SEWRPC Staff Memorandum

SCOPE OF WORK FOR OAK CREEK WATERSHED RESTORATION PLAN

March 2, 2015

INTRODUCTION

This memorandum is provided in response to a request from Milwaukee County, the City of South Milwaukee, and the Milwaukee Metropolitan Sewerage District (MMSD) to establish a scope for the proposed restoration plan for the Oak Creek watershed. In addition to a detailed description of the plan components, this scope of work includes an estimated cost to assist the units of government in the watershed in investigating possible sources of funds, and a tentative project schedule.

The watershed is located entirely within Milwaukee County and includes portions of the Cities of Cudahy, Franklin, Greenfield, Milwaukee, Oak Creek, and South Milwaukee (see Map 1). The preparation of this second-level plan will be done within the context of the Southeastern Wisconsin Regional Planning Commission (SEWRPC) regional water quality management plan update for the greater Milwaukee watersheds (RWQMPU),[1] which was prepared in coordination with, and largely incorporates, the MMSD 2020 facilities plan.[2] The watershed restoration plan will provide specific, targeted recommendations to address a set of focus issues related to conditions within the watershed. As described below, the plan will be designed to address the nine elements of a watershed-based plan as identified by the U.S. Environmental Protection Agency (USEPA), and to provide a guide for addressing the water quality impairments that have been identified in the watershed.

The identification of focus issues related to the watershed began at two intergovernmental meetings convened by Milwaukee County Supervisor Patricia Jursik in 2011. The results of those meetings are summarized in a January 10, 2012, SEWRPC staff memorandum entitled, "Approaches to Addressing Water Resource-Related Issues in the City of South Milwaukee in the Oak Creek Watershed." The staff memorandum identifies the following general issues of concern:

- Debris and sediment accumulations in the Oak Creek channel,
- Streambank erosion,
- City and County maintenance responsibilities within the Oak Creek channel,
- Flooding of low-lying areas, such as the South Milwaukee High School athletic fields (baseball diamond on the west side of 15th Avenue and football field and track on the east side), and washouts of the foot bridge connecting neighborhoods west of the High School/Middle School campus near Beech Street,

[1] *SEWRPC Planning Report No. 50,* A Regional Water Quality Management Plan Update for the Greater Milwaukee Watersheds, *December 2007.*

[2] *Milwaukee Metropolitan Sewerage District,* MMSD 2020 Facilities Plan, *June 2007.*

- Sanitary sewer backups into basements,
- The effects of land use changes throughout the watershed on sedimentation, streambank erosion, stormwater runoff, flooding, and sanitary sewer backups,
- The condition of the Mill Pond along the Creek in the City of South Milwaukee, and
- Lake Michigan bluff stability at a location in Grant Park where significant bluff erosion is occurring.

Many of those issues were also raised during a January 8, 2015, meeting at South Milwaukee City Hall (see Table 1 for a list of those in attendance) that was convened by South Milwaukee Mayor Erik Brooks and Supervisor Jursik. Based on the input from those who attended the January meeting, the following four major focus areas emerged for this watershed restoration plan:

- Water quality,
- Recreational access and use,
- Habitat conditions, and
- Targeted stormwater drainage and flooding issues.

In addition, the status of the Mill Pond and the associated dam would be addressed considering their relationship to multiple focus issues.

It is proposed that Milwaukee County and the City of South Milwaukee lead this watershed restoration planning effort, and that an Advisory Group be formed. The membership of that Group would include representatives from Milwaukee County; each of the municipalities in the watershed (the Cities of Cudahy, Franklin, Greenfield, Milwaukee, Oak Creek, and South Milwaukee); MMSD; the Wisconsin Department of Natural Resources (WDNR); the USEPA; the Friends of the Mill Pond & Oak Creek Watercourses, Inc.; the Restore the Lagoon organization; the Root-Pike Watershed Initiative Network; the Southeastern Wisconsin Watersheds Trust, Inc. (Sweet Water); the Milwaukee Area Land Conservancy; Milwaukee Riverkeeper; and the UW Cooperative Extension. That group would meet throughout the course of the study to provide input on the plan, including detailed review and comment on each preliminary draft chapter of the report, which would be prepared by the SEWRPC staff, and would be documented in a SEWRPC Community Assistance Planning Report.

It is also proposed that watershed stakeholder meetings be held periodically to update those interested in watershed issues on the progress of the plan and to present summaries of ongoing planning activities. Those meetings would be open to the public at large, and organizations and citizens with interest in the watershed would notified using interested party lists developed by the Root-Pike Watershed Initiative Network[3] and others. Attendance at those meetings by members of the Advisory Group would be encouraged.

[3]*The Root-Pike Watershed Initiative Network area of interest includes the Oak Creek watershed, the Pike River watershed, the Root River watershed, and the Lake Michigan direct drainage area from the mouth of Oak Creek at Lake Michigan south to the Wisconsin-Illinois state line.*

BACKGROUND

As shown on Map 2, the Oak Creek watershed encompasses about 27 square miles in Milwaukee County. The mainstem of the Creek originates in the City of Franklin and flows approximately 13.8 miles in a generally easterly direction through the Cities of Franklin, Oak Creek, and South Milwaukee to its confluence with Lake Michigan in the City of South Milwaukee. The two main tributaries of Oak Creek—the North Branch of Oak Creek (approximately 5.8 miles long) and the Mitchell Field Drainage Ditch (approximately 3.3 miles long)– have their sources in the City of Milwaukee, and flow in a southerly direction to their confluences with the main stem of Oak Creek in the City of Oak Creek. Urban development comprises over half of the watershed area under existing conditions, and agricultural and open lands are scattered throughout the watershed. Under planned year 2035 land use conditions it is forecasted that the watershed would be essentially completely developed in urban uses, except for primary environmental corridors, consisting predominantly of woodlands, wetlands, and floodplain.

