151 Crosby Rd,
Hamilton Q4007

4 April 2007

The Secretary
Senate Rural and Regional Affairs and Transport
Parliament House
Canberra ACT 2600

RE: Inquiry into Additional Water Supplies for South East Queensland - Traveston Crossing Dam

Please find attached my "properly made submission" to the above Senate Inquiry.

I trust that this submission will be of keen interest to the Committee and I encourage the Senators to pursue any line of questioning that is borne from the facts raised, and options identified.

I can be contacted as follows:

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I would be pleased to answer any questions or explain further any aspect of this submission.

Also, I do acknowledge that the Deputy Premier of Queensland has previously committed to review all viable options to the Wyaralong dam, and has taken time to meet with myself and Dr Bradd Witt specifically to discuss the problems with the proposed dam and options for alternatives to it. Subsequently a report as to some options has been delivered by us to the Queensland Government for their consideration and we understand that there is to be further discussions held. However it is noted that the proposed project is proceeding through the approvals process and construction establishment phase regardless.

Yours faithfully

Andrew J Taylor

Submission to the Senate Rural and Regional Services and Transport Committee for inquiry:

"Inquiry into Additional Water Supplies for South East Queensland - Traveston Crossing Dam"

This submission **addresses the Inquiry terms of reference** stated as:

"the examination of **all reasonable options**, including increased dam capacity, **for additional water supplies for South East Queensland**, including:

(a) the merits of all options, including the Queensland Government's proposed Traveston Crossing Dam as well as raising the Borumba Dam: and

(b) the social, environmental, economic and engineering impacts of the various proposals"

1.0 Introduction & Background

In the weeks preceding the Premier of Queensland calling the 2006 State election, two major dam projects for south east Queensland were announced, Traveston Crossing and Wyaralong.

It could be said that the sheer size of the Traveston project and the large, well funded and supported objection to the project has focused all political and media attention in respect of dams toward Traveston, and subsequently little is known or appreciated, and far less is actually understood, in respect of the Wyaralong proposal.

Indeed, it has taken several months of research and questioning for myself to understand the actual "modus operandi" of the proposed Wyaralong dam and to evaluate the viability of the project. My research has and evaluation has revealed some remarkable facts, and simply put...

"the proposed Wyaralong dam is clearly and demonstrably not necessary, and could be easily replaced by low impact alternative options"

...and this submission will prove this assertion and provide an approach to **low cost and low impact alternative options**.

1.1 Evidence Base and Facts

The following basic facts are paraphrased from Queensland Government publications and statements:

- The stated "extra allocation" from the Logan/Albert River systems available for urban use is 42,000ML/year.
- The 104,000ML Wyaralong dam is to act in conjunction with the 1039ML Cedar Grove Weir will cost around $500M to deliver 21,000ML/year of the 42,000
- Wyaralong dam is intended to supplement (via release down Teviot Brook) the flow in the Logan River (at Cedar Grove) during periods of "insufficient flow" to maintain pumping rates into the "water grid" from the Cedar Grove weir.
- A new 8000ML "Off Stream Storage Facility" to be constructed at Bromelton is to deliver 5000ML/year (now under construction)

1.2 Modus Operandi of proposed Wyaralong dam

The operation of the "Wyaralong dam in conjunction with Cedar Grove Weir" (as per the Qld Government proposal) is described as:

- Water is pumped on a daily basis from the Cedar Grove Weir on the Logan River at a rate of 21,000ML/year (equating to 57ML/day) from its weir storage of 1039ML.

- During periods that natural Logan River flows are insufficient into the weir storage for the pumping of 57ML/day, release would be made from Wyaralong dam down the teviot (which flows to the Logan above the weir) to supplement the natural Logan River flow.

In simple terms, the proposed Wyaralong dam (at a cost of $500M) acts purely as a "top up" facility to the Cedar Grove weir.

Hence, the obvious and central question in respect of the requirement for (and the study of alternative options to) the Wyaralong dam is…

"How much water is required from Wyaralong dam to "top up" Cedar Grove weir?"

