

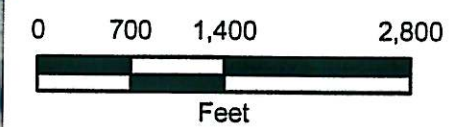
EXHIBIT 1

STORM WATER MANAGEMENT SYSTEM PLANNING AREA

VILLAGE OF FONTANA-
ON-GENEVA LAKE
WALWORTH COUNTY,
WISCONSIN

Legend

- Lower Rock River Watershed
- Municipal Boundary/Planning Area
- Water



5. Provide a comparative evaluation of the technical, economic and environmental features of the alternative system plans.
6. Recommend a cost-effective, comprehensive storm water management and water quality control system plan for the Village.
7. Identify the responsibilities to be assumed, and the actions required by, the various government units and agencies concerned to implement the recommended system plan.

The recommended storm water management plan incorporates compatible multiple-use elements and recognizes the constraints imposed by other community needs, such as urban land use, park and open space, transportation, sanitary sewerage and water supply development. Storm water management requirements were analyzed under existing, planned and full build out land use conditions and receiving stream channel conditions. The plan addresses both the storm water management facilities needed to serve areas that may be ultimately converted to urban use; and the rehabilitation, improvement, and maintenance of the existing storm water management system that currently serves the urbanized areas of the Village.

This report was prepared by the staff of Ruekert/Mielke working in cooperation with the Planning and Engineering Staffs of the Village. A Storm Water Advisory Committee composed of key members of public stakeholder groups and recommended by the Village Board, provided invaluable guidance and recommendations at meetings and acted as a conduit to the public throughout the project. The storm water management plan herein presented is set within the context of broader flood control and water quality management plans for the Geneva Lake watershed.

Planning Process

Storm water management system planning should take place within a broader, well-defined, orderly public planning process. That process should begin with the preparation of area-wide flood control and water quality management plans; proceed through the preparation of local storm water management system plans consistent with the area wide framework plans; and culminate in the preparation of construction plans and specifications for facility improvements identified in the system plan, and in the ultimate construction of those improvements.

The system-planning phase of this broader public planning process consists of five steps: inventory; analysis and forecast; plan design; plan test and evaluation; and plan selection and adoption. The process is designed to permit the principal functional relationships affecting storm water management system development to be described graphically and numerically; the performance of the storm water management system to be simulated; and the effects of different courses of action with respect to land use, resource management, to be tested and evaluated.

Inventory

Inventory is the first operational step in the system planning process. No intelligent forecasts of system performance can be made or alternative plans designed and evaluated without definitive knowledge of the state of the existing system. Sound storm water management

system planning requires collection of data on climate and weather; the hydrologic and hydraulic characteristics of streams and watercourses in the planning area; groundwater conditions; soil capabilities; the kind, location and intensity of existing and planned land uses; the location and capacity of existing storm water management facilities, and on the performance of those facilities. For the planning effort concerned, the inventory process included the collation of pertinent data from Village files; the conduct of personal interviews with knowledgeable public officials; the conduct of public information meetings; original field survey investigations and creation of a storm water structure inventory layer to be used with the Village's geographic information system (GIS).

Analysis and Forecasts

Inventories provide factual information about past and present conditions, but analyses and forecasts are necessary to define probable future conditions, particularly land use and system performance conditions. Future demands upon the storm water management system must be determined for interlocking forecasts of population and economic activity levels, land use development patterns, and other factors affecting storm water runoff. These demands can then be scaled against existing system capacities and targeted water resource uses and pollutant loadings to formulate plans to address deficiencies. The plan design period used in the system planning concerned extended to the year 2035 planned ultimate--or full build out--development conditions within the Village.

Plan Design

The storm water management system design problem requires a reconciliation among hydraulic and pollutant loadings derived from rainfall events; the existing and planned land use patterns; storm water management system design standards; existing storm water management facility capacities; and facility capital and operating and maintenance costs. The design process is one of successively approximating the best design solutions, proposing specific solutions for specific problems in each iteration, and then testing through simulation the operation of the proposed system with the proposed improvements by application of hydraulic and pollutant loadings. The procedure requires careful analyses to identify deficiencies in the existing system under existing and planned land use conditions, and thereby the system components requiring relief. Measures are then proposed to provide necessary relief; the measures tested by simulation; and the entire process repeated until a cost efficient system plan has been evolved.

