

July 24, 2007

Mr. Kevin L. Shafer  
Executive Director  
Milwaukee Metropolitan Sewerage District  
260 West Seeboth Street  
Milwaukee, WI 53204-3049

RE: Intergovernmental Cooperation Agreement

Dear Kevin,

I am pleased to inform you by this letter of the completion of the required portions of the Village of Elm Grove's flood management project pursuant to our Intergovernmental Cooperation Agreement dated May of 2006.

As required per the agreement, enclosed is a stamped memorandum from the Village's design engineer stating compliance with the 4.6% flow reduction requirements of our agreement. As this condition has now been met we are requesting the payment of the \$1,000,000 which is due upon this certification and completion.

The Village of Elm Grove appreciates the cooperation and support of the MMSD regarding this important project. It is partnerships like this that help everyone meet the overall goals of water management in the region.

Sincerely,

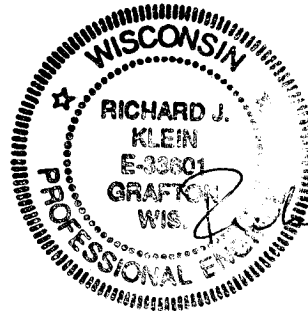
David De Angelis  
Village Manager

Enc.

Cc: Neil Palmer, Village President  
Mary Stredni, Village Clerk  
Rich Klein, Project Design Engineer

## Memorandum

Date: July 19, 2007  
To: David De Angelis (Elm Grove)  
From: Richard J. Klein, P.E.  
CC: David Fowler, CFM (MMSD)



Subject: **Project Compliance with Milwaukee Metropolitan Sewerage District Performance Requirements Stipulated in May 2006 Intergovernmental Cooperation Agreement**

This memorandum documents the Village of Elm Grove Underwood Creek Flood Management Project's compliance with the performance requirements stipulated in the May 2006 Intergovernmental Cooperation Agreement (ICA) between the Village of Elm Grove and the Milwaukee Metropolitan Sewerage District (MMSD). A copy of the ICA is included as Attachment 1.

### SUMMARY OF PERFORMANCE REQUIREMENTS

The ICA stipulates that the project is to produce a 4.6% reduction in flood flows (1% exceedance probability, 100-year recurrence interval) of the Underwood Creek at River Mile (RM) 2.5 and result in a reduced flood stage elevation. The project is to include two detention basins or equivalent storage equal to 58 acre-feet as described in Table 3 of the February 5, 2001 Southeastern Wisconsin Regional Planning Commission (SEWRPC) Staff Memorandum entitled "Alternative Refinements to the Recommended Floodland Management Plan for Underwood Creek". Compliance with the ICA is to be determined through the use of the United States Environmental Protection Agency HSPF continuous hydrology model and the Corps of Engineers HEC-RAS river analysis hydraulic model.

### DESCRIPTION OF PROJECT FLOOD STORAGE FACILITIES

The Elm Grove Underwood Creek Flood Management Project incorporates three excavated flood storage facilities that provide approximately 91 acre-feet of storage. These facilities are identified as follows:

- The Village Park Pond (60 acre-feet), located in the Village Park north of Juneau Boulevard;
- The Legion Post Facility (3 acre-feet), located at the former Legion Post site at the intersection of Juneau Boulevard and Legion Drive;
- The Southeast Facility (28 acre-feet), located at the former Sleepy Hollow Motel and Villager Apartments site north of West Bluemound Road and west of North 124<sup>th</sup> Street.

The Village Park Pond and Legion Post Facility were substantially complete in April 2007. The Southeast Facility was substantially complete in July 2007. Record drawing surveys of these



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## Underwood Creek Flood Management Project

Village of Elm Grove, Wisconsin

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facilities were completed in July 2007, confirming that the facilities were constructed according to the design represented by the numeric models.

