



**Report Title: Summer Rating Curves on the Lower Athabasca River,  
2004**

**Working Group: Surface Water Working Group (SWWG)**

**Final/Approved Report Date: January 14<sup>th</sup>, 2005**

**Contract Number: 2004-0001**

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## **CEMA Disclaimer**

**Contract Name: Bathymetric Surveys on the Lower Athabasca River, 2004**

**Consultant Name: Trillium Engineering and Hydrographics Inc.**

This report was commissioned by the Instream Flow Needs Task Group of the Surface Water Working Group of the Cumulative Environmental Management Association (CEMA), in its tasks of developing a defensible, science based IFN recommendation that provides full, long-term protection to the aquatic ecosystem of the lower Athabasca River. Specifically, this report was intended to describe summer rating curves for the lower Athabasca River in 2004.

This report has been completed in accordance with the terms of reference issued by the Instream Flow Needs Task Group. The Surface Water Working Group has closed this project and considers this report final.

The Surface Water Working Group or its Task Groups do not fully endorse all of the contents of this report, nor does the report necessarily represent the views or opinions of CEMA, the Surface Water Working Group or any of its Task Group Members.

The conclusions and recommendations contained within this report are those of the consultant, and have neither been accepted nor rejected by the Surface Water Working Group.

Until such time as the Surface Water Working Group issues correspondence confirming acceptance, rejection, or non-consensus regarding the conclusions and recommendations contained in this report, they should be regarded as information only.

For more information please contact CEMA at 780-799-3947.

January 14, 2005

Project Officer  
Wood Buffalo Region  
Cumulative Environmental Management Association  
Box 5656  
Fort McMurray, Alberta, T9H 3G6

Dear Sir/Madam

**RE: Summer Rating Curves on the Lower Athabasca River, 2004**

We have completed our summer rating curve measurements for the summer of 2004 as part of the Lower Athabasca River Fish Habitat Survey Program. These measurements were carried out at the upstream and downstream ends of each of the four study reaches established for the Program. The rating curves are required as boundary conditions for the flow simulations which will be carried out at these sites to evaluate fish habitat. The following report describes the data collection methodology and summarizes the results.

**Water Levels**

The data was collected at the upstream and downstream cross section locations of each of the four survey reaches. Water level recorders were installed at each location during the period of May 18-20, 2004. Water levels were recorded at one-half hour intervals until the recorders were removed again on Oct 4-5, 2004. Water levels were referenced to local benchmarks from the bathymetric surveys both at the time of installation and when the recorders were removed.

**Discharges**

The discharges at the time the water level measurements were determined from discharge measurements reported by Water Survey of Canada (WSC) for the Athabasca River below Fort McMurray (07DA001). Flows were adjusted for travel time and tributary inflows between this gauge and the survey reaches. Measured tributary discharges were prorated to the entire drainage area between Fort McMurray and the survey reaches. Data from four gauged tributaries were available: Steepbank Creek near Fort McMurray (07DA006); Mackay River at Fort Mackay (07DB001); Muskeg River at Fort Mackay (07DA008); and Firebag River at the mouth (07DC001).

The discharge during the water level measurement period ranged from 464 m<sup>3</sup>/s to 1960 m<sup>3</sup>/s at Northlands (Reach #5) and from 581 m<sup>3</sup>/s to 2030 m<sup>3</sup>/s at Embarras (Reach #2).

