall – when the walleyes go up the river to spawn.”
- “I hope the septic systems on the lake watershed area can be inspected and made to be in compliance with current regulations with no grandfathering of existing systems. I believe this is the biggest issue with keeping or improving the water quality.”
- “Regarding the question regarding a maximum mp and type of motor used, it is not the size of the engine – it’s the safe driving of the boater, even a fishing boat with a 5 mp outboard.”
- “Ban water skiing – jet skis. Remove ¾’s of houses/cottages on lake. Enforce a no lawn within 50 feet of lake shore rule. Stop further building within 200 feet of shore lines. Have everyone take care of their own property. Don’t bother me.”
- “Thank you.”
- “We greatly enjoyed Cedar Corporation’s presentation at the property owner’s association. I wish we could have had a personal detailed report. It’s too much to remember in such a short time. The presenter did a great job. I was highly impressed, especially when he talked about water temps and dissolved oxygen levels which is what I collect along with phosphorous and chlorophyll samples for the State Lab in Madison. One last thing I wish to emphasize. Rules and regulations are worthless unless they are enforced.”
- “Have had the property since 1970. Have witnessed a decline in fishery. In 1970’s to early 80’s, Middle and Bony had a wide variety and plentiful amounts of aquatic weed such as coontail, American milfoil, cabbage/lily pads, etc. Weeds provide habitat and food for young fish remove habitat no fish. Noticed Cray fish in 80’s plus floating weeds everywhere. Within 5 years, weed beds are gone. No longer catch or see pan fish. No spawning beds either. Northern Pike, musky decline. Young ore need weedy habitat, walleye decline. Large mouth bass decline. Only small mouth bass increase. They are main predator of rusty Cray fish. The only weeds left are isolated patches of brown cabbage in extreme shallow water. Fish do not seem to like them. Bony and Middle used to have weed lines as deep as 16 feet. DNR fish trap studies back this up. So far, this green off of our dock we have trapped and killed or ate over 300 rusty Cray fish. The Cray fish have also killed off the lily pads in Bony.”
- “Again, if there’s going to be an ordinance to restrict use by certain people from 1-5, why isn’t it enforced? If it’s not – get rid of it. I worry about the growing problems about weeds washing up on our beach, especially in the fall. We hauled tons of it out of the water last year.”
- “The greatest risk to the beauty, appeal and environmental quality is our development.”
- “Eau Claire River watershed is extremely unique, and should be conserved and protected for its naturally beauty and value to the environment of northwest Wisconsin.”
- “Education of lakeshore owners is very important. They need to know why mowing to the water line is not good for water quality. They need to know that woody vegetation/windfalls in the lake are good habitat. Demonstration of BMPs at selected sites would help lakeshore owners know what to do.”
- “Question #32 appears to forget that some of the lakes in the Eau Claire chain and in Town of Gordon.”
- “Lake quality needs to be maintained as this is what can help keep property values strong. The water quality attracts higher income buyers.”

“Re: q. #17, education is more effective than the threat of enforcement which is unlikely anyway. Bayfield County and local government should work with property owners to preserve and improve lakeshore restoration. Vilas County is a current excellent example of cooperation between City, DNR, and property owners. Re: q. #22, the Property Association could send a mailing or include in tax statements a list of strong suggestions as to lakeshore care and restoration. Re: q. #19, I think every residence should be required to have a current septic system or a deadline to have one installed with possible financial assistance from the State. Applies to lakeshore residents. Let common sense dictate however and not a state law originating in Madison.”

“Yes, the lake needs to be monitored and cared for however this must not be intrusive into people’s lives or make it difficult for them to maintain their property. Also, the protection should not exclude others from enjoying the lakes. We should strike a harmony of carefree and sharing what God has blessed us with. Every lake should be able to have one or two lodges of multi-living establishments – moderate to the size of the lake – because the area does need tourism for the local economy. Septic tanks can be aeration – this would help with that problem – or concern. Any such establishments should post requirements for using the lake and provide their own security person or bouncer to oversee that folks abide by the lake requirements.”

“This year for the first time we have experienced dead fish washing up on our shore. Also, the motors catch the natural vegetation growing at the bottom of the lakes necessary for fish habitat and pull them up. This year we have a 6 foot area along our entire shoreline of washed up vegetation – the most we have experienced.”

“Do you realize we are the only town in WI that restricts water skiing, tubing and personal watercraft use?”

“Growth will be the greatest potential threat to water quality. Four units per 150’ of frontage is a very large threat. Water quality degradation can be slowed, but it is very difficult to return. Too many nutrients, esp. phos., will result in rather rapid reduction of water quality. Development needs to be balanced with protection or the very characteristics which users find desirable will quickly go south.”

“We only have a cabin in the eastern edge of Barnes Township. We use more lakes in the Drummond area. Therefore, we cannot answer the questions truthfully.”

“The lake is a great resource. The limited water skiing hours hurts this resource.”

“Exotics is the one thing that really worries me – more might be done to harm boat owners or transport. I see more signs in MN. A fair amount of bottom growth in our area – not algae I guess – doesn’t seem worse, but not sure how natural it is either.”

“My property is located on the southeast end where there has been an increase of various vegetation – lily pads, pickerel weed, muck. It becomes more difficult each year to access lake by boat or person.”

“RE: old septic systems: This survey has called attention too many factor affecting the quality of Eau Claire Lakes. However, a major factor that needs to be addressed are old septic systems that may be leaking contaminants into ground and lake water. New septic systems must be pumped every three years by law; there appears to be no law that governs old systems. Please work toward legislation (town, county and state) that mandates periodic testing of all systems, especially those around and near lakes. That is a bigger, more important factor than the efforts preventing “high density development.”

“the ordinance that requires individuals that get a variance to make property improvements to adhere to a shoreline buffer zone is not fair when others that get a permit without going through a variance are not required to do the same. The shorelines can best be protected with appropriate rip rapping rather than alders, brush, reeds, weeds, etc.”

“PWC are out of control – DNR regulations are constantly ignored (ban them). Limit max. horsepower type of boat on our lakes. Lower Eau Claire. I believe the Forestry Dept. controls the dam at the south end of lake. They should lower the water level during the winter and raise it during the summer. Current practice of doing nothing causes soil and vegetation erosion on lakeshore following winter break-up.”

“Tax write-off for planting trees. Lower property tax for empty frontage. More education for resort owners on boat wakes and water (boating) courtesy. Riprap frontage and lawns to water edge. Fewer deep weedless spots in the bays – more weeds in all the bays (now than 20 – 3- years ago).”

“A lot of people today are building apartments on top of garage. Thence forth two developer per 150 feet. I would like to see less density on small lots. Some are ten feet from our property lines.”