### MODELING METHODS USED FOR ANALYSIS

Underwood Creek hydrology was analyzed using the United States Geological Survey's Hydrologic Simulation Program – Fortran (HSPF version 11.1+) and the U.S. Army Corps of Engineers Flood Frequency Analysis program (HEC-FFA version 3.1). HEC-RAS was used to develop storage-discharge rating tables for use in the HSPF model. Existing HSPF models developed by SEWRPC were obtained to represent the existing condition. The existing models were updated to create a modified existing model, reflecting a higher level of detail and providing more flow reporting points through the project area. All flows are based on an HSPF simulation of storm events from 1940 through 1997 as described in the February 5, 2001 SEWRPC Staff Memorandum. The modified existing model was then adjusted to create a proposed condition model that reflects new storage-discharge relationships resulting from the flood storage facilities. The HSPF model computes the flow rate in each reach for a historical series of storm events. The maximum annual flow at each reach is extracted from the HSPF output and used to develop a HEC-FFA input file. A flood frequency analysis is then performed using HEC-FFA and used to compute storm events with recurrence intervals from 1.01-year through 1000-year.

Underwood Creek hydraulics were analyzed using the Army Corps of Engineers HEC-RAS program (version 3.1.2). Two existing HEC-RAS models developed by SEWRPC were obtained and combined to represent the existing condition through the project area. That existing model was then updated with 2004 topographic survey data to create a modified existing model. The modified existing model was then adjusted to reflect the project design to create the proposed model.

### RESULTS

The following table summarizes the results of the analysis at RM 2.5 and demonstrates compliance with the requirements of the ICA.

**Table 1 - Summary of Results at RM 2.5**

	Pre- Project Condition	Post- Project Condition	Reduction
1% Flood Flow	3,540 cfs	3,320 cfs	6.2%
Flood Stage Elevation	716.69 ft	716.43 ft	0.26 ft



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## Attachment 1

### INTERGOVERNMENTAL COOPERATION AGREEMENT BETWEEN THE VILLAGE OF ELM GROVE AND THE MILWAUKEE METROPOLITAN SEWERAGE DISTRICT CONCERNING PLANNING, DESIGNING AND CONSTRUCTION OF A STORMWATER DETENTION FACILITIES ON UNDERWOOD CREEK

The Village of Elm Grove, a general purpose municipal corporation, organized and operating pursuant to Wis. Stat. ch. 61, hereafter "Village" and the Milwaukee Metropolitan Sewerage District, a municipal body corporate, organized and operating pursuant to Wis. Stat. §§ 200.21 through 200.65, hereafter "District," enter into this Intergovernmental Cooperation Agreement, pursuant to Wis. Stat. §66.0301, effective the latest date appearing below, to provide for the planning, design, and construction of a stormwater detention basin on Underwood Creek:

WHEREAS, Underwood Creek floods certain areas of the Village within Waukesha County and, upon its confluence with the Menomonee River, floods certain areas of the City of Milwaukee and the City of Wauwatosa within Milwaukee County; and

WHEREAS, the District has determined to take jurisdiction over portions of Underwood Creek tributary to the Menomonee River for the purpose of projecting, planning, designing, and constructing improvements to the drainage of Underwood Creek, so as to ameliorate or eliminate flood damage within the City of Milwaukee and the City of Wauwatosa; and

WHEREAS, the Village requested the assistance of the Southeastern Wisconsin Regional Planning Commission (SEWRPC) to analyze and recommend a floodland management plan for the Village, which resulted in SEWRPC Community Assistance Planning Report No. 236, entitled "A Stormwater and Floodland Management Plan for the Dousman Ditch and Underwood Creek Subwatersheds in the City of Brookfield and Village of Elm Grove," (February, 2000); and

WHEREAS, the Village requested further analyses of the subject of the report, which resulted in a SEWRPC Staff Memorandum, dated February 5, 2001, entitled "Alternative Refinements to the Recommended Floodland Management Plan for Underwood Creek;" and

WHEREAS, the Village and the District agree that the preferred alternative for addressing floodland management is Refined Alternative No. 3, as set forth in the text of and as described in Table 3 and Table 6 of the February 5, 2001 Staff Memorandum dated February 5, 2001; and