## Rating Curves

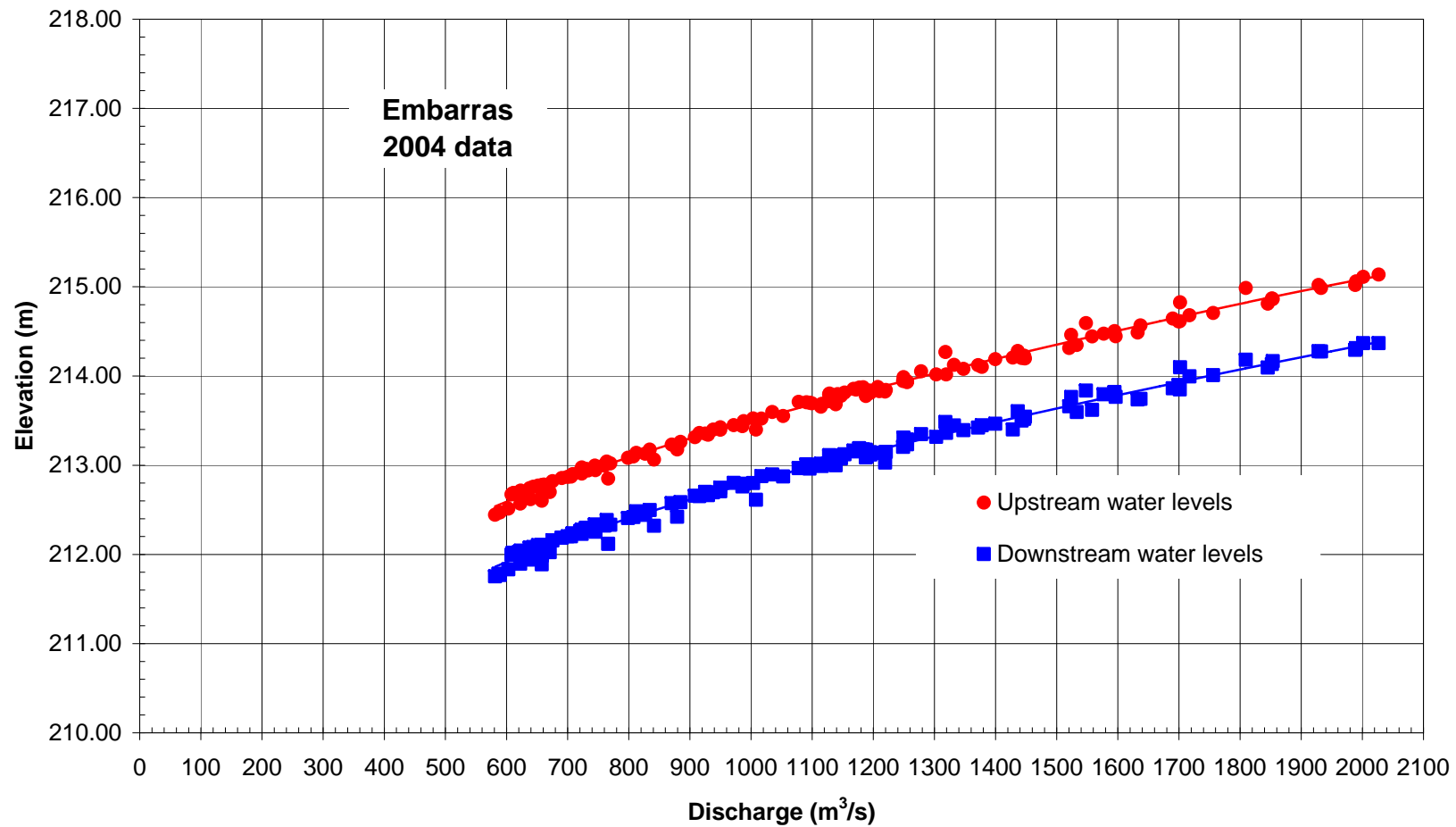
Preliminary rating curves of the daily average water levels and flows for the four reaches are presented in Figures 1-4. The rating curves will be finalized once the bathymetric survey data has been evaluated and one-dimensional hydraulic analysis has been carried out to provide a rational basis for extrapolation of the curves.

If you have any questions or comments about these preliminary rating curves, please call me at 780-496-7671.