We refer to this quantum as "the Wyaralong contribution"and this question has been asked a number of times of the Qld Government and to date remains unanswered. This is absolutely critical to the evaluation of the feasibility of the Wyaralong dam component as part of the "Wyaralong dam in conjunction with Cedar Grove Weir" and the vast majority of cost and environmental and social impact is attributable to the dam component of the system.

1.3 The "Wyaralong Contribution"

All publicly available information suggests that the Cedar Grove weir provides 4000ML and hence infers that Wyaralong contributes 17000ML and this is **simply not true**. The fact that the true contribution will not be divulged could seem to be convenient way to perpetuate the "17000ML myth"

Whilst the actual quantum of the "Wyaralong contribution" has not been made public (despite a number of specific requests) it can be estimated using historical data.

A series of data is available and can be input into a model to ascertain the "Wyaralong contribution", in the absence of the provision of that information from Qld Government's own model.

I have created a model that interrogates daily flow information over the preceding twenty years of published DNRM records (published records to October 2003).

Daily flows (as a monthly average) taken at Yarrahappini (DNRM monitoring station below the Cedar Grove Weir) accurately quantifies the water available at Cedar Grove Weir. Note that the weir is below the convergence of the Teviot Brook (upon which the Wyaralong dam is proposed) and the Logan River and hence includes natural flows from the Teviot assuming the Wyaralong dam does not exist. However the Teviot is accurately describes as "ephemeral" and rarely flows (usually only after significant rain events) and it is anticipated that periods of low flow in the Logan would coincide with no flow in the Teviot and according not affect data should it be considered in conjunction with a dam or weir structure on the Teviot.

1.3.1 Model Inputs:

The model considers the following variables and variables:

1. Daily flows into the weir
2. Daily draw of 57ML/day from the Weir
3. Effective storage of 1039ML in the weir

By deducting the flow required to service the daily draw from the flow available any deficits can be identified and quantified. The 1039ML storage of the weir provides a small buffer against periods of flow that are less than required and the model assumes the use of the storage.

Importantly, this model assumes no "management of water" ie, "draw more when water is available and less when it is not". It would seem that this should be a key principle of the "water grid" concept to which Cedar Grove weir is connected. To this end, the model assumes the worst case.

It is noted that the model does not account for environmental flows, however the storage volume is so small that the weir is overflowing more that 75% of the time and hence providing environmental flows at these times.

1.3.2 Key Findings of the Model:

Figure 1 demonstrates that the Cedar Grove weir alone fully provides for required flows 85% of months. **Wyaralong dam would be unnecessary 85% of months studied and lie dormant (and wastefully evaporating) for 9 of the 17 years**.

Importantly, the maximum cumulated failed volume (being the accumulated deficit of draw required to satisfy 21,000ML/year) of any period of failure (the rare worst case being six months duration) is around 8000ML, but the median cumulated failed volume in any failed calendar year is around 3000ML