Plan Test and Evaluation

If the system plan developed in the design step is to be realized in terms of facility development, simulation modeling should quantitatively test the performance of the plan. In addition, the economic viability of the plan should be evaluated. The system plan should also be evaluated on the basis of financial feasibility, environmental impacts, legality, and political acceptability. For the planning effort concerned, the plan test and evaluation process included--in addition to performance simulation under assigned hydraulic loadings--cost effectiveness evaluations through present worth analyses, the development of means of

financing, and the presentation of alternative plans to, and the review of those plans by, Village Staff and the Storm Water Advisory Committee.

Plan Selection and Adoption

The approach used to select a recommended plan from among the alternatives considered was to present the alternatives and the data on the technical, economic, financial and legal feasibility of each alternative at meetings with the Storm Water Advisory Committee. A preliminary recommended plan was then presented to the Village Storm Water Advisory Committee for review and recommendation to the Village Board. The final decision on plan adoption is, of course, the prerogative of the Village Board.

CHAPTER TWO FRAMEWORK PLANS

Introduction

Good engineering practice dictates that storm water management system planning, while properly conducted at the local level, also be conducted consistent with and supportive of plans and historical and environmental and legal actions within the broader framework of watersheds and subwatershed plans, including plans of immediately adjoining areas located within the watershed, in broader and more comprehensive plans that contain the watershed, and in environmental and legal actions made to protect and restore the quality of the watershed and its ecosystem services. Therefore, this planning necessarily includes an understanding of the watershed and groundwater system of which it is part, the contributions of groundwater and surface flows to the watershed and its associated wetlands and lake, certain historic framework planning efforts, and environmental and legal actions related to the quality of the watershed and its ecosystem services. These framework plans and actions are in addition to other local and regional ordinances, environmental and legal actions, and development requirements that would be applicable to the Village of Fontana-on-Geneva Lake.

Pertinent Framework Plans

The broader and more comprehensive framework plans of importance to the preparation of a new storm water management system plan for the Village are set forth in ten key documents which reflect the findings and recommendations of iterative regional and local planning processes extending back to 1991. These documents serve to make land use, flood control, and storm water management development recommendations contained in adopted county and local plans consistent with each other, and with adopted regional plans. Good planning and engineering practice requires such consistency. Such consistency is also important if certain proposed storm water management facility improvements are to receive necessary approvals under the State permitting process administered by the Wisconsin Department of Natural Resources.

The ten key framework-planning documents concerned are listed below, together with summaries of the salient, pertinent findings and recommendations contained in the documents.

1. Chapter NR 151, Wisconsin Administrative Code, October 2002.

Chapter NR 151 of the Wisconsin Administrative Code addresses nonpoint source pollution. It includes agricultural performance standards and prohibitions, non-agricultural performance standards, transportation performance standards, implementation and enforcement provisions, and a process to develop and disseminate non-agricultural technical standards.

Requirements for non-agricultural areas include implementation of an erosion and sediment control plan for most transportation projects and all construction and post-construction sites which disturb more than one acre; control of sediment and peak discharge rates, minimum infiltration requirements, protective buffer areas and fueling and maintenance area limitations for new developments.

2. Chapter NR 216, Wisconsin Administrative Code, August 2004.

Chapter NR 216 of the Wisconsin Administrative Code implements Phases 1 and 2 of the Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) program. It is intended to reduce, to the maximum extent practicable, the discharge of storm water pollutants into waters of the state from construction sites over 1 acre, designated municipalities and certain industrial facilities.

This code chapter provides the impetus for the NR 216 compliance portion of this storm water management plan. As a municipality outside an urbanized area, with a population less than 10,000 and a population density greater less than 1,000 people per square mile, the Village of Fontana-on-Geneva Lake is not required to obtain municipal storm water permit coverage.

- 3 The State of the Southeast Fox River Basin, Wisconsin Department of Natural Resources, February 2002.

The State of the Southeast Fox River Basin includes an evaluation of surface water resources, groundwater aquifers, aquatic habitat conditions, land use, development concerns, existing urban areas, storm water runoff and recreational uses; development of water use objectives; identification of non-point source water pollution control needs; and identification of implementation measures.