“There must be a consulting firm closer to the region in question than the almighty Cedar Corporation. They are a consulting firm that only deals with matters in their best interest.”

“The walleye fishing is getting worse every year.”

“Thanks.”

“The bridge where the lock is on South Shore Road. The Town should be involved to correct the runoff to the river leading into the lake. I also feel that lower receives pollutants from Upper Middle Lake and the surrounding smaller lakes.”

“Current lake restrictions are killing property values. Fishermen need to be told they don’t own the lake – many are drunken slobs.”

“We are in the Town of Gordon – the Association seems to be most concerned with Barnes – the questionnaire is a good example – Gordon doesn’t seem to exist.”

“My perception is that the large property owners and those who own large tracts tend to be the entities who receive preferential treatment from local authorities. An example is allowing the new boathouses on Upper Eau Claire that are right at the water’s edge on the properties that used to be the campground even though there is supposedly an ordinance prohibiting this.”

“We appreciate everything the POA is doing for the environment and our lakes. We must be vigilant or we will lose our children and grandchildren’s inheritance. Keep up the good work on behalf of them (and us).”

“As a property owner, I don’t like being told how to use my property especially by someone who is not a property owner in the area.”

“Why are there two associations – you and Eau Claire Lakes Conservation? Can’t you combine your efforts with one fee?”

“Thank you for conducting this survey.”

“We both appreciate and value the time we get to spend in Barnes. In approximately 7-8 years, my husband and I will retire and plan to be more active in preserving the uniqueness of the area.”

“I enjoy the beautiful lake.”

“The small town and quiet lakes are what we come to Barnes for. We don’t want it to grow. I suppose this is impossible, but if it gets much bigger and more populated, it will lose the charm to us. The ATV and snowmobiling also keep us in this town.”

“The closing down of resorts has made an increase in camping trailers in several areas. These trailers are parked all year long and increase the fishing pressure, etc. on the lake which we don’t believe is good. Most of these trailers are eye sores to the community and we would assume don’t contribute much to the tax base, thus less money for important projects to improve the lake.”

“Haven’t been able to use the lake since 97 or 98 when Moony dam was rebuilt. That was when the sand bar began expanding.”

“I truly loved the upper and surrounding lakes. Overall, I think it is one of the most beautiful and serene places in the whole Midwest Region. I think it’s crucial we all work hard to keep it that way.”

“Past few years, water lilies are growing at our end of lake. Never had any before. Is the lake changing. Real mucky bottom, can’t swim, so don’t think taxes should be so high.”

“We have not lived here long enough to answer some of these questions. I would say preventing Milfoil would be the biggest concern.”

“Generally you are doing a good job. I have liked the past talks/lectures at the breakfasts. They work well for me. They have changed my view of things. Thanks.”

“Your survey questions are aligned and composed to create problems that do not exist. Also, we should live with the hours and restrictions now provided for boating, water skiing, jet skiing, etc. by the State Statutes and not town or lake association ordinances. Thank you for allowing me.”

“I think the zoning restrictions are ridiculous to a point. We have 265 feet of shoreline that is undeveloped which we intend to leave that way, plus we have nearly 2 acres worth of wilderness between our cabin and the lakeshore and we can’t even put a small gazebo up down by the lake. Well, 35 feet in from the shoreline. I fully understand why they are there, but when you have someone who is conscientious of the needs of the lake and natural surroundings, there are extremes.”

“Question #20 shocked me. The present rules allow four dwelling units per 150 feet? I think that needs to be changed quickly to preserve the present character of the Barnes area to reduce the rule to one dwelling unit per 150 feet.”

“I love Upper Eau Claire Lake and plan to retire there.”

“The Eau Claire Lakes currently have the most restrictive rules for boating and personal watercraft in northwest Wisconsin. We have a lake that is poor fishing and you can’t water ski on it after 6 p.m. I own a pontoon, but there should be more use allowed than this (pontooning after 6). I have fished my entire life. The Eau Claire Lakes are some of the poorest fishing anywhere. People are all concerned about water skiing and jet skis, but they are all breaking the rules on lawns, shore land development, etc. and nothing is being enforced. People keep over their limit of fish and undersize fish with near zero enforcement. We need to enforce the rules we have before we make more. The 6 p.m. water ski hour is a good thing, much better than 5 p.m. Also, the proposed pan fish and bass limits are a good idea.”

“Non-residents owning property and paying the same taxes should at least be able to defer the non-resident amount of license fees to their local lake association. Improved communication may be able to get increased funds from those concerned about the area.”

“Please control winter recreators from accessing property of others via the frozen lake. It appears that there is a trail across my property.”

“Enforce a no-wake on Robinson Lake and the water quality would improve over time.”

“Too long a survey.”