As part of the 2007 RWQMPU,[4] water quality conditions and sources of water pollution were assessed in this watershed.[5] This assessment included updating of several inventories and analyses, including inventories of point and nonpoint sources of pollution, analysis and summarization of water quality and biological conditions, analysis of channel and riparian corridor conditions, estimates of pollutant loads, and an evaluation of the achievement of water use objectives. This assessment also identified a number of major issues of concern facing the watershed. These included impairments subject to Section 303(d) of the Federal Clean Water Act. Since the RWQMPU was issued, the list of impairments has been updated. The current list of approved, or proposed, impairments along the entire main stem of Oak Creek includes degraded biological communities due to high total phosphorus concentrations (2012 WDNR 303(d) list as approved by USEPA); chronic aquatic toxicity, generally due to nonpoint source pollution (2012 303(d) list); and acute aquatic toxicity due to chloride (proposed by WDNR for addition to the 2014 303(d) list, not yet approved by USEPA). Other issues of concern identified under the RWQMPU include worsened instream water toxicity conditions related to polycyclic aromatic hydrocarbons (PAHs), pesticides, zinc, and copper; poor instream sediment quality conditions related to PAHs, zinc, copper, lead, and arsenic; high concentrations of fecal indicator bacteria all along the main stem of Oak Creek; the presence of a very poor quality fishery within the watershed; the presence of streambank erosion along significant reaches of the main stem of Oak Creek and the Mitchell Field Drainage Ditch and along all of the North Branch of Oak Creek; stream channel modification, concrete lining, and enclosure; and fragmentation of the aquatic and terrestrial habitat.

SCOPE OF PROJECT

The Oak Creek watershed restoration plan will build from the 2007 SEWRPC regional water quality management plan update for the greater Milwaukee watersheds (SEWRPC Planning Report No. 50), providing specific, targeted recommendations to address 1) improvements in water quality, 2) mitigation of streambank erosion, 3) recreational access to Oak Creek, and perhaps some of its tributaries, 4) improvement of the fishery, and 5) mitigation of fragmentation of aquatic and terrestrial habitat.

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[4] *SEWRPC Planning Report No. 50,* op. cit.

[5] *SEWRPC Technical Report No. 39,* Water Quality Conditions and Sources of Pollution in the Greater Milwaukee Watersheds, *November 2009.*

Early in the planning process, it is proposed to conduct an on-line survey of stakeholders to obtain input on issues facing the watershed, including identification of specific problem locations and possible mitigation projects to address those problems. Participants would be asked to identify the major issues regarding management of the watershed related to the plan focus areas of 1) water quality, 2) recreational access and use of the Creek, 3) habitat conditions, and 4) targeted stormwater drainage and flooding issues; to prioritize these issues; and to identify potential specific mitigation projects to address these issues. Notice of the survey would be sent to a large number of potentially interested parties, including representatives of all county and municipal governments that are wholly or partially within the watershed, the Advisory Group members, and those on the invitation list for stakeholder meetings.

The watershed restoration planning process will be similar to that followed for the recent watershed restoration plan for the Root River watershed that was prepared by SEWRPC in collaboration with Root-Pike WIN, Sweet Water, MMSD, Racine County, other county and municipal governments that are wholly or partially located in the watershed, the WDNR, nongovernmental organizations, and other groups and individuals representing a broad range of interests within the watershed, with funding for that planning effort provided by Racine County, MMSD, the Wisconsin Coastal Management Program, and the Fund for Lake Michigan.[6] However, it will be adapted to specifically address conditions within the Oak Creek watershed that will be identified through input from the Advisory Group and the stakeholder meetings. It is proposed that the plan address the following four focus areas:[7]

- Water quality,
- Recreational access and use,
- Habitat conditions, and
- Targeted stormwater drainage and flooding issues.

The plan will be developed for long-term implementation, but it will include specific recommendations some of which could be implemented soon after completion of the plan, assuming that funding is obtained. The plan will identify the highest priority actions that would be expected to cost effectively improve the water resources of the watershed. By implementing those high priority actions, implementing entities would be able to develop support and momentum among watershed interests and to demonstrate the potential of the plan to improve watershed conditions.

For the first three focus areas described in detail below—water quality, recreational use and access, and habitat—the watershed restoration plan will address the focus area through a process of refining, detailing, and extending the pertinent recommendations of the RWQMPU for the Oak Creek watershed. This process will begin with a summarization of those recommendations, an evaluation of implementation activities in the watershed since 2007, and an inventory of recent projects, programs, and initiatives in the watershed. Conditions in the watershed will be characterized on a geographic basis, incorporating available data collected since the analyses in the RWQMPU. This information will be used to develop

[6]*SEWRPC Community Assistance Planning Report No. 316, MMSD,* A Restoration Plan for the Root River Watershed, *July 2014.*

[7]*The status of the Mill Pond and associated dam would be addressed considering their relationship to multiple focus issues.*

objectives to be achieved by implementing the plan and to identify actions to be taken to meet those goals.

