



# United States Department of the Interior

BUREAU OF RECLAMATION  
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## MEMORANDUM

To: Chief, International Affairs  
Attn: 96-43100

Through: Maryanne C. Bach   
Director, Technical Resources

MAY 26 2006

From: Tony Wahl, Hydraulic Engineer  
Water Resources Research Laboratory 

MAY 24 2006

Subject: Trip Report - Montréal, Québec, Canada - Control No. 047

(1) Travel Period (dates): April 24-27, 2006.

(2) Places and/or offices visited: Offices of CEA Technologies, Inc. (CEATI), Montréal, Québec, Canada.

(3) Purpose of Trip: To participate in meetings of the CEATI, Dam Safety Interest Group (DSIG), and chair a meeting of the sponsors working group for the dam breach erosion research project

(4) Synopsis of trip: I traveled to Montréal, on Monday, April 24, 2006. On Tuesday, I chaired a meeting of the working group for the dam breach erosion research project. The primary objective of the project is to develop improved computational tools for modeling embankment dam breach processes. Partners in the work include the Bureau of Reclamation, USDA-Agricultural Research Service (ARS), Electricité de France, Hydro Québec, and the U.S. Army Corps of Engineers. Each of the technical partners in the work presented a status report on their specific tasks, and we discussed many issues related to the development of project plans and work strategies for the future of the project. Work on the first phase of the project is due to conclude June 30, 2006. This phase has been one of information gathering, with three tasks that lay the foundation for future model development:

1. Development of a database of well-documented dam failure case studies that can be used to validate newly developed models. (lead agency: Electricité de France)
2. Critical review and summary of available numerical models for simulating dam breach processes, to assist the group in identifying technologies worthy of further development.

(lead agency: Hydro Québec and Ecolé Polytechnique Montréal)

3. Critical review and summary of past and present laboratory testing related to dam erosion and breach processes, to summarize laboratory work that can support model development and identify needs for additional laboratory work. (lead agency: Bureau of Reclamation)

The strategy we developed for furthering the work is to next concentrate on validating promising modeling technologies using the case study database. The focus of the work at this time is expected to be on the Simplified Breach Analysis model under development now by ARS, and the Firebird model, developed at Ecolé Polytechnique Montréal. Initial work will focus on breaches of homogeneous cohesive earthen embankments, with erosion caused by overtopping flow. We discussed ways to begin considering zoned embankments and internal erosion processes as soon as possible in the project. We will be developing detailed project plans and seeking funding for specific aspects of the work during the summer of 2006, with an anticipated start in the fall of 2006. We hope to fund the majority of the work through in-kind contributions of the various partners in the work. A small percentage of the effort will probably be funded by other CEATI-member utilities that are not directly involved in the work.

On Wednesday and Thursday, I participated in the semi-annual DSIG meeting, which was attended by approximately 35 representatives of the United States, Canadian, and European electrical utilities. Interesting technical presentations were made on several topics, including the vulnerability of dams to explosives, rapid evaluation of seepage in dikes, reservoir debris management, geophysical investigation technologies, and dam safety data management systems. On Wednesday, I presented a status report on the dam breach erosion project and participated in round-table discussions of high-priority dam safety issues for each utility. On Wednesday evening, I sat in on a meeting of the working group for the project investigating new methods for testing the strength of dam anchors, a project partially sponsored by Reclamation. On Thursday morning, I presented an overview of ongoing research by Reclamation's hydraulic laboratory that is investigating problems created by high velocity flow across cracks and joints in concrete spillway chutes. I returned to Denver, on Thursday afternoon.

(5) Conclusions: The DSIG provides a useful forum for exchange of information with other dam owners. The DSIG is pursuing several research efforts that will be of value to Reclamation at their conclusion.

(6) Actions required: None.

cc: 84-44000 (Becker), 86-68560 (Pugh)