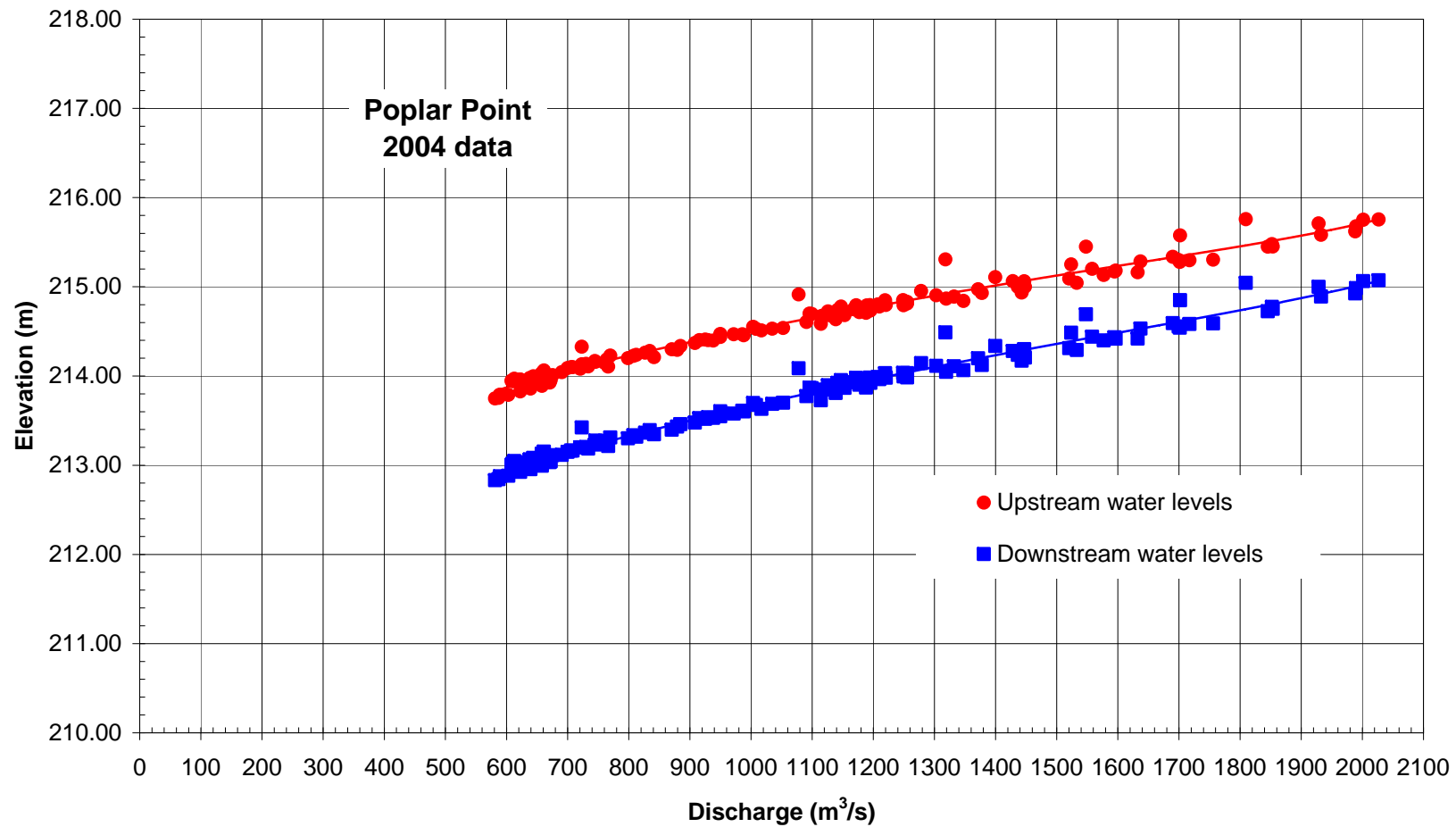
Sincerely,

A handwritten signature in black ink that reads "Gary Van Der Vinne". The signature is written in a cursive style with a large, prominent 'G' and 'V'.