Recommended non-point source pollution reduction measures are targeted at public participation and education, watershed preservation, land use planning, agricultural pollution control, streambank erosion, aquifer recharge, outdoor recreation, water quality monitoring and urban runoff. Recommended actions specific to the Village of Fontana-on-Geneva Lake include preparation of a comprehensive storm water management plan, control of exotic and non-native plant species and reduction of non-point source pollution attributed to urban storm water runoff.

4. 2005 Annual Report, Southeastern Wisconsin Regional Planning Commission (SEWRPC).

The 2005 Annual Report incorporates 29 individual plan elements created in years past. The document is a comprehensive plan for the region, which provides the necessary framework for coordinating and guiding growth and development in a rapidly urbanizing region.

5. Community Assistance Planning Report No.135, A Park and Open Space Plan for Walworth County, SEWRPC, February 1991.

The Park and Open space plan for Walworth County is a land and facilities plan developed to preserve natural resources within environmental corridors and isolated natural resource areas, as well as provide the land and facilities needed to satisfy the recreational needs of the current and future 2020 resident population.

6. The Waterway, Wisconsin Lakes Partnership, March 2001.

The Waterway charts a course for the first decade of the twenty first century for the Wisconsin Lakes Partnership. Their vision is to use science and community goal setting to direct the protection and restoration of lake ecosystem and watershed health.

7. Village of Fontana-on-Geneva Lake Comprehensive Plan, September 2001.

This plan spells out the Goals, Objectives and Policies that the Village has adopted as a basis for its planning process for the future. The areas focused on in this plan are as follows; Community Image, Growth Management, Commercial Development, Environmental, Transportation and Pedestrian and Bikeway trails. This plan is recommended to be updated by 2010 to keep current with new state Smart Growth statutes.

8. Village of Fontana-on-Geneva Lake Comprehensive Plan - DRAFT, Vandewalle & Associates, August 19, 2009.

This draft plan is an updated comprehensive plan intended to preserve and protect the environment; identify areas for appropriate development and preservation for the next 20 years; recommend appropriate land uses; identify transportation and community facilities for the community; direct public and private investments in the Village and provide strategies to implement the recommendations of the comprehensive plan. A copy of the draft future land use plan from this plan is included in this study and was utilized when analyzing future storm water conditions.

9. Village of Fontana-on-Geneva Lake Indian Hills Stormwater Quality Management Report, Liesch Environmental Services, Inc., February 2008.

This plan lays out recommendations for controlling runoff volume and Total Suspended Solids for the Indian Hills subdivision in the Village of Fontana-on-Geneva Lake. Emphasis is placed on water quality. The recommended improvements included the construction of bio-retention and infiltration facilities adjacent to the navigable stream at the southeast corner of South Lakeshore Drive and Indian Hills Road; construction of bio-retention and infiltration on two upland parcels referred to as the Aweogon Road site, construction of a network of roadside and private property line swales; and construction or subsidizing of bio-retention structures on private properties that have low-lying areas that experience flooding.

10. Environmental Setting of the Upper Illinois River Basin and Implications for Water Quality, US Geological Survey, 1999.

This study is part of the US Geological Survey's National Water Quality Assessment program. This study is a compilation of environmental data from Federal, State and local agencies that provides a description of the environmental setting of the Upper Illinois River Basin.

Conclusions Regarding Framework Plans

In addition to the storm water management, flood control, and water quality management recommendations contained in the afore-referenced framework plans, hydrologic and hydraulic computations contained in engineering memoranda for individual, recently constructed or proposed, storm water management facilities in the Village were reviewed for potential applicability to the planning effort concerned.

CHAPTER THREE

STUDY AREA CONDITIONS

Introduction

In any system planning effort, definitive knowledge is required of the existing condition of the system concerned and of the pertinent characteristics of the environment in which the system operates. With respect to storm water management system planning in particular, inventories and analyses are required of such factors as the available topographic and cadastral mapping of the planning area; of existing socioeconomic and land use conditions in the planning area; and of the topography, drainage pattern, geology, climate and weather, water supply and natural resource base of the planning area. Definitive inventories and analyses are also required of the sanitary sewerage and existing storm water management facilities of the planning area.