- “Our family has owned our Bony Lake property since 1923. It is a very special place now being enjoyed by a 4th generation of our family. Improving and monitoring the quality of the environment on Bony Lake and the other Eau Claire Lakes is very important to us.”
- “I have personally put up loon signs and landings and channels “slow” no wake buoys and information packets on every dock on upper Eau Claire, Smith and Shunnenberg Lakes.”
- “I really appreciate your efforts to maintain and improve this special area. The relative lack of development on the lakes is an enormous asset. Some do not fully appreciate as is the water quality. Many areas have lost these qualities. Let’s make sure we do not. We have a good balance of usage of the lakes today.”
- “As stated above, we would like to take steps to restore our shoreline buffer and plant native tree species on our property. The only thing that has prevented us from doing so to date is not knowing who to call. If the Eau Claire Lakes Property Owner’s Association could provide a list of resources or guidelines with respect to proper restoration, that would be very helpful. As lakeshore owners, nothing will affect our property values more than the quality of the lake and its shoreline. We should all be willing to do our part to improve it – including paying for it.”
- “Counties and townships need to work together more closely. More funding for DNR. More public education about protecting and caring for our lakes, rivers, wetlands and watersheds. UW-Extension assistance with writing and obtaining grants for lake associations.”
- “I would love to volunteer for LPO, except I believe they are against motor sports type run which is the reason we are there in the first place.”
- “I think the restrictions on water skiing and personal water craft are unfair. I am originally from west central Minnesota and they have no such restrictions. The fisherman/fisherwomen and recreational water sport users co-exist quite well. Also in the past 5 years or so, personal water drafts have gotten much quiet than they were years ago. To put the shoe on the other foot, how would the fishing crowd like it if there was a restriction on when they could fish. By the way, my family also likes to fish. Please feel free to contact me.”
- “I don’t like the undertone of this survey. I think the environment around here accommodates most people’s interests. I suspect (and I admit to being paranoid) this survey is looking for issues to pursue that maybe don’t need to be chased; looking for problems that aren’t really needing to be fixed. I hope I am being too suspicious. I am also having a problem with what seems to be a melding of the interest of the Town of Barnes with those of the Eau Claire Lakes Property Owners and/or the Conservation Club and their Board of Directors have decided to use the funds for this survey that is one thing. If it comes from the Town of Barnes and is being paid for from tax dollars mandated by law from me that is another.”
- “When I bought property on this lake in 1983, it was a hub of activity. The fishing was great and there were always several boats on the lake. It is dead now in all of the above uses. Even pontoon boats are not having trouble getting into the lake. The fish are mostly gone. Used to see muskies all the time. Have not seen one for three years. No crappies, no walleyes, no blue gills as one resident pulled out all the bull rushes where they used to spawn. Weed cover is down by 75% and even the lily pads are mostly gone. It is all very sad.”
- “Control jet skis and high power boats. Enforce the laws that are on the books now. Be sure out of state people obey these ordinances and laws and if not, arrest them – all they get now is a slap on the wrist and let go to do it over again.”
- “I believe the POA should actively pursue adoption of zoning rules by the Town of Barnes to eliminate PUD high density development plans allowed by Bayfield County.”
- “Most lake property owners have done a great job of maintaining their shorelines. Give them support and continued flexibility to improve as they see fit – after all, they are paying dearly for it with extremely high tax dollars. Force the Town of Barnes to use our high tax dollars to help pay for necessary lake quality improvements. Consider a launch fee for all non-lake property owner lake users and use those funds to support necessary improvements.”
- “We love this lake area. We believe that its biggest strength is its restful nature. This should be preserved by controlling number of residents and presence/use of jet skis.”
- “I would like to know about the highest priority needs are and how donations or fund raising could help.”
- “I no longer live in Barnes, even though I still own 5 acres on Call of the Wild Road.”
- “Rumor has it that the jet ski hours have been expanded in Eau Claire Lakes. Is this true? Was there any public meetings for input?”
- “I value the attention given to the issue of water quality/resource usage and support efforts to maintain and improve the quality.”
- “I thought the DNR was responsible for testing fish levels and water quality.”
- “My impression of the association is its prime purpose is to promote landowners, limit development, restrict use. I formed this opinion when Sundance Campground started in the early 80’s and the association was formed. Sundance gave thousands of kids the opportunity to enjoy this creation of God’s. It did no hard to the lake. The lake water quality is

great and has remained so since I purchased my home here in 1976 and I would oppose any further restrictions on its use other than restricting walleye spearing in April.”

“Too much regulation can foster ill will among property owners and diminish neighborly atmosphere. Restrictions and regulations should only be enacted and enforced when an overwhelming majority of owners welcome such action.”

“Go Packers!”

“Thank you. I’ve been thinking about what I can be effective doing. Helping with a summer project? Sometimes I spend fall time at the cottage on Lower Eau Claire. I would like a summer meeting where knowledgeable people share how to handle runoff.”

“This area has a specific quality. It is not commercialized like Hayward. My father has been coming to this area for over 60 years. It has maintained its beauty. However, the fish population has dwindled. Is it because of over fishing and the DNR not yearly restocking all lakes or is it the water quality not being able to sustain these fish. I was told the logging industry threw sawdust into the lakes by the tons which accounts for the muck. Because of the fact I live on Pickeral Lake and just because it does not connect to the others, it gets no attention whatsoever. That is why each lake should have its own association – so that proper funding and my membership donations go to my lake. By the way, Wisconsin was listed on TV by EDA as one of the worst lake states. Lakes with bad water and Vermont was best. For your information, approximately three weeks ago, Good Morning America had a series on family vacation. This particular series was on best and worst lakes in the USA. What aired really made me sick. Wisconsin was listed as having some of the worst water quality lakes in the Country. Vermont and Maine the best. Do you realize that that does to the tourist trade as well as homeowners that put a priority on water quality. I recently built a \$200,000 log home and am now debating on building in a different state such as Vermont. I would suggest the association log on to see what the best lake states are doing right. This should help you. #18 will give you an idea on how little the Dept. of Natural Resources helps the lakeshore owners. They allowed Dahlberg Electric to cut a 30 foot wide piece of natural vegetation from my steep slope to the water because of a service wire that runs across the lake. Instead of having the service wire relocated or stopping this procedure on lakeshore land, these buffoons butchered my land and DNR did nothing. Frankly, I don’t care about the safety of their staff. If some asshole is dumb enough to pick up a live wire, so be it. That is not justification to run rampant on private property and damage this land.”

“I have been coming to this area for over 20 years now, enjoying the peace and quiet and the wonderfully clean waters. This watershed is unique and fragile. Half a foot of topsoil over a thin layer of gravel and then sugar sand. Ideal land for filtering water and growing trees. Not ideal for heavy use. Trampled, torn up vegetation takes a long time to recover. I have observed increasing erosion problems in the last 10 years due to non-stop year round use of the land. Snowmobile in winter. ATV’s the rest of the year. There is no chance for the land to heal under these conditions, and every year it gets worse. Everyone knows that overuse leads to decline. Over development around many of the lakes is leading to the subsequent decline in the water quality of those lakes. The very qualities that give Eau Claire lakes their appeal will be gone 20-30-50 years from now if we don’t plan ahead. The trouble is – most land use plans are cursed with shortsightedness. In my view, a 3 point plan – limit – educate – compensate – is called for. Limit development to sustainable levels. Increase awareness of the problems by educating the people (and I mean all the people who use the lakes and land). Give landowners options/incentives (compensation) to preserve their land instead of developing it. The Eau Claire Chain of Lakes community could set a fine example of how to protect and enjoy our precious natural resources. Carpe Diem.”

“Thank you.”

“I have seen many instances of checking for fishing licenses and fish kept but little or no times that limitation on boating and jet ski are being enforced.”

“During summer, skiing hours need to be extended to 7 p.m. to allow skiing without interference from pwc’s. ATV activity needs to be curtailed in town areas.”

“Am too old to do much physical work, but would be willing to donate cash.”

“No big development like condo’s and such.”

“Would like to see water skiing and jet skis off of shallower lakes like Birch that have access to deeper lakes. Signs would need to be posted at the channels since no one looks at the landing. The sediment build-up is increasing. It used to be when we went swimming the sediment on sand would wash away, now after one week it is one inch deep.”

“The Barnes/Eau Claire Lake Property Owners Association are doing a fantastic job. The officers are very dedicated to do an excellent job to improve the quality of the surrounding lakes. They work very hard.”