As described later in this scope of work, the plan will be designed to address the nine elements of a watershed-based plan identified by USEPA, and to provide a guide for addressing the water quality impairments that have been identified in the watershed.

Water Quality

The 2007 RWQMPU included a comprehensive analysis and evaluation of water quality conditions for the period from 1975 through 2001 where sampling data were available for the Oak Creek main stem and its tributaries. That analysis identified several problems and issues related to water quality in the watershed.[8] Concentrations of dissolved oxygen along the Oak Creek main stem have generally been decreasing over time, although, with the exception of the farthest upstream sampling site at Ryan Road, measured concentrations have generally equaled or exceeded the applicable State water quality criterion of 5 mg/l for fish and aquatic life. Concentrations of total phosphorus along the main stem of the Creek have increased somewhat over time. In the upstream 4.6-mile-long reach of the Creek upstream of STH 38 and the downstream 2.6-mile-long reach downstream of 15th Avenue, total phosphorus concentrations have generally been lower than in the middle reach from STH 38 downstream to 15th Avenue.[9] At sampling locations along the mainstem of the Creek, mean concentrations of chlorides have been increasing over time. Also, chloride concentrations decrease from upstream to downstream along the Creek. These concentrations occasionally exceed the State's chronic toxicity criteria for fish and aquatic life, but rarely exceeded the acute toxicity criterion. High concentrations of fecal coliform bacteria are present along the Creek, and in general, there have been no increasing or decreasing trends over time, or along the Creek from upstream, to downstream. These concentrations often exceed the State's criterion for recreational use. Fecal coliform bacteria counts generally tend to be highest during the May to September swimming season.

In the development of the watershed restoration plan, a variety of management strategies will be considered for improving water quality conditions in the Oak Creek watershed. Examples of management strategies that could be considered for inclusion as recommendations include road salt reduction programs and measures related to management of stormwater, including reduction of impacts from urban and agricultural stormwater runoff.

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[8] *SEWRPC Technical Report No. 39*, op. cit.

[9] *The phosphorus planning standard concentration applied by SEWRPC since the initial regional water quality management plan was published in 1979 is 0.1 mg/l, In 2010, the State of Wisconsin developed water quality criteria for concentrations of total phosphorus. For most streams in the State, including the streams of the Oak Creek watershed, the new rule establishes a criterion of 0.075 mg/l. For lakes the rule establishes criteria ranging from 0.015 mg/l to 0.040 mg/l, depending upon the drainage and stratification characteristics of the lake. For the nearshore and open water areas of Lake Michigan, the rule establishes a criterion of 0.007 mg/l. Ephemeral streams, lakes and reservoirs with surface area of less than five acres, and waterbodies classified as limited aquatic life communities are specifically exempted from the rule. In addition, the new rule includes provisions and procedures for the development of site-specific total phosphorus water quality criteria. The rule was approved by the Wisconsin Natural Resources Board and became effective by January 1, 2011. The watershed restoration plan will evaluate phosphorus concentrations in the Oak Creek watershed in accordance with the new State rule.*

Recreational Access and Use

During the January 8, 2015, scoping meeting, recreational access to, and use of, surface waters and riparian areas was identified as an important consideration in the Oak Creek watershed. Developing opportunities for canoeing and fishing, both upstream and downstream from the South Milwaukee Mill dam, were mentioned.

The 2007 RWQMPU identified problems related to recreational access to, and use of, the surface waters and riparian areas of the Oak Creek watershed.[10] The watershed was found to have a very poor quality fishery. The streams of the watershed have historically contained a low abundance and diversity of fishes. The fish community is trophically unbalanced, contains few top carnivores, and is dominated by fish species that are tolerant of poor water quality conditions. Factors that contribute to the poor quality of the fishery include water quality, the effect of the Mill dam in disconnecting most of the watershed from Lake Michigan, internal fragmentation of the stream system due to fish passage barriers, channelization of many stream reaches, and poor to fair habitat quality.

An important consideration in the recreational use of surface waters is the safety of these waters for human contact. Waters used for recreational purposes must be free of the pathogens responsible for human diseases. The concentration of fecal coliform bacteria serves as an indicator of the suitability of surface waters for human contact. As discussed in the previous section on water quality, concentrations of this indicator in Oak Creek frequently exceed the State's standard for recreational use. To improve recreational access to and use of surface waters in the watershed, the watershed restoration plan will need to address inputs of bacteria to waterbodies of the watershed.

In the development of the watershed restoration plan, a variety of management strategies will be considered for increasing recreational access and opportunities in the Oak Creek watershed. Examples of strategies that could be considered for inclusion as recommendations include expanding views and safe use and access to the stream corridor, improving water quality and habitat for fishes and wildlife, establishing instream and riparian activities that engage users, improving navigational opportunities and safety, and increasing the connection of the stream system and its associated parkways to other landscape features through a system of roads, trails, paths, and waterways. The plan will also consider pertinent elements of the draft Milwaukee County park and open space plan and the City of Milwaukee/Milwaukee County Copernicus Park Master Plan.[11] Because of the critical need to keep waters used for recreational purposes free of the pathogens responsible for human diseases, the plan will also include recommendations toward reducing inputs of bacteria to surface waters of the watershed.

