

MEMORANDUM OF AGREEMENT
THE UNITED STATES SECTION OF THE INTERNATIONAL JOINT COMMISSION
AND THE DEPARTMENT OF THE ARMY (1998)
Amendment 15

ARTICLE II – SCOPE

Insert new paragraphs W. as follows:

W. The St. Paul District Corps of Engineers will develop steady and unsteady flow hydraulic models of the Rainy River downstream from the International dam at Fort Frances and International Falls to its mouth at Lake of the Woods. This work will be accomplished using a merger of river cross-section data developed from a high-resolution digital terrain model (DTM) and cross-section data developed from Acoustic Doppler sounding surveys accomplished under Amendment 11 of this MOA. The DTM will be developed from an airborne Lidar survey of the Rainy River from the International dam to the mouth. Once developed, the steady and unsteady flow hydraulic models will serve as immediately useful tools in future assessments of the impacts of hydropower peaking on the Rainy River. The models will also be useful for future assessments of the impacts of the new rule curves for Rainy and Namakan lakes on the downstream areas along the Rainy River and future assessments of other existing or future issues related to Rainy River levels, flows, water quality, fish and wildlife. Model outputs will be useful in developing in-stream flow habitat models for the river and providing an interface for a visualization tool to increase public understanding by displaying the effect that varying inputs have on model outputs for various scenarios of interest

The high-resolution digital terrain model (DTM) will be developed from LIDAR data over approximately 90 river miles of the Rainy River from the dam at Fort Frances and International Falls to the mouth at Lake of the Woods. The DTM will cover that area within 2000 feet of the centerline of the channel for a total top width of 4000 feet. A point spacing of 2 meters and vertical accuracy of 15 centimeters (RMSE) are required in addition to break lines for key ground features that are critical in developing an accurate DTM. The end product would be capable of producing 2 foot interval contour mapping. Contour maps will not be produced as a part of this work effort.

Cross-section data cut from the DTM using the computer program GEORAS will be merged with the Acoustic Doppler sounding cross-section data previously obtained under Amendment 11 of this MOA. The USACE Hydrologic Engineering Center's widely used computer program HECRAS will be used for development of the Rainy River hydraulic models. HECRAS has utilities for importing cross-section data from two different sources and merging the above water data with the sounding data into one composite cross-section. During this process the number of data points may also require filtering so that the number of points does not exceed the maximum allowable for HECRAS.

Prior to commencing the Lidar Survey work for the DTM and subsequent development of the HECRAS hydraulic models, the St. Paul District will coordinate the proposed work with the International Rainy Lake Board of Control, International Rainy River Water Pollution Board, Minnesota Department of Natural Resources, the Ontario Ministry of Natural

Resources and representatives of the affected First Nations in the Rainy River District through the Fort Frances Chiefs Secretariat. Two brief progress reports in electronic format will be provided to the U.S. Section by 26 January 2007 and 25 May 2007. The deliverables will be DTM data from the Lidar surveys, HECRAS steady and unsteady hydraulic flow models and a brief final report in an electronic format that will be delivered to the U.S. Section by 31 August 2007. The final report will include a summary describing methods and results.

ARTICLE V – FUNDING

In the first paragraph, last line, after section U: delete “and”, and
In the first paragraph, last line, after section V: delete the period and insert “; and \$264,000 for Article II, section W.”

ARTICLE VIII – RESPONSIBILITY FOR COSTS


In the first paragraph, line 4: delete “\$928,550.” and insert “\$1,192,550.”

This Amendment 15 shall be effective when signed by both the U.S. Section and the Department of the Army.

International Joint Commission
United States Section

Department of the Army


ELIZABETH C. BOURGET, P.E.
Secretary


DONALD R. KISICKI
Deputy Chief, Interagency and
International Services Community of
Practice
Directorate of Military Programs

DATE: 9/20/06

DATE: 9/21/06