“We would be willing to help with Hwy. 27 roadside clean-up a couple of times each year.”

“Got this after we sold our cabin, but thought you’d want the input.”

“Sons Perry, Wayne and Bruce will be spending summers at the lake. Wayne has worked for Round Lake Maine for some years. Perry and Bruce expressed interest in volunteering for landing control.”

“When the Barnes/Eau Claire Lake Property Owners Association lets everyone that owns land, then they might be a joinable club. They are or are perceived to be better than everyone.”

“In the decades we have been coming to the Eau Claire Lakes, we have seen a marked reduction in the use of our greatest resource – the lakes. Activity on the water is down markedly on Bay/Middle and Pickeral which are three lakes we are associated with. The lakes are not being restocked and because of the fishing burden, the days of a large catch are gone.”

“I believe the water skiing hours are very unfair. These people should be able to use the lake just like all others at daylight hours any time. What stops someone from driving a large boat at any time? What difference does it make if there is a skier on the back? It seems like the fishermen are being given priority – they can fish year round while water skiing is a short season. A very outdated and stupid rule.”

“Keep each area on lakeshore drive (upper Eau Claire) clean.”

“I’m 62 years old, have had three heart attacks, so I can’t do much to help, but it’s a shame about all the silt – making us afraid to use our boats.”

“Quality of lake ownership lifestyle includes activities off the lake in surrounding woodlands. ATV activity including noise, pollution, and degradation of woods roads make them an activity that should not be promoted by local government or the Association. I have no beef with snowmobiling.”

“Please mine your own business.”

“Little did we realize when we purchased lakeshore property on the Eau Claire chain of lakes what a responsibility we were assuming. We are very blessed to live in an environment of clean, clear water and fresh air. How fortunate we are to be in the center of such a beautiful natural resource – one of the few left in our state. We feel compelled to protect and preserve our water, forests and wildlife for future generations – after all, we are borrowing it from them. Whatever can be done to educate the masses should be done. Our local government leaders should be researching the facts involved in preserving quality water and wildlife.”

“We have never seen this lake turn green and are very concerned. We don’t want it to become like Lake Menomin. The value of our property would decrease and we wouldn’t want to lose our swimming lake. The fishing is also bad. Too many resorts went to campgrounds and loaded with campers. Are the sewers able to handle the extra sewage? Many come to the east end of lake and trespass and leave garbage. Also found water balloons washed up.”

“Due to poor health, I cannot physically do much to help, but would be willing to help in other ways, i.e. phone, promotion, etc.”

“We like our place on the lake just like it is. We do not need a Cedar Corporation or any Association knowing what we do with our lakes, lake homes, or cabins. Take care of your own. Do not worry about the neighbors. A little common sense goes a long way. Thank you. A taxpayer of almost 30 years.”

“We have been at this location for over 60 years and have always been very responsible about preserving the natural beauty and quality of Bony Lake. We love our lake and anything that can be done to preserve it, we will support.”

“The one topic this survey does not address is the huge increase in property taxes. This is a major complaint.”

“Fish spearing plus pressure from licensed fisherman and fish stocking mortality rates (high) are a great detriment to fishing. Reducing limited catch rates won’t help overall. But eliminating spearing between 200 – 300 walleye per year will.”

“We own our home in Barnes by Middle Eau Claire Lake and hope to retire there within the next ten years. We have owned for four years.”

“Just would like to see changes of rules approved by lake property owners and not just a certain group of people. I didn’t even know we were letting high density development until it was already approved.”

“The good weed beds on the south end of Middle Eau Claire have disappeared. Fish habitat is gone.”

“The ATV’s, jet skis and big boats along with people building one house and several garages that house people need to go. One lot, one family home. No trailers not for one or even two years – they end up looking trashy.”

“We would favor some additional harvesting of the deer population. We have about 40 acres of woods in forest management for the purpose of protecting the land.”

“I would like to join the Association. Tell me how. In retrospect, it would have been nice to include this information in this mailing. Thank you for asking our opinion.”

“I feel strongly that the next step should be to apply for Lake Protection Grants. Middle Eau Claire experienced the usual filaments algae bloom this spring, but it has gotten worse the past four years. Was not present at all 8 years ago. In mid-August an algae bloom was present, bottom of lake was not visible in 3 feet of water. First suspended algae bloom even witnessed on M.E. Lake. Lakes upstream from Middle, i.e. Bony and Upper remained clear with little or no algae bloom. Suggest DNR do their intensive nutrient load study such as being done on Whitefish Lake in Douglas County. Require all septic systems to be inspected and dye tested within one year.”

“I feel that the rule regarding grandfathering of failing and out of compliance septic systems and mound systems is definitely adding to the pollution of our lake quality. Also, the crowding of campers in campgrounds as well as adding number of sites without increasing and improving septic and other disposal problems is a major detriment.”

“Why do we have zoning if it is not enforced? How can the county give away a road without clearly indicating its intention to those involved? How can a public access be sold? Who profited from that?”

“If costs of belonging to association – would join again. We are over two hours away and don’t get up there real often. Minnesota takes \$2.00 from license fees to stock walleyes – we could use something like this to get walleye population back – along with no spearing.”

“That property owners main property after building permits checked out that it stays the way it was meant to be used.”

“The main reason for Barnes area housing boom is that we’ve been careful to control development. Ironically, prosperity and development can be the cause for future degradation of property values and quality of life. Caution now during our present time of transition in development can pay off later by preserving the very thing that made today’s prosperity possible, minimal development.”

“Thanks for sending me a questionnaire. Come visit us.”

“We choose to drive 6.5 hours to our lake home because of the feeling of wilderness, tranquility and roots. Our children come from across the U.S. to enjoy the quality of this area. We do not advocate a lot more regulation, but do feel the need for more control. Foreign species invasions are of high concern as well as over development and over use. We don’t want our lake to have the same problems as the local lakes around Milwaukee and Minneapolis, where over development, over population and over use are an ongoing problem. It’s always better to be proactive rather than reactive.”

“Should be only one family dwellings and 1.5 acres parcels only. Should be no condos.”

“Thank you for this survey. I think other residents, property owners will treat it seriously and thoughtfully – as have I.”

“Eurasian milfoil is the single biggest threat to the lake. Therefore, the public landing use should be restricted and all boats and other watercraft should be inspected at a gate. Consideration should be given to inspection of septic systems.”

“We feel Bony Lake is one of the headwaters to the Eau Claire Lakes with natural spring. The flow eventually ends up in the Mississippi River system. If something isn’t done soon to stop development and overuse from watercraft – this fragile Little Lake will be ruined forever.”