Habitat Conditions

The 2007 RWQMPU identified several problems and issues related to habitat conditions in the Oak Creek watershed.[12] Some of these were identified as potentially limiting the quality of the fishery. These included fragmentation of aquatic habitat due to barriers to passage (e.g., at road crossings, or instream drop structures), past channelization of watercourses, areas of streambed and streambank erosion, and limited channel enclosure and concrete lining. With the exception of the Mitchell Field Drainage Ditch

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[10]*SEWRPC Technical Report No. 39*, op. cit.

[11]*City of Milwaukee and Milwaukee County Parks*, Copernicus Park Master Plan, *prepared by Terra Engineering, December 2014. This plan also relates to the stormwater and flooding focus area.*

[12]Ibid.

subwatershed, riparian buffers greater than 75 feet in width were found to be widely distributed throughout the watershed.[13] Such buffers, when in a more natural state, serve to improve terrestrial and instream habitat, and can improve water quality conditions where diffuse flow of stormwater runoff can be attained.

In the development of the watershed restoration plan, a variety of management strategies will be considered for improving habitat conditions in the Oak Creek watershed. Examples of measures that could be considered for inclusion as recommendations include land-based measures, such as recommendations for expanding, enhancing, and connecting riparian buffers and identifying high-quality habitat areas. Other measures that will be considered for incorporation will include instream-based measures to increase aquatic organism passage, reduce streambank and streambed erosion, and restore aquatic organism habitat.

Stormwater and Flooding

Input during the January 8, 2015, plan scoping meeting identified flooding and stormwater drainage problems as important issues of concern in the watershed. Specific problem areas mentioned during the scoping meeting included an area in the extreme southwestern part of the City of Cudahy in the vicinity of the Union Pacific Railroad and E. College Avenue[14] and along the main stem of Oak Creek in the City of South Milwaukee where flooding of the high school athletic fields occurs.

MMSD has jurisdiction for flood mitigation activities in the portion of the watershed outside of the City of South Milwaukee.[15] The streams under MMSD jurisdiction include:

- An approximately 8.4-mile-long reach of the main stem of Oak Creek extending from W. Southland Drive the City of Franklin to S. Pennsylvania Avenue at the boundary between the Cities of Oak Creek and South Milwaukee.

[13]*Much of the riparian land along the main stem of Oak Creek is Milwaukee County park land.*

[14]*In December 2011 when the January 10, 2012, SEWRPC staff memorandum mentioned previously was being prepared, Supervisor Jursik provided the SEWRPC staff with a November 30, 2011, memo from the Milwaukee County staff describing this stormwater drainage problem. The problem relates to historical filling of lands downstream of an 80-acre industrial park located in the City of Cudahy in the Mitchell Field Drainage Ditch subwatershed. A Union Pacific Railroad culvert had been blocked, a relief overflow path for stormwater runoff over E. College Avenue (CTH ZZ) was restricted when the grade of E. College Avenue was raised, and a possibly undersized culvert pipe was installed by the County downstream of the railroad culvert. Those restrictions on the conveyance of stormwater runoff to the Mitchell Field Drainage Ditch result in ponding of runoff on the Industrial Park site during large rain storms.*

[15]*The City of South Milwaukee is the only community in Milwaukee County that maintains its own wastewater treatment facility and does not belong to the Milwaukee Metropolitan Sewerage District. Thus, flood mitigation relative to streams within the City of South Milwaukee are not directly addressed under the MMSD watercourse program.*

- An approximately 5.7-mile-long reach of the North Branch of Oak Creek extending from a culvert under the most southerly crossing of the Airport Spur freeway downstream to its confluence with the main stem of Oak Creek.

- An approximately 3.3-mile-long reach of the Mitchell Field Drainage Ditch extending from the intersection of S. Howell Avenue and E. Citation Way downstream to its confluence with the main stem of Oak Creek.

Problems related to potential damage to buildings along the indicated reaches of the main stem of Oak Creek, the North Branch of Oak Creek, and the Mitchell Field Drainage Ditch are being addressed through the MMSD watercourse planning program using the floodplain maps prepared by the SEWRPC staff under a mapping program for the Milwaukee County Automated Mapping and Land Information System Steering Committee and MMSD. Thus, while those ongoing watercourse planning programs will be summarized in the watershed restoration plan, riverine flood mitigation alternatives and recommended plans will not be developed under this planning effort.

In addition to flooding of buildings from the overflow of streams, stormwater flooding is another potential source of water-related damage. Such flooding occurs when rainfall and/or snowmelt runoff traveling from the land surface toward streams cannot be safely conveyed and/or stored and buildings are flooded.

The final scope of flood mitigation and stormwater drainage planning activities to be undertaken for the watershed restoration plan outside of areas addressed under the MMSD watercourse planning program will be determined based on discussions with the staffs of each of the cities within the watershed and on review of the Milwaukee County pre-disaster mitigation plan.[16] It is proposed to evaluate up to six flooding and/or stormwater drainage problems identified through that process. The plan will not include detailed flooding and/or stormwater drainage analyses for each of the six identified problem areas, but the problems will be characterized, and possible alternative approaches to address the problems will be identified for further study by the respective cities under planning efforts other than the watershed restoration plan. The SEWRPC staff will contact the Cities of Cudahy, Franklin, Greenfield, Milwaukee, Oak Creek, and South Milwaukee to further ascertain the extent of flooding and stormwater drainage problems within the watershed.