Forecasts are required of those future events and conditions which may affect plan design and implementation. With respect to storm water management system planning in particular, the future needs which the plan must meet depend primarily upon future resident population and household levels within, and the attendant land use pattern of, the planning area. The flows to be accommodated by storm water management collection, conveyance, storage and treatment facilities are derived by application of facility design criteria and probable future land use patterns. The potential pollutant loadings from each basin are also largely dependent on the probable future land use.

Available Mapping

Walworth County, in cooperation with the Village of Fontana-on-Geneva Lake and the Southeastern Wisconsin Regional Planning Commission (SEWRPC) has completed horizontal and vertical control survey networks within U.S. Public Land Survey System Township 1 North, Range 16 East. The completion of these networks included the location, monumentation and placement on the Wisconsin State Plane Coordinate System, North American Datum of 1927, of all U.S. Public Land Survey system section and one-quarter section corners throughout the area concerned, and the establishment of reference benchmarks and elevations referred to the National Geodetic Vertical Datum of 1929. The control networks have subsequently been updated to the North American Datum of 1983 (NAD 83). These two control survey networks provided the basis of all mapping and field surveys used in the conduct of the storm water management system study and in the preparation of the new storm water management system plan for the Village.

Walworth County, in cooperation with the Village, and SEWRPC, in 2007 completed one-inch equals 200 feet scale, 2 foot contour interval, topographic maps of all of U.S. Public Land Survey System Township 1 North, Range 16 East. These maps are compiled by U.S. Public Land Survey System quarter sections, and are based upon the afore-referenced control survey networks, meet National Map Accuracy Standards, are available in digital and hard copy format, and provide data essential to the conduct of the requested storm water management system study and preparation of a new storm water management system plan for the Village.

The planimetric details from the available large scale topographic maps were assembled into a seamless, digital base map of the entire storm water management planning area. A reduced copy of this planimetric map, to which 10 foot interval contour lines have been added, is provided on Exhibit 2.

Walworth County, in cooperation with the Village, also completed one inch equals 100 and 200 feet scale cadastral maps of all of U.S. Public Land Survey System Township 1 North, Range 16 East. The maps are current with respect to the location and configuration of all real property boundary lines shown through the end of 2008. The maps are based upon the afore-referenced horizontal control survey network and upon ground truth provided by the planimetric data shown on the afore-referenced topographic maps. The cadastral maps are available in digital and hard copy format. The available large scale cadastral maps were also assembled into a seamless digital cadastral map of the storm water management planning area. A reduced copy of the cadastral map for the planning area is shown on Exhibit 2. The large scale topographic and cadastral maps match precisely and can be overlaid for analytical and data display purposes.

The topographic and cadastral base mapping was supplemented as necessary by available large scale aerial orthophotography available in computer manipulatable, digital form from Walworth County. This orthophotography was prepared from aerial photography taken in 2005 and meets National Map Accuracy Standards.

Land Use

The existing land use pattern is another important consideration in the preparation of a storm water management systems plan. The Southeastern Wisconsin Regional Planning Commission maintains an existing land use inventory by U.S. Public Land Survey system one-quarter section. The resulting data can be assembled for special purpose planning areas such as storm water management system planning areas. The existing land use pattern in the Village of Fontana-on-Geneva Lake storm water management system planning area as of 2000 is shown on Exhibit 3. 49 percent of the planning area was in urban uses in 2000 and about 51 percent was in rural uses. Residential uses comprised about 43 percent of the urban uses; while natural areas comprised about 16 percent of the rural uses. The natural areas constituted environmental sensitive open areas that should be preserved in essentially natural open uses.

The further conversion of rural uses to urban uses within the Village may be expected to increase both the rate and volume of attendant storm water runoff. However, the Village storm water management ordinance requires that the peak rate of runoff generated under proposed development conditions be restricted to the peak rate of runoff generated under existing land use conditions. To meet this requirement and the requirements of Chapters NR 151 and NR 216 of the Wisconsin Administrative Code necessitates the provision of detention storage, infiltration or other innovative storm water management techniques. In the undeveloped, areas of the Village this will be feasible at a cost; in the developed areas of the Village implementation will be more difficult.