“I hope that the township/county government go by the property owners answers on this questionnaire regarding planned unit development and density of dwellings on the lakeshore. Otherwise, why do the survey.”

“I appreciate all the work the Eau Claire Lakes Property Owners Association has done in the past. I will rejoin when next newsletter comes. Thank you.”

“What good will this do.”

“A great survey and we want MEC Lake quiet and peaceful.”

“Keep up the good work.”

“We feel very strongly about the situation on the river between Middle/Lower Eau Claire. The Enchanted Inn has built very large docks that restricted the flow of the river and have caused severe difficulty due to sand build-up in getting our kayaks and fishing boat onto the lake. When approached, they are very negative to making changes. Using the Association to assist in vegetation and mediation between the Enchanted Inn and DNR would be fantastic. Also, their bridge that goes over the river is a danger to people in boats and as we understand, it is against code, yet no one enforces the code. We are very interested in helping resolve this issue as a collective effort.”

“Property owners do a really good job and also with information that concerns those of us who live out of town.”

“Lower Eau Claire has one public campground and two private campgrounds (mobile home) parks where trailers have skirting and decks, septic tanks and stay permanently parked year around this addition to the density on the lake or weekends whereby hundreds of people from each area are on the lake contributing to the lower condition of the lake while not paying any taxes or fees to help with any and all things in this area (lake, schools, roads, public access).”

“Our extended family has owned and visited the Barnes/Eau Claire Lakes area since the 1950s. Today, as non-resident, tax paying outdoors people, avid catch and release fishermen, and preservationists, conservation of the Eau Claire Lake is vital to us. Do we really want another overused, overbuilt, and overpopulated area like Eagle River, Minocqua or Lake Geneva? We need to remember: “man belongs to nature. Nature does not belong to man.”

“While this survey tends to only cover the lake where one resides, it overlooks the fact that this is a chain of lakes. We feel what affects Birch also affects the other small lakes (see A, E, H, J, and the overlooked Devil’s Lake). Engine and craft size isn’t what’s needed to protect these lakes – a speed limit is more effective – consider slow wake as used in the channels to protect weed beds and prevent stirring up the muck from the bottom. In over 50 years of ownership on Birch Lake, we didn’t notice the muck being disturbed until jet craft and high speed heavy bots appeared. The last five years has seen a lot of damage done to the shallow lakes that we hadn’t noticed before.”

“I believe in pursuing the look and the environment. My family has been coming up here for more than 70 years.”

“They are people that have one sided views – will not sway one way or the other. They are old people that are nosy, controlling. They have had a bad reputation and every year that they are around, the reputation gets worse. People up there want to enjoy a beautiful recreational area. That is what Wisconsin is all about - being friendly and neighborly. This group has no idea how to do that. The time for water skiing and jet skiing was changed legally by the government of

Barnes to 6:00. But no, it has to be at 5:00. So he is the one behind all this bullshit to get it changed back. Voting was fixed because people that have multiple properties only got one vote instead of one vote for each lot owned. Unfair.”

“Like to see more fish cribs or to help install.”

“Largest contributor to shoreline erosion is tubing behind power boats. The boats operate at lower than planning speeds causing large wakes that erode shoreline. Jet skis and water skiers operate at speeds of planning and above and throw much less wake.”

“Anyone on the lake is reasonably responsible for it. The lake could use some fish put in it.”

“Bravo. Good job for doing positive things instead of just complaining and seeing the situation get worse. Lakes can be cleaned up. Lake Erie is one superb example.”

“My time at the lake is decreasing while my children, who live in Minneapolis-St. Paul, is increasing. Time at the lake is sporadic. I will talk with my children.”

“Our property is a jointly owned family property. It is used by all members, but I am the closest. My siblings live in a much greater distances, so their help isn’t possible. But I would be willing to help on a limited basis although my ability to visit is also somewhat limited due to the distance also.”

“Jet skis disturb the peace and should have more restrictions on their use. Limit condos to larger lakes only and restrict the number per lake. No condo’s on small lakes like Sweet Lake. Inspect all washers/dryer systems on cabins. Two recent cabins on our lake sold in the last year and wash machine water was being pumped out to the ground near cabins and not in septic systems. New owners discovered this. Hundreds of gallons of soapy water was leaching into the lake.”

“Why new owners in the last three years allowed to build on 100 feet of lake frontage?”

“Our Association has good people that keep themselves informed. The annual meetings have people from many lakes and they present various subjects well. Thank you for your concern.”

“Limit jet ski use to Birch Lake and Robinson Lake to none at all, jet stream destroys the vegetation much worse than outboard motors.”

“I’m glad you’re doing this survey.”

“Control the deer population – destroy the young forest trees. Control size of boats and use of jet skis. Upper Eau Claire Lake is a beautiful setting we need to protect, maintain and preserve. Can we improve the fishing.”

“The Eau Claire Lake Chain has excellent water quality and the three big lakes are exceptional. They merit a high level of proper stewardship to offset the impacts of high summer usage. These lakes are also sensitive to human use impacts so measures to restore shorelines to native species, to let trees and bushes remain in the water for habitat and to curb urban-like landscaping should be implemented ASAP.”

“I think dense grass retains moisture runoff as good or better than typical undeveloped lake front.”

“I do not own property on the lake and do not have an opportunity to use it very often.”

“Two concerns. 1. Each year the lake bottom is being covered with dead vegetation – with a massive build-up over the years. The east end of the lake is being taken over by pickerel and lilies. 2. The boats being used for fishing are not coming from the lake property owners. At least 70% are coming in from the landing. The lake is not large enough to service all the area north of Barnes.”

“A season visitor now until I retire.”

“The town and county made a big mistake allowing a gravel quarry and hot mix plant to be put in operation at corner of SR27 and Peace Road. The noise from 5 a.m. to 9 p.m. is loud including dynamite blasting. Property Owners Association should lead an effort to reverse this decision by the county and town.”

“We think it’s not fair for boaters to have free garbage and the property owners (tax payers) have to pay for theirs.”

“The Town of Barnes has already taken surveys. Survey filled out by all property owners.”

“After enjoying 30+ years on Middle Eau Claire, it is very apparent the water clarity and quality has significantly suffered.”

“I strongly feel in education not regulation.”

“If you ask the real old timers that paid attention, you will find that there were not dense pines all crammed into the first 50 feet from shore like today. Their droppings of needles and pollen have affected the lake. We should encourage removal and replace with birch, oak poplar, etc. Even though I have two 2-cycle outboard motors, I would encourage to ban them 15 or 20 years from now. All that oil mixed in with gas gets vented through the prop and much is not burned. Stop the nice lawns to the lake edge grandfathered or not. Clean up Eleanor’s lawn/woods for her – use tax dollars. She spreads plenty of cash around for us. Give tax cuts to resorts that serve the residents needs. Most are gone. Bring them back – it’s what made this area fun in the old days. Get cell phone tower. Safety first.”