South Milwaukee Mill Dam

The plan will include an evaluation of the status of the South Milwaukee Mill dam located on the main stem of Oak Creek in the City of South Milwaukee about one mile upstream from Lake Michigan. That evaluation will include development of a range of alternatives relative to the dam and the Mill Pond. It is proposed that those alternatives include:

- Maintaining the dam and restoring the recreational and ecological functions of the Mill Pond, including addressing sediment accumulation

- Maintaining the dam, restoring the recreational and ecological functions of the Mill Pond, including addressing sediment accumulation, and providing fish passage from the downstream side of the dam into the Mill Pond

[16] *Milwaukee County Emergency Management,* Milwaukee County, Wisconsin Pre-Disaster Mitigation Plan, *June 2011*.

- Removing the dam and restoring a free-flowing stream

An evaluation of the status of the dam would involve consideration of each of the four watershed restoration plan focus areas (water quality, recreational access and use, habitat, and flooding). Sufficient analyses will be performed to evaluate the feasibility of each alternative in the context of the focus areas and to estimate the capital and annual operation and maintenance costs. The decision on which alternative, if any, to implement rests with Milwaukee County, the owner of the dam.

U.S. ENVIRONMENTAL PROTECTION AGENCY NINE ELEMENTS OF A WATERSHED-BASED PLAN

As part of its approach to watershed planning, the USEPA has identified a set of nine minimum elements that it considers critical for achieving improvements in water quality.[17] These elements are listed in Table 2. USEPA requires that these elements be addressed in watershed-based plans for threatened and impaired waters that are developed or implemented with funding through Section 319 of the Federal Clean Water Act. USEPA also recommends that these elements be included in all other watershed plans intended to address water quality impairments.

The Oak Creek watershed restoration plan will be designed to address the nine elements identified by USEPA, and to provide a guide for addressing the water quality impairments that have been identified in the watershed. As noted previously, the entire 13.0-mile length of the mainstem of Oak Creek is listed, or proposed to be listed, as being impaired due to chronic aquatic toxicity, generally due to nonpoint source pollution; acute aquatic toxicity related to chloride; and degraded biological communities related to total phosphorus. A combination of point and nonpoint sources is cited as factors contributing to the impairment of the Creek. This plan will also provide recommendations to address the high concentrations of fecal indicator bacteria found in surface waters of the watershed. While recreational use impairments pursuant to Section 303(d) of the Federal Clean Water Act have not been identified in the Oak Creek watershed, the high concentrations of fecal indicator bacteria suggest that they may be placing limits on the suitability of surface waters in the watershed for recreational uses.

PROJECT TASKS

Task 1—Summarize the Recommendations of the Regional Water Quality Management Plan Update as They Relate to the Oak Creek Watershed

The recommendations of the RWQMPU will be used as a starting point for the watershed restoration plan. Although implementation of these recommendations is not expected to result in meeting water quality standards for all pollutants in all areas of the watershed, achieving them will provide a significant incremental step towards water quality and habitat improvement. The recommendations of the RWQMPU applicable to the Oak Creek watershed will be summarized and described. These recommendations will be considered when developing alternative approaches to address the objectives established for each focus area.

[17] *U.S. Environmental Protection Agency*, Handbook for Developing Watershed Plans to Restore and Protect Our Waters, *USEPA Publication EPA 841-B-008-002, March 2008.*

Task 2—Evaluate Implementation of the Recommendations of the Regional Water Quality Management Plan Update for the Oak Creek Watershed Since 2007

The watershed restoration plan will evaluate implementation since 2007 of the management strategies recommended in the RWQMPU and the MMSD 2020 Facilities Plan for the Oak Creek watershed. This evaluation will divide the recommended strategies into three groups: existing strategies for which there are regulatory requirements, other strategies which are in various stages of implementation, and management strategies that were recommended for implementation under the RWQMPU, but which have not yet been implemented. For each recommended management strategy, this evaluation will include a determination of which focus areas are addressed, the responsible and potentially participating agencies and organizations, and the status of implementation. This will serve as a basis for developing additional, and more detailed, management strategies for achieving the desired objectives.

Task 3—Inventory Recent and Ongoing Projects, Programs, and Initiatives and Integrate These into the Recommendations

An important issue to be addressed during the development of this watershed restoration plan is how to best integrate other ongoing watershed management efforts with this effort. To facilitate this, recent and ongoing watershed management projects, programs, and initiatives in the Oak Creek watershed will be inventoried. Those efforts that are consistent with and complement the focus areas of the watershed restoration plan will be integrated into the plan. This evaluation will also consider pertinent information and studies being developed by MMSD under its ongoing 2050 facilities planning process.