The worst failure calendar year required a **maximum contribution of 8,000ML.**

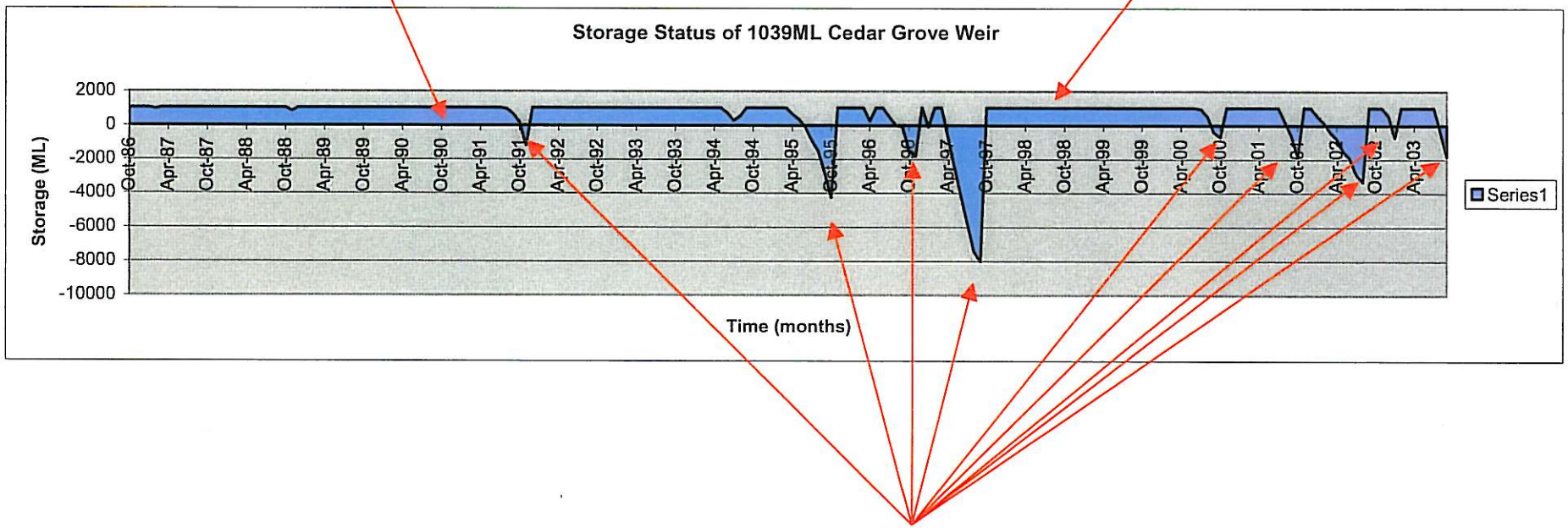
At this point it is relevant to recall that the proposed Wyaralong dam is to have a full storage of **104,000ML** which does not align with the requirements of it. The cost, and impact of this large dam is not in proportion of the requirements of it.

In summary of this section, the model has indicated:

- ***No "Wyaralong contribution" required for 85% of months***
- ***Contribution required 9 times in 17 years***
- ***The maximum required is 8000Ml/year***
- ***The median annual requirement when called on is 3000ML/year***
- ***The median annual requirement across all years is 1400ML/year***
- ***If the Wyaralong dam were built, the capital cost of water per ML/year would range from $62,500 (minimum) to $357,000 (average)***

Delivers 21,000Ml/year flows as "stand alone" for 85% of months

Full and Overflowing 76% of the time whilst delivering 21,000Ml/year flows as "stand alone"



nine short periods of failure to deliver 21,000ML/yr flow

FIGURE 1 – ***STORAGE STATUS OF CEDAR GROVE WEIR AT 1039ML MAX CAPACITY DELIVERING 21,000ML/year (Monthly base data)***

2.0 The Alternatives to Wyaralong dam

There exists are a number of low cost and low impact alternatives identified to supply the "Wyaralong Contribution" and ascertained above.

I refer specifically to the submission made to this enquiry authored by Dr G.B Witt, Katherine Witt and Andrew Taylor in which seven (7) viable alternatives are identified with a view to deliver up to 10,000ML/year to replace the Wyaralong contribution.

Again in is reiterated that the actual contribution has not been disclosed by the Qld Government, and that my model estimates this contribution to range from **zero to 8000ML** across the studied years.

Figure 2 below indemnifies that in by far the **great majority** (the 85th percentile) instances **"zero"** is the contribution:

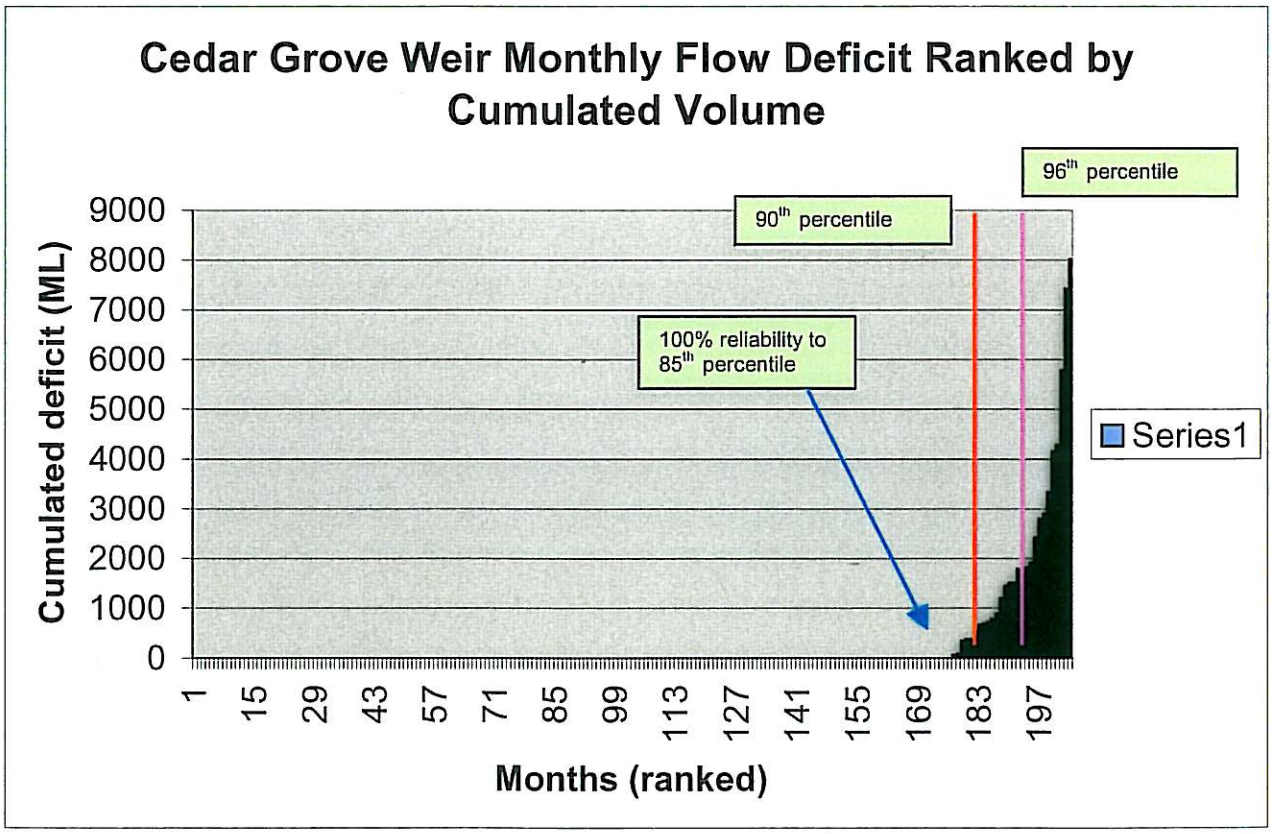


FIGURE 2 – ***Cedar Grove Weir Accumulated Storage Deficit ranked by Month***

Additionally, the below alternatives should be considered.

The options all incorporate infrastructure that is existing or currently under construction and hence cost and impact is small.

The Options are broadly described as:

1. **Increase storage capacity of Cedar Grove weir**
2. **Operate Cedar Grove weir in conjunction with Bromelton off stream storage**
3. **Use the "water grid" to manage water**

2.1 Increase storage capacity of Cedar Grove weir

The weir component of the system has been stated in Government documents as 1039ML effective storage. This is equal to around 18days pumping at daily rates to equal 21,000ML/year.

Even at this small volume, 85% reliability is achieved. By increasing the storage "buffer" to 4000ML the failure period is reduced from nine number to only 3, of which only one is of any consequence.

This equates to **97% reliability** in terms of months in which 21000ML/year is drawn

Figure 3 following graphically represents this.