“This survey was a great idea.”

“Stop further restrictions to property owners. Most want to do proper maintenance of the lake they care for the lake. Restrict those that come for the day and don’t care to preserve quality. The town has gone overboard on restricting usage. I see you have a special question on jet ski use. We don’t own one, but the town should realize there only about 4-5 ski owned by property owners. One should worry about pontoon use and possibility of chopping up swimmer when they drive up 5

- feet from docks to look up into owners property. The lake saw minimal boating activity this summer. Gas prices and local ordinances have restricted usage.”
- “Appreciate the opportunity to have input. Trust this and other surveys, meetings, etc. are not part of a rubber stamp. Jump through the hoops. Types of exercises on your/our part that leads to an already predetermined litany of unneeded or extremely restrictive laws and regs some governmental agencies think we need and will ram down our throats. Please be careful of the belief by some feds, state gov. or even county and local that they know what is best for all of us.”
- “#31 – would support a requirement for 4-stroke motors.”
- “I have been enjoying the Lake Claire Lakes for 40 years. This lake was always known for being clear and sandy. But I have noticed in the last 3 years that there is more floating weeds in shoreline and Eau Claire murky bottom and I believe the decrease in Cray fish is playing a big part in the negative water change.”
- “Homeowners are disappointed in the lack of support from our local officials toward matters important to the homeowners. So many residents objected to the high density development on Bony Lake and were ignored by town officials and county officials. These were homeowners who elected the officials in the first place so they deserve more support. When a resident on the Bony/Middle channel had benzene in their well water no one from the town board or property owner’s association showed any concern or support. This is a very serious matter that could even affect future generations in their family.”
- “As I have indicated above, the water quality is degrading. At the boat ramp, a more safe docking facility could be added.”
- “Douglas County needs to become more proactive towards its lake and water sources. They need to look at enforcing more of its ordinances or looking to decrease density of shore land development. Our condo association permits a campground and its users to use our beach and shoreline and many ways there are many people using a small amount of shoreline (more than 20). Our condo does allow this. The county should look at campground usage and decrease the number of campers allowed. Enchanted Inn also has many campers and boats docked.”
- “I have vacationed in the Eau Claire Lakes for 60 years. My father owned a house on Robinson for over 27 years. The channels between the lakes had sand bottoms with very little weeds. Now the weeds almost choke the channels. I do not know what has caused this, but it is a problem.”
- “We love this little clean lake and its natural beauty – hopefully it will remain so.”
- “An issue not addressed in your survey was exotic species such as rusty Cray fish which are adversely affecting our lakes and fish habitat – it’s not just Eurasian milfoil that we need to worry about.”
- “This survey is a good idea, please sent out the results. We need better enforcement of ordinances – seems like some people just do what they want. No asphalt factory or gravel truck company. Keep the north the north – if they want city type or crowded lakes – go down south. Get all ATV’s off the roads and out of the woods. They destroy areas.”
- “I appreciate what the Lake Property Owners Association does to monitor the lakes and water for problems (and any others who do also).”
- “How, on earth, could the Barnes Association effectively study Eurasian water milfoil? What a waste of taxpayer money. I understand wanting to do something about water quality, but the opinions of people who are really interested in slowing boats and stopping jet skis for personal reasons is not the answer – it is much more complex. This survey seems geared to getting support for more control of lake property under the guise of improving lake water quality. I am in favor of clear lake water, but have specific scientific plans, not just opinions of people who probably do not know of what they speak.”
- “We see problems on the lake and contact the county and township. We’ve seen grey water systems (two on our lake) dumping washing machine water on the lakeshore. One sweet lake resident maintains a heavily fertilized lawn right to the waters edge and complains about the geese on it, but will not accept that her lawn is the problem. All these people need education as well as increased enforcement.”
- “The Lake Association are seasonal bigots who do very little to help the economic status of our community.”
- “Heavy spear fishing every year is ruining fishing quality. Why can’t they spear every other year or every two years.”
- “I just discovered this association at the Wisconsin Lakes Conference at Telemark this year. I would suggest a better campaign to make lakeshore owners aware of your group. Up to now, I only knew of the Conservation Club. We need all property owners to get involved, I think. I wish I had known of your association a long time ago. So glad you are here, you are doing what you have been doing. Thank you and involve me please. Don’t know what I can do, but I sure am willing to help – to try anyway.”
- “Recreational activities should be allowed after 6:00 p.m. The water usually looks like glass at that time and skiers and tubers would have a great time. The boat landing needs some serious improvements done. More fish in the lake would be great for the fishermen. Can you raise the bridge and fix the logs along either side of the channel to allow for easier access to the Upper Eau Claire Lake?”
- “Too many fishermen. Recreational fun short – the house should be extended. I would like to see more fish stocking. Robinson Lake needs a new blat landing (fixed). More placed to park and maintained. I would like more ATV trails around the lake. The bridge needs to be replaced and widened between Birch Lake and the Upper Eau Claire.”

“Control of crawfish – small mouth bass. Lower nutrient (septic) flowing into the lake.”

“I know we can’t go back 50+ years, but overdevelopment must be guarded against. What do you mean by responsible in question 22? Channels should be kept free flowing.”

“First, we strongly object to the decision that was made to allow a gravel pit industry and paving and gravel processing operation to wreck havoc on our peace and tranquility from 5:00 a.m. to 7:00 p.m. six days a week. How could the town have done this without input from all the property owners who are affected. Furthermore, the operation is draining our lake of its water, which is already low due to the severe summer. Where is this water going after it used for road surfacing. Does it end up in our watersheds, contaminated? Does it runoff into our lakes and streams? Secondly, a vegetative buffer does not work to control shoreline erosion in areas in which waves cause water to constantly beat along the shore. A rock barrier or a solid retaining wall are more efficient in controlling shoreline erosion. We have lost about 3 feet of shoreline over the last 5-7 years with a vegetative buffer. We have two answers to number 32 because I am a seasonal resident and my husband is a year-round resident.”