Task 4—Characterize the Watershed, Concentrating on Features Related to the Focus Issues

The development of the watershed restoration plan will include a characterization of the surface waters and related features of the Oak Creek watershed. This characterization will represent a refinement and updating of the inventories in the RWQMPU[18] and will consist of an inventory and analysis of those watershed characteristics most relevant to the focus issues. The relevant characteristics will be summarized and updated based upon existing data collected since 2001. As part of the refining process, this characterization will be done geographically within the watershed. To the extent that available data allow, the characterization will be presented for the assessment points and assessment point areas used in the watercourse modeling used to develop the RWQMPU.[19] Examples of characteristics that for which data will be reviewed or obtained include land use; surface water and groundwater resources; elements of the natural resource base; surface water quality and pollutant loading data; biological conditions; an inventory of the physical properties of the stream channels and of streambank erosion characteristics along the main stem of Oak Creek, with inventories of selected sites along the North Branch of Oak Creek and the Mitchell Field Drainage Ditch;[20] recreational facilities and access; and flooding records. This characterization will incorporate results from ongoing monitoring efforts being conducted by the MMSD, WDNR, U.S. Geological Survey, and City of Racine Health Department, to the extent practicable.[21]

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[18]Ibid.

[19]*SEWRPC Planning Report No. 50,* op. cit.

[20]*This inventory effort will incorporate information from a 2003 Milwaukee County study assessing stability and fluvial geomorphologic character of streams within the Oak Creek watershed, supplemented by field data collected by the SEWRPC staff.*

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[21]*The City of Racine Health Department has submitted a grant application to the Fund for Lake Michigan for water quality sampling at 16 locations (11 on the main stem of Oak Creek, two on the North Branch of* *(Footnote Continued on Next Page)*

Task 5—Develop Plan Objectives
These will be developed in the context of the Principles, Objectives, and Standards established for the RWQMPU planning effort, and they will relate to the four plan focus areas.

Task 6—Develop Alternative Approaches to Meeting the Plan Objectives
This task will be structured by focus area, and will involve identifying issues that must be addressed, formulating alternative approaches, evaluating the alternatives relative to how well they address the plan objectives, and selecting a preliminary recommended alternative approach, or approaches, for each focus area.

Task 7—Synthesize a Recommended Plan
The recommended plan will be developed from the preliminary recommended alternatives. To provide the plan implementing agencies with a guide to putting the plan into effect, it is important that specific projects be identified for each focus area. These specific projects will be selected through review of existing pertinent local plans or studies (e.g., stormwater management plans, the Milwaukee County land and water resources management plan) and through stakeholder input from a public meeting at which those in attendance will be divided into groups by geographic area within the watershed to suggest specific project types and locations. That model for obtaining public input was successfully employed by the SEWRPC staff in developing the Root River watershed restoration plan.

The recommended plan will consist of 1) general recommendations that largely reflect recommendations made in previous planning efforts and 2) project-specific recommendations developed under this planning effort. Recommendations from previous planning efforts will be incorporated to promote consistency among currently active plans. Such planning efforts would likely include the RWQMPU, the Milwaukee county land and water resource management plan, the Milwaukee County hazard mitigation plan, local stormwater management plans, and the preliminary draft Milwaukee County park and open space plan.

The general recommendations will provide a framework for the identification of specific project recommendations included under the plan and for identification and implementation of future projects as opportunities arise. Thus, in many instances, the specific projects that are identified under the Oak Creek watershed restoration plan will serve to partially implement a general recommendation. In other instances, a general, less geographically-specific recommendation, will serve as an indicator of the types of projects that the implementing organizations should seek out as opportunities may present themselves in the future. An example of this would be a general recommendation to develop riparian buffers along a stream in a particular subwatershed. While at the time of development of the watershed restoration plan there may be no known property owners in the specific subwatershed that are interested in establishing buffers, the plan recommendation would serve to alert the plan implementing organization to follow developments in the subwatershed that could create the opportunities necessary to implement the buffer establishment recommendation. When such opportunities arise, specific projects can be implemented.

The pollutant removal effectiveness of appropriate, specific recommended projects will be evaluated using the USEPA Spreadsheet Tool for Estimating Pollutant Load (STEPL).

(Footnote Continued from Previous Page)
Oak Creek, two on the Mitchell Field Drainage Ditch, one on an unnamed tributary to the North Branch, and one in the Mill Pond). The sampling would be conducted from June 2015 through August 2016 and a final report is scheduled to be complete by the end of 2016. If that project is funded, the water quality data will be analyzed by the SEWRPC staff.

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The recommended plan will also include a monitoring element. This element will address both monitoring to evaluate progress in implementing the plan and monitoring to evaluate conditions in the watershed.

Task 8—Identify High Priority Recommendations
It is anticipated that an extensive list of specific project recommendations will be developed. To focus plan implementation efforts, shorter lists of high priority projects will be developed for each focus area.

Task 9—Develop Implementation Strategy
In a practical sense, the watershed restoration plan cannot be complete until the steps to implement it—that is, convert the plan into actions, policies, and programs—have been specified. This specification requires the identification of strategies to be pursued for implementing the plan. It also requires that several elements be addressed, including the identification of the agencies responsible for implementing various elements of the plan, estimation of the resources required to implement elements of the plan, and identification of potential sources of such resources. To accomplish this, the watershed restoration plan will present implementation strategies, estimate the amount of technical and financial assistance needed for implementation and the associated costs, identify the authorities that will be relied upon to implement the plan, and identify potential sources of technical and financial assistance for plan implementation. A detailed information and education program related to the plan will also be developed.