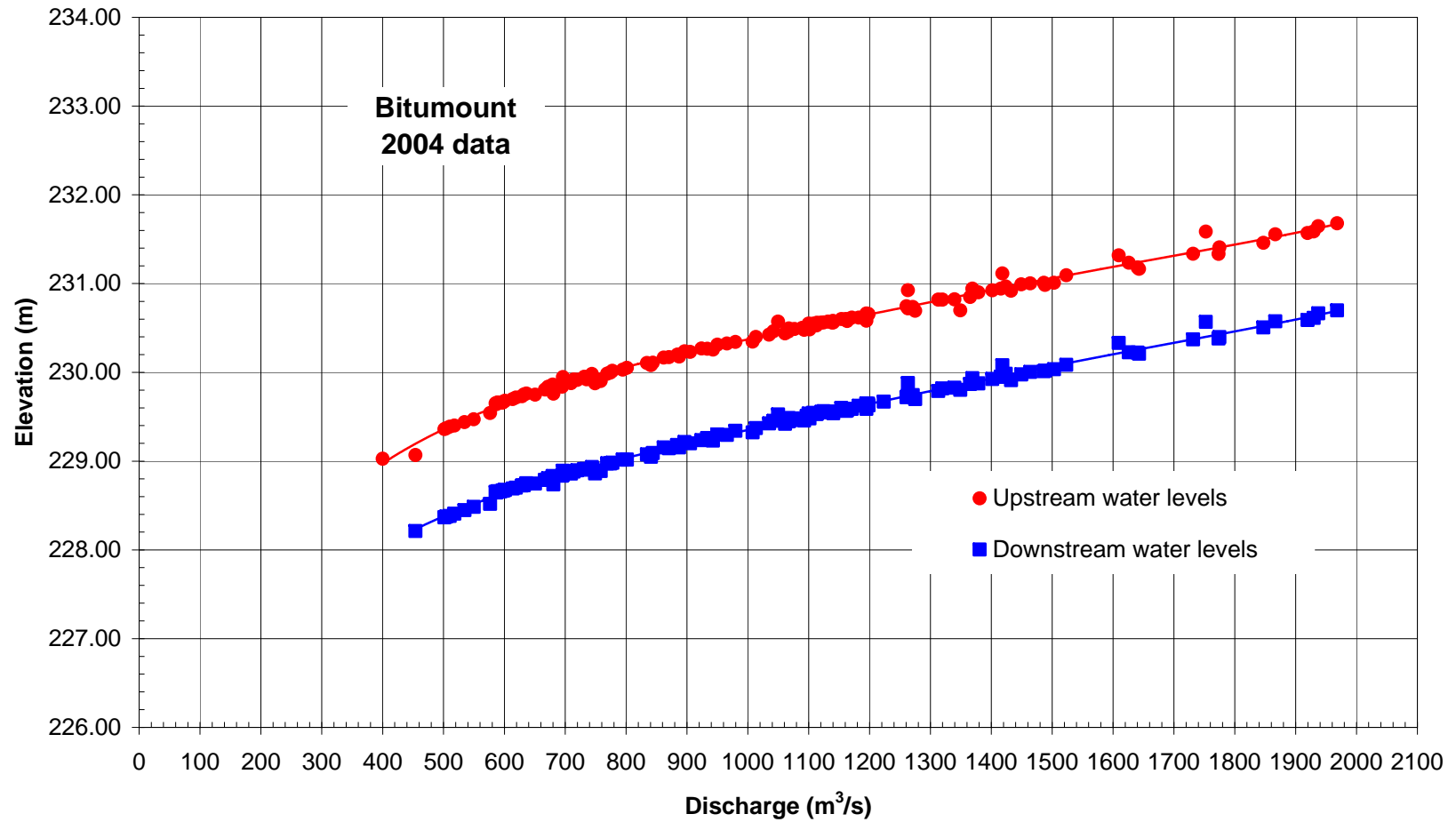
Gary Van Der Vinne, M.Sc., P. Eng.  
Trillium Engineering and Hydrographics Inc.



