

# **Impact of Volume Control and Watershed Specific Release Rates on Stream Erosion and Related Water Quality Effects such as Turbidity and Sedimentation**

## **WMO Article 208.4**

### **Goals of Article 208.4 Study**

Article 208.4 requests that the impacts of volume control and watershed specific release rates on stream erosion and related water quality effects such as turbidity and sedimentation be assessed. The goal of the study is to identify the effect of watershed management strategies such as volume control and watershed specific release rates on stream erosion, turbidity, and sedimentation.

### **Methodology and Scope of Work**

The District proposes to contract an agreement with the Illinois State Water Survey to complete the analysis of this study. Impacts of stream erosion will be investigated within a literature review on urban stream erosion and an information search to determine available detailed information on stream characteristics across Cook County. A thorough review of scientific literature on urban stream erosion and the relationship between the magnitude and frequency of flows from watersheds with different stormwater management practices will be conducted. Lessons learned from the literature review will be summarized and used to examine possible implications on the erosional stability of streams in Cook County. The potential for streams to erode is related to their material properties, so an additional search will be conducted to collect information on material properties of streams within Cook County. Hydrologic and hydraulic analysis methodology will also be developed within this study.

### **Pilot Study Option**

Based on the results of the literature review, a pilot watershed analysis related to stream erosion for two subwatersheds may be studied. The selection of the subwatersheds and inclusion of this analysis is dependent on the results of the information search, literature review, and review of hydrologic and hydraulic methodology. As part of this pilot study, two subwatersheds will be analyzed in detail to determine how the general impacts of volume control and watershed specific release rates translate to more specific erosion impacts on Cook County streams.

### **Reporting**

For the stream erosion impact assessment, the impact of variation of release rates on the frequency of occurrence of sediment flows at a range of magnitudes, along with the potential of these flows to affect geomorphic stability (stream power, shear stress) will be documented. A final report will be created regarding the assessment of impacts to stream erosion based on volume control and watershed specific release rates. This will include recommendations using the analysis of erosion potential of streams in Cook County as it relates to watershed release rates, based on the literature review, information search, and the results of the hydrological and hydraulic analysis conducted in this study.