Task 10—Ongoing Advisory Group and Stakeholder Outreach
It is proposed that the Root-Pike Watershed Initiative Network (WIN) play a significant role in communications, public outreach, and identification and assembling of stakeholders. The SEWRPC and Root-Pike WIN staffs collaborated successfully on the Root River watershed restoration plan, with Root-Pike WIN having a similar role as proposed for the Oak Creek plan. The SEWRPC staff will prepare Advisory Group and stakeholder meeting agendas and will also establish the meeting schedule as the project proceeds. Specific tasks for Root-Pike WIN would include notifying Advisory Group members of meetings; widely distributing stakeholder meeting notices to organizations and citizens with interest in the watershed; and identifying and reserving Advisory Group and stakeholder meeting locations.

DOCUMENTATION OF THE PLAN

The plan will be described in a SEWRPC community assistance planning report, which will include an executive summary. The general report format will be similar to that of SEWRPC Community Assistance Planning Report No. 316, *A Restoration Plan for the Root River Watershed*, July 2014, which can be accessed at:

http://maps.sewrpc.org/Publications/search.asp?visit=1&keyword=Root&CompType=AND&reporttype=30&yearfilter=2014&Submit=Search

PROJECT BUDGET AND SCHEDULE FOR PLAN PREPARATION

Estimated project costs by task are set forth in Table 2. The overall cost of the study is estimated to be $542,900. $530,000 of that total would be for work by SEWRPC and $12,900 would be for outreach work by Root-Pike WIN. SEWRPC would contribute $___,000 in in-kind costs, leaving $___,000 to be

provided by the units of government with interest in the watershed. It is anticipated that those units of government would seek grant funds to cover all, or a portion of this cost.[22]

Table 3 gives a tentative schedule for the completion of these tasks. It is envisioned that the study will be conducted over about 2.5 years with the initiation of the study work by SEWRPC preceded by a seven-month period when the Racine County Health Department would initiate the proposed water quality monitoring program.

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[22] *As an example, the Root River watershed restoration plan was funded by the Milwaukee Metropolitan Sewerage District, Racine County, a Wisconsin Coastal Management Program grant obtained by Racine County, a Fund for Lake Michigan grant obtained by Sweet Water, and SEWRPC.*

Table 1

ATTENDEES AT MEETING TO DISCUSS THE SCOPE OF A POSSIBLE OAK CREEK WATERSHED RESTORATION PLAN

Name	Affiliation
Betsy Abert	Friends of Grant Park
David Bartoshevich	4th District Alderman, City of South Milwaukee
Kathy Briesemeister	Friends of the Mill Pond & Oak Creek Watercourse, Inc.
Eric Brooks	Mayor, City of South Milwaukee
Don Bulley	Friends of the Mill Pond & Oak Creek Watercourse, Inc.
Tom Chapman	Milwaukee Metropolitan Sewerage District
Vicki Elkin	Fund for Lake Michigan
Greg Failey	General Mitchell International Airport, Milwaukee County
Sharon L. Gayan	Wisconsin Department of Natural Resources
Frank Gratke	Aldermanic Candidate, City of South Milwaukee
Mike Hahn	SEWRPC
John Hohenfeldt	Mayor, City of Cudahy
Cara Jensen	Restore the Lagoon
Mike Jensen	Restore the Lagoon
Patricia Jursik	Milwaukee County Supervisor, 8th District
Steve Keith	Milwaukee County Environmental Services
Laura Kletti	SEWRPC
Mary Jo Lange	City of Cudahy
Craig Maass	Alderperson, City of South Milwaukee
Glenn Morrow	City of Franklin
Jackie Ove	City of South Milwaukee Health Department
John Rennpferd	Citizen
Brian Russart	Milwaukee County Parks
Kevin Shafer	Milwaukee Metropolitan Sewerage District
Mike Simmons	City of Oak Creek
Kyle Vandercar	City of South Milwaukee
Nancy Wucherer	Friends of the Mill Pond & Oak Creek Watercourse, Inc.

Source: SEWRPC.

Table 2

MINIMUM WATERSHED ELEMENTS TO BE ADDRESSED IN WATERSHED-BASED PLANS

Nine Minimum Elements for a Watershed Plan
1. Identification of the causes and sources of pollution in the watershed
2. Estimate of the load reductions needed to meet water quality standards
3. Description of the management measures to achieve the load reductions
4. Estimates of the amounts of technical and financial assistance and the relevant authorities needed to implement the plan
5. Development of an information and education component
6. Development of an implementation schedule
7. Description of interim, measurable implementation milestone
8. Identification of indicators to measure progress toward meeting water quality standards
9. Development of a monitoring component

Source: U.S. Environmental Protection Agency.

Table 2

SCHEDULE FOR OAK CREEK WATERSHED RESTORATION PLAN[a]

Task	2015							2016												2017												2018						
	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J
Anticipated Water Quality Sampling by Racine Health Department	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																		
1. Summarize RWQMPU Recommendations								■	■	■																											
2. Evaluate RWQMPU Implementation											■																										
3. Inventory Projects, Programs, Initiatives												■																									
4. Characterize Watershed												■	■	■	■	■	■	■	■	■	■																	
5. Develop Plan Objectives																						■	■	■													
6. Develop Alternatives																					■	■	■	■	■												
7. Synthesize Recommended Plan																									■	■	■	■									
8. Identify High Priority Recommendations																													■								
9. Develop Implementation Strategy																													■	■	■						
10. Ongoing Outreach	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Review by WDNR and USEPA																																■	■	■	■	■		
Publish Report																																			■	■	■

[a] *This schedule assumes 1) that the Racine County Health Department water quality sampling project is funded and begins as scheduled in June of 2015 and 2) that the units of government with interest in the watershed are able to provide the required level of funding so the work by the SEWRPC staff can begin in January of 2016.*

Source: SEWRPC.