“This town is nothing like it used to be. They want laws, laws, laws, and more laws. I do believe they’d like it like the Stepford Comm. in that movie. The new people who have moved in are mostly from MN. There are 10,000 lakes in MN. Why don’t they park their behinds on one of those lakes? I’d love to be involved, but the new people who have moved in have taken over and you cannot tell them one thing. I was born and raised here and they seem to think they know more about the history of the town than we do. I’m not being mean, I’m just telling it like it is. All you hear is ‘well, we did it this way in Minneapolis, Baldwin, Eau Claire, St. Paul, Duluth, wherever.’ Then why did they leave those places? If they want to make it into something they left, why leave? They want police, police, police, and all the cops do is give you a ticket for 3 miles over the speed limit. If there was real trouble, they couldn’t handle it anyway. Now we have copes parked behind the town hall, the bank, etc., etc., just waiting for a speeding violation to occur. They demand blacktop roads all over the town. The town to me hasn’t become nicer, it’s just full of busy bodies. Also, they don’t drop much money in town. They want those paved roads so they can go to Hayward, Ashland, Rice Lake, Duluth, etc. That’s where they spend their money.”

“The Town Board, based on the northern paving fiasco, is obviously clueless about protecting the only real resources of the Barnes/Eau Claire Lake area – the lakes and quiet clean air. There already should be a fertilizer ban and ordinance to prohibit lakeshore property owners from installing asphalt driveways downhill to lake. We’ve owned the land for 10 years and have kept all 450 feet of shoreline natural and cut down no trees, while other owners have been allowed to do grass lawns right down to the shore.”

“I have owned by property on upper Eau Claire since 1968. It has remained and maintained a beautiful natural environment. It pleases me that your efforts to keep it that way are appropriately aggressive. Thank you.”

“This survey should have been done years ago.”

“I live on Birch, but fish on Robinson. Birch was dredged on a regular basis many years ago. It is in need of some dredging to increase fish populations (not just a hatchery).”

“I am very against the northland gravel development off of Highway 27 – horrible for eco and environment. Of course, it was money/politics at work, but they should not be there.”

“We have owned our property for 25 years. It has been in our family for over 60 years, bought by my great-grandparent in the 1930’s. It has a special meaning to us and I do not like all the dense building going on in the chain of lake area. The more people you allow on a piece of land, the more pollution and erosion you will have. The lakes are clear now, but in time overuse will destroy them.”

Appendix F

Citizen's Advisory Board Comments

TOWN OF BARNES
Bayfield County, Wisconsin



CITIZEN ADVISORY BOARD
GROUP RESULTS

Part of the Town of Barnes
Comprehensive Land Use Plan

February 18, 2004

With assistance from:

Cedar Corporation
604 Wilson Avenue
Menomonie, Wisconsin 54751

UW-Extension
PO Box 218
117 East 5th Street
Washburn, WI 54891

PARTICIPANTS

Group 1

David Thorson
Todd Ruprect
Michelle Ruprecht
David Pederson
David Pease
Sharon Moen
David Scharlau
Meg Thoreson
Leigh Jordahl
George Martin

Group 2

Bill Pence
Jeff Diedrich
Susan Diedrich
Carol Pease
Dick Collier
Troy Swanson
Darrin Jordahl
Ken Thoreson
Jim Johnson
Ronald Pearson

Group 3

Leslie Hall
Dixie Chermack
Duke Marten
Ron Moen
Russ Carter
Jim Johnson
Dick Collyard
Chris Webb
Gail Collier
Sue Wiesner

Group 4

Marie Hughes
Richard A. Hanson
Judy Neider
Donna S. Porter
Bobbie Pearson
Bonnie Dealing
Rita Johnson
Marcia Wellnitz

GROUP 1

WHAT ARE THE STRENGTHS OF THE TOWN OF BARNES?

1. Community Involvement
2. Forests (Vast and Accessable)
3. Clean Lakes
4. Clean Rivers
5. Good Retirement Area
6. Outdoor Recreational Opportunities
7. Friendly People
8. Kids (Good Place to Raise Them)
9. Fresh Air
10. Water Clarity (Clear Water)
11. Hand Operated Boat Lock
12. Friends
13. Citizen Rate
14. Northwoods Character
15. Peace and Quiet
16. Low Crime Rate
17. Low Traffic Volume
18. Public Services
19. High Environmental Concern
20. High Economic Resources
21. Tourism
22. Close Proximity to Metro Areas
23. Hunting
24. Quality Lake Living
25. Good Roads
26. Good School Funding

GROUP 1

WHAT AREAS OF THE TOWN OF BARNES NEED IMPROVEMENT?

1. More Public Swimming Areas/Picnic Areas
2. More Rec/Activities for Kids In the Town of Barnes
3. More Small Business/Industry
4. More Employment Opportunities
5. Better Lake Stewardship Attitudes
6. Property Tax Improvement (Slow Growth)
7. Meaningful Ordinance Enforcement
8. Trail Management Plans
9. Resolution between Residents and Seasonal (Residents)
10. Good Restaurants (No Bar)
11. Cell Phone Reception
12. Tourist Accommodations Needed
13. Less Wolves
14. School Busing Service
15. Medical (Walk-in Clinic)
16. Library/Community Center
17. Off-highway Parking
18. Good Restaurant With Lounge
19. Protect Public Boat Landings

GROUP 1

WHAT SHOULD THE TOWN OF BARNES LOOK LIKE IN 10-20 YEARS?

1. High Quality Lake Stewards
2. Self-Regulated Motorized Recreationists
3. Supportive Northwoods Character
4. Septic Tank Inspection Enforcement
5. Prosperous Economy
6. Clean and Accessible Lakes
7. Great Fishing
8. Better Landscape-Natural Environment (No Overdevelopment/Clear Cutting)
9. More Public Access to Lakes
10. More Buses
11. All Recreational Activities Open to the Public
12. Gas Tank Inspection Enforcement
13. Available Public Access to National Forest
14. Business District Confined to a Few Blocks
15. Thick and Full Forests
16. Smoke Free Restaurants
17. Barnes Post Office "Fresh Air, WI"
18. Natural Shoreline
19. Quality Environmental Protection/Bio-Diversity
20. Balanced Lake Usage
21. Forest Management Planning
22. Town Board Support of Lake Management
23. More Involved Town Board with Land Use Decisions

GROUP 2

WHAT ARE THE STRENGTHS OF THE TOWN OF BARNES?

1. Beautiful Lakes
2. Lots of Space
3. Quality Environment
4. Community Support
5. Air/Water Quality
6. Special Events
7. Location
8. Small Town Appearance
9. Lack of Industrial Pollution
10. Quietness/ Lack of Noise Pollution
11. Friendly People
12. Resort Community
13. Outdoor Recreation
14. Weather/ 4 Seasons
15. Lack of Major Businesses
16. Diverse Population
17. Lack of Dirty Industry
18. Good Snow Removal
19. No Traffic
20. Nice Quiet Trails
21. Great Wildlife
22. Churches
23. Good Hunting/Fishing

GROUP 2

WHAT AREAS OF THE TOWN OF BARNES NEED IMPROVEMENT?