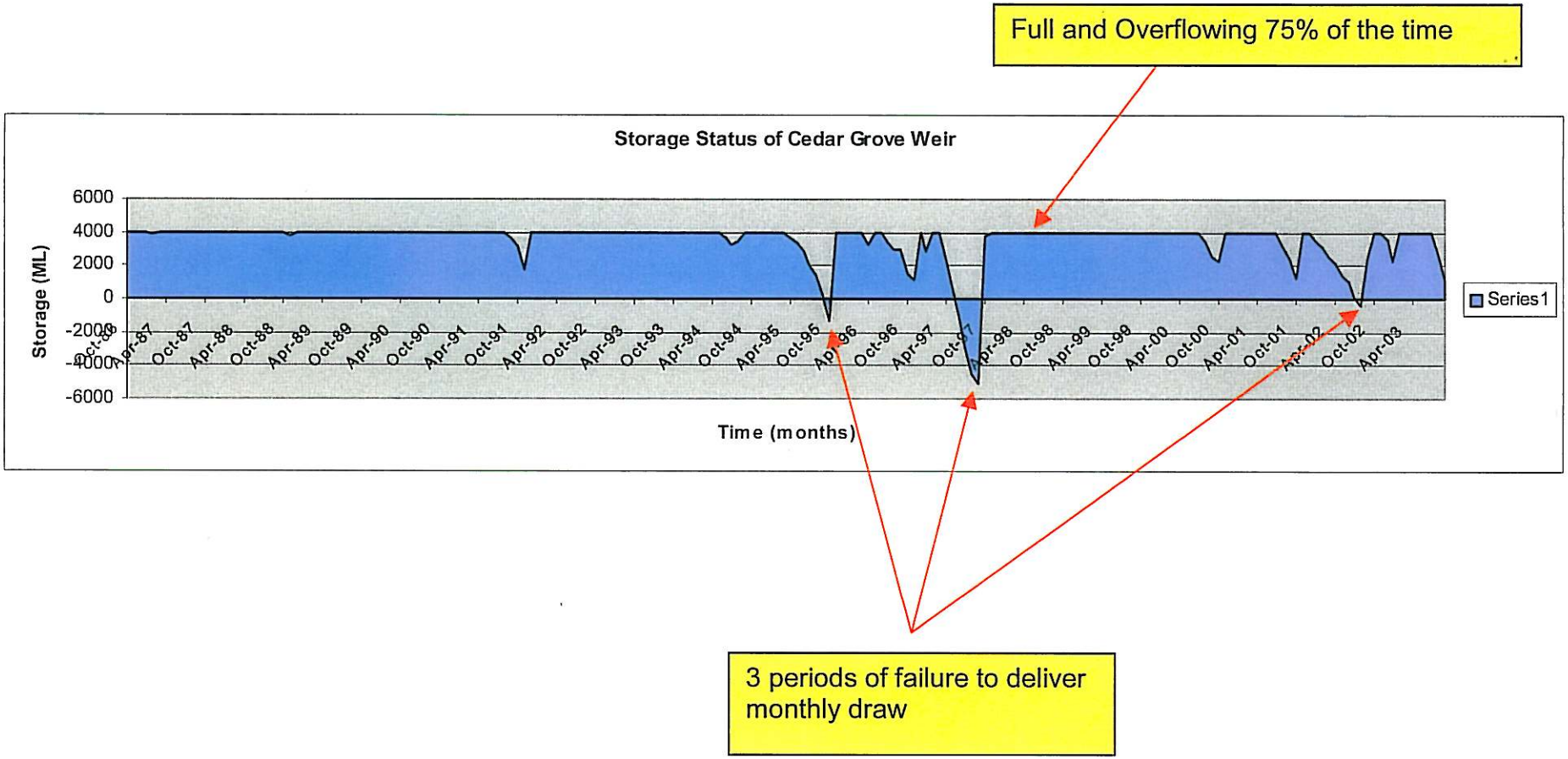


FIGURE 3 – ***STORAGE STATUS OF CEDAR GROVE WEIR AT 4000ML MAX CAPACITY DELIVERING 21,000ML/year (Monthly base data)***

2.2 Operate Cedar Grove Wier in conjunction with Bromelton off stream storage

The Bromelton Off Stream Storage facility is currently under construction and is designed to "harvest" water from the Logan River at times of "high flow". It is understood to have a full capacity of 8000ML and 5000ML/year is allocated to the "42000ML" from the Logan/Albert systems.

Flows into the facility have been modelled in conjunction with the Cedar Grove Weir (with the weir taking precedence in flow attribution) and found to have enormous spare capacity.