WHEREAS, Refined Alternative No. 3 provides for the Village to construct 58 acre-feet of excavated storage along Underwood Creek, which excavated storage is hereafter referred to as the "Underwood Creek Detention Basins;" and

WHEREAS, the Village and the District agree that the United States Environmental Protection Agency (EPA) HSPF (continuous hydrology) model and the Corps of Engineers HEC-RAS (River Analysis hydraulic model) were the models used to evaluate the project impact on flood flows as set forth in the text of and as described in Table 3 and Table 6 of the February 5, 2001 SEWRPC Staff Memorandum; and

WHEREAS, the Village and the District agree that the United States Environmental Protection Agency (EPA) HSPF (continuous hydrology model) and the Corps of Engineers HEC-RAS (River Analysis hydraulic model) will be used in the future to determine compliance with this agreement; and

WHEREAS, the District is willing to contribute One Million (\$1,000,000) Dollars toward the construction of the Underwood Creek Detention Basins by the Village;

NOW, THEREFORE, in light of the above and foregoing declarations, the Village and the District enter into this

Intergovernmental Cooperation Agreement, setting forth their respective roles in the planning, design and construction of the Underwood Creek Detention Basins:

1. **Respective Responsibilities Of The Village And The District For The Underwood Creek Detention Basins Project.** A) The Village. The Village will finance the construction of the Underwood Creek Detention Basins. In addition, the Village agrees to perform the design and construction of the Underwood Creek Detention Basins. The design and construction of the basins shall produce a 4.6% reduction in flood flows of the Underwood Creek at River Mile 2.5 and shall result in a reduced flood stage elevation.

B) The District. The District will pay the Village One Million (\$1,000,000) Dollars toward design and construction of the Underwood Creek Detention Basins on the Underwood Creek upon completion of the design and construction of two detention basins or equivalent storage along Underwood Creek equal to 58 acre feet as described in Table 3 of the February 5, 2001 SEWRPC Staff Memorandum.

C) For purposes of verifying whether the Village's construction has produced the herein purchased 4.6% reduction in flood flows on the Underwood Creek at River Mile 2.5, the parties agree that the models to be used are the EPA HSPF model and the Corps of Engineers HEC-RAS model.

2. **Maintenance Costs Of The Underwood Creek Detention Basins.** The maintenance of the Underwood Creek Detention Basins shall be the responsibility of the Village.

3. **Maintenance of Flood Stage Elevations.** The Village and the District agree and understand that the maintenance of the Underwood Creek Detention Basins will be conducted to produce and maintain a 4.6% reduction in flood flows of the Underwood Creek at River Mile 2.5 is of the essence of this Agreement and recognize that the District's participation herein would not occur without assurances that the flood flow shall have a 4.6% reduction in Underwood Creek at River Mile 2.5. The Village agrees to maintain and operate the Underwood Creek Detention Basins to maintain a 4.6% reduction in flood flows of the Underwood Creek at River Mile 2.5 as determined with the hydraulic and hydrologic computer simulation models described in this agreement and provided such maintenance is permitted by current or future applicable laws or

regulations. This shall not obligate the Village for changes in upstream conditions or rainfall levels or other levels of development in excess of those assumed in the models contained in section 1.c above.

WHEREFORE, the authorized representatives of the parties to this Intergovernmental Cooperation Agreement affix their signatures, being duly authorized to do so.

VILLAGE OF ELM GROVE

Executed this 23 day of May,  
2006, pursuant to approval granted  
on the 23 day of May, 2006,  
by the Board of Trustees of the  
Village of Elm Grove

By: [Signature] 5/23, 2006  
Village President (Date)

By: [Signature] 5/23, 2006  
Village Clerk (Date)

MILWAUKEE METROPOLITAN  
SEWERAGE DISTRICT

BY: [Signature]  
Kevin L. Shafer, P.E.  
Executive Director

Date: 5/31/06

Approved as to form:  
[Signature]  
District Division of Legal Services