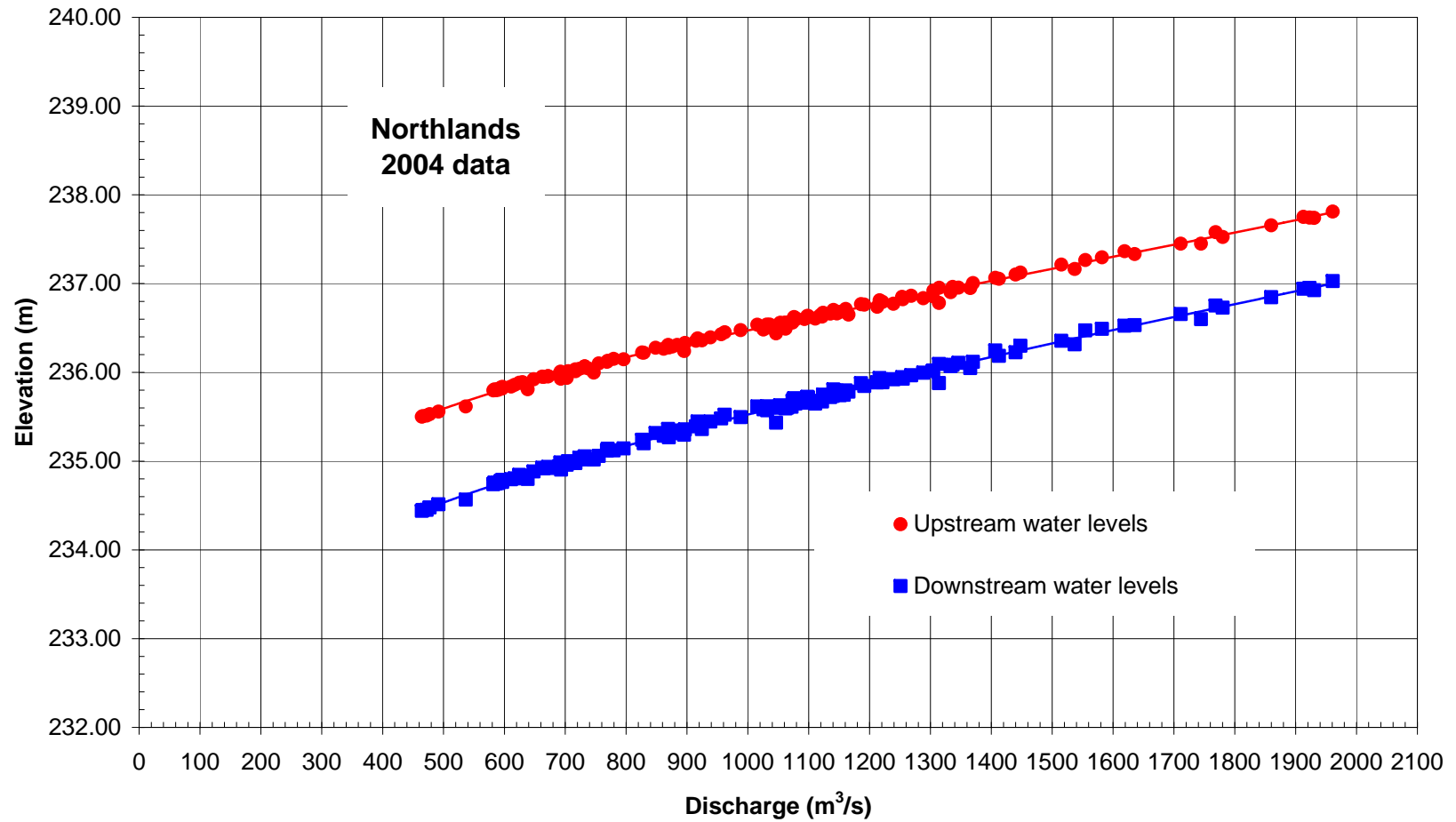
**Figure 1** Preliminary winter rating curves at Reach 2 (Embarras)



**Figure 2** Preliminary winter rating curves at Reach 3 (Poplar Point)



**Figure 3** Preliminary winter rating curves at Reach 4 (Bitumount)



**Figure 4** Preliminary winter rating curves at Reach 5 (Northlands)