1. Appearance of Downtown Area
2. Limits on Sprawl
3. Keep Small Town Atmosphere
4. Problem with Off-Highway Parking/Need More
5. Need for Grocery/Hardware Store
6. Road Repair/Grading
7. Enforcement of Current Zoning Regulations
8. Long Term Planning
9. Sign Regulation
10. Need for Small Business
11. More Lake Management
12. Lack of Sanding/Salting in Winter
13. Fertilizers Around Lake/Educate
14. Snow Plowing
15. Parks/Swimming Maintenance
16. High Speed Internet
17. Cell Phone Towers
18. Is there a need for Local Police?
19. Light Pollution
20. Review Law of Recreational Vehicles

GROUP 2

WHAT SHOULD THE TOWN OF BARNES LOOK LIKE IN 10-20 YEARS?

1. Maintain Small Town Atmosphere/Quaint (Town Wide)
2. More Focused Area of Downtown with Rural Area Surrounding
3. Unified Clean Look
4. More Business
5. Protect Air and Water
6. Need for Library
7. Need for Health Services
8. New Construction Blending with the Northwoods Environment
9. Effective Lake Quality Management Program
10. Recreation-Health Center/Community Center
11. Protect Trees/Propagation
12. Less Logging
13. Address Sanitary Issues
14. More Quality Lake Parks
15. Need for Senior Housing

GROUP 3

WHAT ARE THE STRENGTHS OF THE TOWN OF BARNES?

1. Tourists
2. Lakes
3. Friendly Atmosphere
4. Location
5. Land Mass
6. Good Living Area
7. Local Population
8. Peace and Quiet
9. Clean Air and Water
10. Small Community
11. Sandy Soil
12. Road Access
13. Woods
14. Retirement Community
15. Low Crime
16. Lack of Traffic
17. Tax Base
18. Community Involvement
19. Wildlife
20. Northwoods Character
21. Recreational Opportunities
22. A Lot of Organizations
23. Night Sky
24. Close Proximity of Larger Cities
25. Emergency Services
26. Good Town Government

GROUP 3

WHAT AREAS OF THE TOWN OF BARNES NEED IMPROVEMENT?

1. Senior Transportation
2. Improve Road Grading
3. More Activities for Children and Teens
4. Better Communication with Citizens
5. Paint Town Salt Shed
6. Septic Waste Disposal
7. Senior Affordable Housing
8. Stronger Business Association
9. Control Development
10. Plant More Evergreen Trees
11. Control Jet Skis
12. Need a Community/Senior Center
13. Ordinance to Control Eyesores (Junk Cars, etc...)
14. Job Opportunities
15. Campground
16. Library
17. Regulate Appearance of Pole Buildings
18. More Small Businesses
19. Control Excess Drinking
20. New Town Hall Building
21. New Cell Phone Building
22. Moderate Income Housing For Younger Working People
23. Ban Billboards
24. Bike Tail from Barnes to Drummond to Cable
25. Control Noise and Emissions from Industrial Park

GROUP 3

WHAT SHOULD THE TOWN OF BARNES LOOK LIKE IN 10-20 YEARS?

1. Air and Water Quality Improved or the Same as Now
2. Looks Like it Does Now
3. New Young Community Leaders with a New Vision
4. Small Town Atmosphere
5. Expanded Business and Recreational Opportunities and Expanded Housing Opportunities
6. Maintain Rural Environment
7. Keep Wooded Atmosphere
8. Clean, Natural with Planned Development
9. Retain Northwoods Beauty by Blending Homes and Businesses into the Woods
10. True Main Street
11. Have a Public Beach

GROUP 4

WHAT ARE THE STRENGTHS OF THE TOWN OF BARNES?

1. The People (Friendly/Diverse)
2. Limited Population
3. Clean Lakes
4. Quiet/Peaceful Living
5. Parks
6. Natural Environment
7. Proximity to Great Lakes/Twin Cities
8. Forests
9. Clear Air
10. Wildlife
11. Forward Thinking Local Government
12. Public Services
13. Road Accessibility
14. Seasons
15. Local Churches
16. No Industry
17. Fishing/Hunting
18. Snow Skiing/Quiet Recreation
19. Low Crime

GROUP 4

WHAT AREAS OF THE TOWN OF BARNES NEED IMPROVEMENT?

1. Zoning Enforcement
2. Activities/Services for Kids
3. Property Taxes
4. Expanded Town Hall/Community Center
5. Small Businesses to Retain Younger People
6. Employment Opportunities
7. Coffee Shop/Eating Opportunities
8. Roads
9. Cell Phone/High Speed Internet/Communications Infrastructure
10. Big Boats/Motors on Small Lakes
11. Town Signage
12. Senior Services
13. A Planned Downtown
14. More Rentals/Affordable Housing
15. Better Snow Plowing
16. Cleaning/Maintaining Environment
17. Fitness Center
18. Study/Management of Lakes
19. Stocking of the Lakes
20. Better Grocery Shopping Facility
21. Closed Areas to All Hunting

GROUP 4

WHAT SHOULD THE TOWN OF BARNES LOOK LIKE IN 10-20 YEARS?

1. Enforced/Planned Zoning
2. Multi-Use Community Center
3. Lakes Still Clean with Wild Edges
4. A Planned Downtown
5. Clean Environment (Pollution/Trash)
6. Reforesting in Devastated Areas
7. State of the Art Communications Infrastructure
8. More Businesses that Benefit the Town
9. Young Families Staying in Barnes
10. Northwoods Ambiance
11. Quiet Lifestyle Retained
12. Use of New Energy Technology
13. Environmentally Friendly Industry

COMPOSITE RESULTS OF ALL GROUPS

TOP PRIORITIES

WHAT ARE THE STRENGTHS OF THE TOWN OF BARNES?

1. Lakes
2. Clean air and water
3. Small town atmosphere
4. Good area to live
5. Forests

WHAT AREAS OF THE TOWN OF BARNES NEED IMPROVEMENT?

1. Lake management
2. Controlled development
3. Zoning enforcement
4. Community center
5. More small business

WHAT SHOULD THE TOWN OF BARNES LOOK LIKE IN 10-20 YEARS?

1. Maintained "small town" atmosphere
2. Maintain air and water quality
3. Clean and accessible lakes
4. Enforced/Planned Zoning
5. Centralized business district "Main Street"

We would like to thank everyone who participated in the Citizen Advisory Board meeting and appreciate taking your valuable time to take part in the formulation of the Town of Barnes Comprehensive Land Use Plan.

We hope you found the evening interesting and enjoyable and look forward to your continued participation.