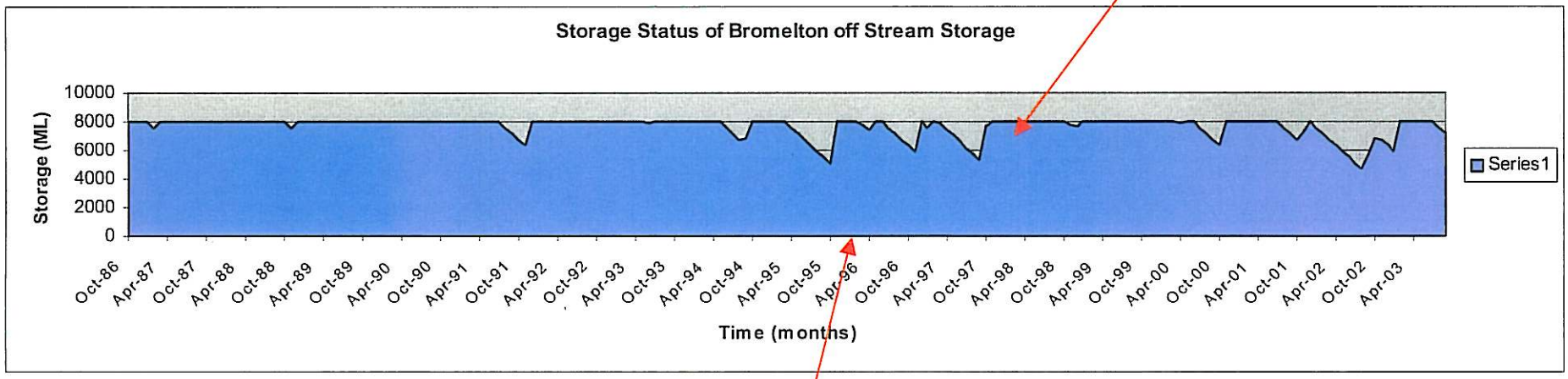
Figure 4 demonstrates that the facility would be full (at 8000ML) 71% of the time whilst delivering at 5000ML/year, and in the worst year would still contain more than 5000ML storage whilst still reliably drawing off water to achieve 5000ML/year.

As the facility is sited upstream of the weir, it seems simple to "reverse" the pumping to send water back to the Logan to supplement the weir (in the same fashion that Wyaralong dam is intended to operate).

Figure 5 demonstrates that in this fashion, the combined spare capacity of Bromelton and Cedar Grove weir provides **99% reliability** of the 21,000ML draw at Cedar Grove.

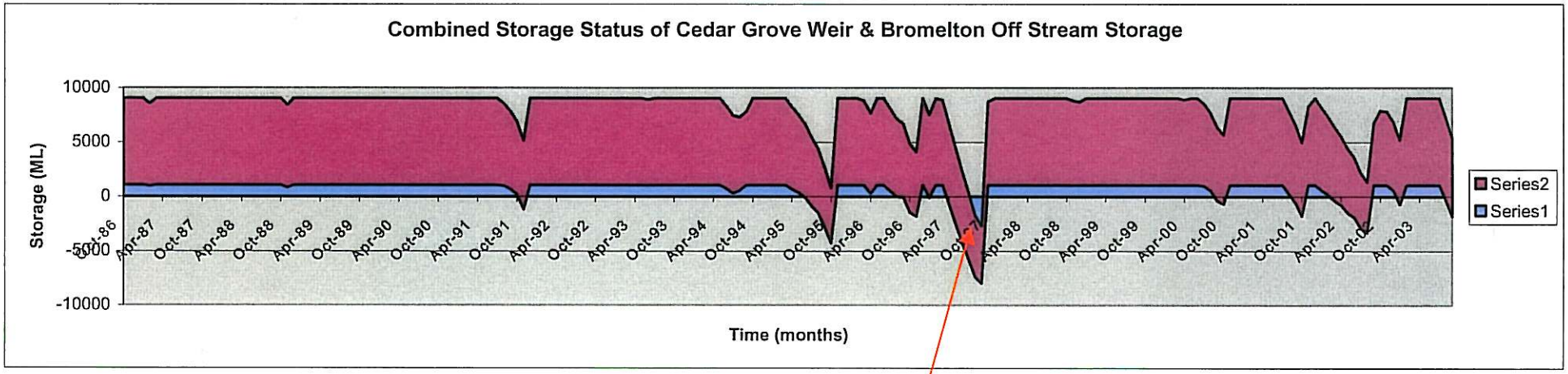
This option solely utilizes "existing" infrastructure in the form of Bromelton off stream storage with technically no impact.