Table 3

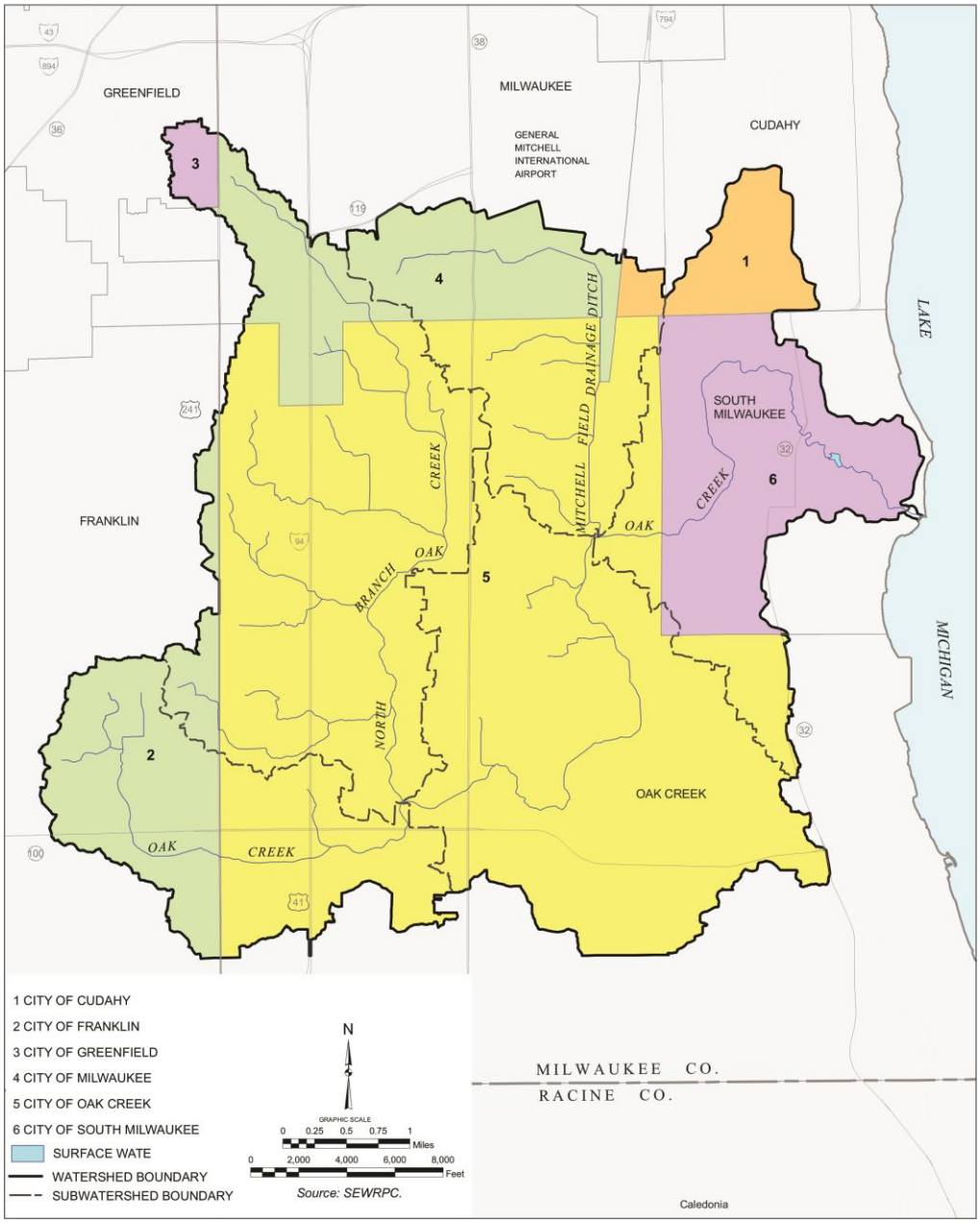
PROPOSED BUDGET FOR THE OAK CREEK WATERSHED RESTORATION PLAN

Task	Estimated Cost
1. Summarize the recommendations of the RWQMPU for the Oak Creek watershed	$ 30,000
2. Evaluate implementation of the recommendations of the RWQMPU for the Oak Creek watershed since 2007	17,000
3. Inventory recent and ongoing projects, programs, and initiatives and integrate these into the recommendations	17,000
4. Characterize the watershed concentrating on features related to the focus issues	166,000
5. Develop plan objectives	26,000
6. Develop alternative approaches to addressing the plan objectives and meeting the plan objectives	99,000
7. Synthesize a recommended plan	86,000
8. Identify high priority recommendations	26,000
9. Develop implementation strategy	23,000
10. Ongoing outreach	52,900
Total	$542,900

Source: SEWRPC.

Map 1

CIVIL DIVISIONS WITHIN THE OAK CREEK WATERSHED: 2000



Map 2

SURFACE WATER WITHIN THE OAK CREEK WATERSHED: 2000