

ON APPEAL FROM THE COURT OF APPEAL OF BELIZE

BETWEEN:

BACONGO

and

The Queen

and

The Department of the Environment

Belize Electric Company Limited

Appellant

1<sup>st</sup> Respondent

2<sup>nd</sup> Respondent

Affidavit of Dr. Chris Bowles

Dated 21<sup>st</sup> July 2003 on behalf of the Appellant

I, Dr. Chris Bowles of 928 2nd Street, Suite 300 Sacramento, CA, USA, MAKE OATH AND SAY as follows:

1. I am a hydraulic and hydrologic engineer with over 10 years of experience providing hydraulic and hydrologic analysis of fluvial, coastal and estuarine systems for projects ranging from watershed assessments to feasibility studies, design and research.. I have provided expert consultations on hydrologic and hydraulic systems for state and federal government agencies, as well as numerous private companies in the United States and the United Kingdom. I work for Philip Williams & Associates in California, USA, a private consultancy that has vast experience in hydrologic and hydraulic review consulting services for numerous hydroelectric dam projects around the World (including most recently Turkey, China, California and Canada) over the last 27years.
2. I was asked by the Belize Alliance of Conservation NGOs (BACONGO) in 2000 to evaluate the hydrological studies that had been conducted for the feasibility studies of the “Macal River Upstream Storage Facility” or Chalillo dam. As a result of this analysis, I provided BACONGO a report, Chalillo Hydropower Feasibility Assessment in February 2000, which was included in a set of comments that was sent to the National Environmental Appraisal Committee (NEAC) during its evaluation of the Environmental Impact Assessment (EIA) of the Chalillo dam project. These comments were exhibited to the May 2002 affidavit of Jamillah Vasquez, as JV6.

3. I have reviewed the hydrological reports produced by AGRA Power Inc in November 1999, which are included in the EIA for the Chalillo dam project, and it is my professional opinion that the hydrological data provided is highly deficient and by no means sufficient to make a sound decision concerning the construction of the project. While the analytical methodology employed to produce a statistical estimate regarding mean flows is sound, there are severe deficiencies in the period of record of the hydrological data, and the data which does exist is highly suspect due to data gaps and flawed flow gauging methods. This results in large uncertainties in the flow estimate. The uncertainties were not provided in the reports but were calculated by me based on the data available.
4. Because of the deficiencies in data, the estimates of electricity output, and the assumptions about flood elevations have a high level of uncertainty. A sound evaluation of the electricity generating potential of a dam would require a significantly longer period of record and estimates of the local flow at Chalillo based on rigorous flow measurements.
5. According to a news report on Belize's Channel 5 television news, Lynn Young, CEO of BECOL stated, in an interview following "groundbreaking" on the project, the company's intention to begin now monitoring of the inflows from water sources downstream from the proposed dam site. A copy of the transcript of this news report is shown to me and marked C.B.(1) for identification. Mr. Young is quoted as saying:

"But what we have to do over the next year or two is to study the river flows, because between here and Mollejon, there are other tributaries in the river and so you have to study these tributaries. If they are flooded, then you might not want to release as much water. If in dry season when those are very dry, we would have to release our water from here. So over time, we're gonna learn how to manage it to get the best performance at Mollejon and the least environmental impact."
6. The fact that the flow studies to which Mr. Young refers were not done before the project began conflicts with any standards of good practice for dam construction. The information on these inflows is critical to making a determination of the viability of the project, and in my considered

opinion, should have been gathered prior to a decision being made to go forward with the project.

7. It is my considered opinion that to build the Chalillo dam upon such current information poses both an economic and safety risk for the people of Belize and that to approve construction on the basis of that information does not meet my criterion for professional standard of care. It is surprising to me that a dam project of this type can be built with such deficiencies in hydrologic estimation.

Sworn to by the above-named )  
Chris Bowles at Sacramento, )  
California, USA )  
on the day of July )  
2003 ) \_\_\_\_\_

Before me,

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