Full 71% of the time whilst delivering 5,000ML/year flows as "stand alone"



Zero failure to deliver monthly draw but with significant spare capacity

FIGURE 4 – *STORAGE STATUS OF BROMELTON OFF STREAM STORAGE AT 8000ML MAX CAPACITY DELIVERING 5000ML/year (Monthly base data)*



Single failure only

FIGURE 5 – ***BROMELTON OFF STREAM STORAGE LINKED TO CEDAR GROVE WEIR DEMONSTRATING 99% RELIABILITY DELIVERING COMBINED 26,000ML/year***

2.3 Use the "water grid" to manage water

This option explores the need to actually supplement Cedar Grove weir at all.

It explores the "do nothing" approach to the 15% of the time where the weir cannot deliver flows at 21,000ML/year

Consider again **Figure 2.**

Eighty five percent (85%) of the time there is no need for a 104,000ML dam costing $500M at all.

Is 100% reliability worth the expenditure of $500M, the permanent destruction of the Teviot ecosystem and the social and cultural impact derived from the construction of a large, shallow, low yielding and unreliable dam that would lose 21000ML/year to evaporation?

Surely the concept of the water grid is to deal with precisely this 15% of the time? The concept of supply from a number of integrated sources from different geographic regions provides diversity of supply sources to move water around "as and when needed" or "as available" rather than wasteful storages in separate water region compartments.

By some basic "management of water" using the grid, the whole system can genuinely "do more with less"

By finding a mere 2500ML from elsewhere in the grid, the system could be considered **96% reliable.**

Find 8,000ML during the infrequent problem years and Wyaralong dam is totally redundant.

3.0 Conclusion

The following major conclusions can be drawn from this submission:

- **The actual contribution of the proposed Wyaralong dam to the system is very small and infrequently required**
- **The Wyaralong proposal has huge economic, ecological and social impact for very little output**
- **There are a number of low cost and low impact alternative options to Wyaralong proposal**

Furthermore, I offer the following observations and comments in respect of the proposed Wyaralong dam

It seems that the decision to build the Wyaralong dam has been made on not only outdated facts, but also outdated thinking. The decision to select wyaralong seems largely based on a desktop study that crudely assesses a range of large damsites identified hastily in 1990 (again in a politically charged environment).

The sizing of the proposed dam seems to have been assessed by *"how big it can be made before it gets ludicrous"* rather than *"how big it needs to be to sensibly contribute to the Wyaralong dam/Cedar Grove weir system".*

This is despite the fact that the concept of "storing water from rare major events until needed" is wasteful, expensive and destructive in the extreme in this instance.

There are clearly much more efficient and effective options to the dam that can be delivered at only a tiny fraction of the economic, social and environmental cost.

I have deliberately aimed to limit this report to convey only objective facts. The anguish that the Wyaralong dam proposal has caused to families in the affected area, of which I am a member, is so difficult to convey in words but I will say from a personal perspective that the factor that I find most frustrating, angering and disappointing is that this dam is simply...

not necessary, non-functional and horrendously wasteful and uneconomic.

Should we lose our land, and with it five generations of our family heritage spanning over 100 years, to this dam we can have no sense or comfort that a noble "sacrifice had to be made to secure water for fellow Queenslanders".

The proposal simply does not "stack up" and even worse, has viable alternative options that drastically reduce costs and impacts. I believe the situation we find ourselves in now is a result of the politicization of "the water issue" in Queensland and really has little to do with best approach to delivering water in a responsible and well planned fashion.