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Attention: Coordinator General
c/- EIS Project Manager, Urannah project
Office of the Coordinator-General
PO Box 15517
City East QLD 4002 Australia

Re: Submission to the draft Terms of Reference for an Environmental Impact Statement for the Urannah Project

Dear Sir or Madam,

North Queensland Conservation Council welcomes this opportunity to provide the following comments regarding the draft Environment Impact Terms of Reference (TOR) for the Urannah Project.

General comments

1.1 The early sections of the TOR focus on the dam and river. This could allow the proponent to ignore the 'secondary' or indirect impacts caused, for instance, by additional agricultural production which the dam aims to enable.

1.2 Similarly, while it may be embedded in some sections, it could be easy for the proponent to overlook upstream of dam effects in the inundation areas and downstream effects within the Lower Burdekin.

Thus, to ensure both these aspects (1.1 and 1.2) are not overlooked, they could be emphasised by adding to Part B "General approaches and requirements of the EIS", something to the effect of:

> *'all sections should be considered to apply to the dam, construction and operation, the river flow in the Broken/Bowen system itself and downstream in the Lower Burdekin and the GBR lagoon, and the inundation areas created by the dam, in terms of both direct effects on these areas, and any indirect impacts of activities arising from use of water the dam, including expanded areas of agriculture".*

1.3 The proponents are required to conduct public consultation and to report on this (#7.6 and Section #14). To ensure adequate inputs are gained from stakeholders (irrigators, coastal communities, various agencies, etc) a clear consultation process should be defined. Thus, something to the effect could be added Section 14#:

> *"to ensure effective consultation process, the proponents should within 90 days of the final ToR make public, a draft of their consultation plan (issues/stakeholders /provisional schedule), and subsequently consult with the stakeholders for dates of consultation so that the key stakeholders will be available, and publish the agreed program 10 days in advance. These consultations should be scheduled in the first quarter of the EIS so that they are not an afterthought to the EIS, but make a contribution to achieving an effective EIS".*

1.4 Many earlier documents from dam proponents have assessed water availability in terms of 'mean flows. This would tend to hide those years of low flows when users would struggle to obtain the water they expect. Median flows will better give an indication of consistent water availability across years.
Thus, to ensure this more suitable parameter is used, this could be emphasised by adding to Part B "General approaches and requirements of the EIS", something to the effect of:

> *'The proponents should in general use the parameter of 'median flows' in assessing water flows, unless they are attempting to make a specific point, and then they should note and justify the use of a different parameter".*

Specific areas of concern.
There are a range of concerns of the effects of dams on the Burdekin, some already becoming evident. These are stated here along with section of the ToR that could be strengthen to ensure the proponent is aware of these and thus responds to the sections adequately.

1.0 Persistent Turbidity;
Since construction of BFD, the river below the dam has run turbid for the full 12 months of the year. This turbidity affects all aquatic life: abundance of feed, access of fish to feed; spawning etc. Various assessments suggest that 40%+ of the overall sediment load of the Burdekin is provided by the Broken / Bowen catchment[1]. The construction of Urannah has the potential to turn the exceptionally dry-season clear waters of the Broken/Bowen to the Burdekin turbid, a length of approximately 120 km.

This is covered in general terms in Section 15.22 – 15.36 (water quality) and Section 15.164 (effects on aquatic biota)

The water discharged onto the GBR has further impacts. Recent research suggests that the levels of turbidity and sediment transported onto GBR may be related to outbreaks of COTS and low coral recruitment. *Section 16.17 (effect on RAMSAR Bowling Green Bay, and GBR)*

> *While the These sections should flag that turbidity is a key area of concern, and that they must respond to this specifically and substantially.*

2.0 Increased extraction of water from Urannah (150 - 175,000 ML) would have major impacts on aquatic life cycles in the river system
The Preliminary Business Case (2019) indicate the dam will yield 150,000 ML/yr. from a river system which has mean flows of 389,000 ML. This is an extremely high extraction rate of nearly 40% which would dramatically alter the hydrology of the river and its aquatic life. The use of mean flows' hides the fact that in 50% of years the flows will be below 200,000 ML per year and the 'median flows' are estimated as 233,000 ML per year[2]. The proposed extraction would dramatically affect the Bowen catchment hydrology significantly also, which overall has a mean flow of just 900,000 – 1,000,000 ML per year.

> *Overall flag the impact of high extraction rates on the hydrology and aquatic life of Broken/Bowen river system. This will be covered variously in Sections 15.3 – 15.23.*

[1] Youtube: NQCC Burdekin Seminar 4/13 – Sediment Budgets, Dr Stephen Lewis
[2] "An initial environmental assessment of water infrastructure options in the Burdekin Catchment", Burrows D., (1999)

Strengthen 15.16 by requiring - an explanation as to how water can be supplied to uses for agriculture in years of low flows (estimated to be 50% of years).

3.0 Water extraction by Urannah will affect sediment transport and risk of flooding in the Lower Burdekin. (NOTE; These effects will be compounded if raising of BFD (extraction 150,000 ML+ and Hells Gates Dam - extraction ~ 500,000 ML).

Construction of Urannah dam will reduce the volume of water flow in the Lower Burdekin with the effect of:

(a) further affecting the aquatic life that remains in the Lower Burdekin.
(b) increase deposition of sand in the Burdekin river-bed below BFD. (Current evidence suggests the bed level has risen 1-2 m since the dam constructed[3]). This will reduce the capacity of the river to discharge water quickly in extreme rain events, and so affect risk of catastrophic flooding, with impacts on communities of Ayr and Home Hill, and crop production in the Lower Burdekin irrigation areas.
(c) reduce 'flushing events' through the Lower Burdekin and transport of base-load sediment to Cape Bowling Green, potentially accelerating erosion of the Cape (see 4.0 below), with consequent degradation of Bowling Green Bay

These should be covered variously in Sections 15.3 – 15.23. It could be strengthened:

15.15 (h)
(i) changes to sediment transport potential erosion/scouring and changes in deposition upstream and downstream, including in particular deposition in the Burdekin river bed and effects on erosion of Cape Bowling Green and Bowling Green Bay
(ii) assess the impact such changes would have on any and all consequential impacts, including risks of flooding in the Lower Burdekin its communities and crop production; stability and diversity of Bowling Green Bay and its communities of Cungalla and Jerona; fishing both commercial and recreational in Bowling Green Bay and Upstart Bay.
15.15 (i) Add to existing …. "including in particular river bed levels".
These sections should flag the potential changes in river bed morphology and transport of base load sediment to Cape Bowling Green are key areas of concern, and that they must respond to these specifically and substantially.

4.0 Capture of coarse, or base-load, sediment by the dam resulting erosion of Cape Bowling Green and potential damage to the RAMSAR area of Bowling Green Bay.

The Urannah dam can be expected to capture an estimated 95-98% of coarse or base-load sediment from the granite soils of its catchment. There is strong evidence that since construction of Burdekin Falls Dam (1988), erosion of approximately 30m (measured by receding tree-line) has occurred along the length of Cape Bowling Green, with at least one point likely to breach (about 5 km back for the tip)[4]. Such a breach would accelerate erosion of the Cape, and expose Bowling Green Bay to drastic change.

Strengthening of 15.5 (h) as above, should be made along with flagging the high level of concern regarding the stability of Cape Bowling Green and Bowling Green Bay and the need for the potential impacts here to be assessed specifically and substantially.

[3] Prof Eric Wolanski, Youtube: NQCC Burdekin Seminar 08/13 and paper in preparation
[4] As above

5.0 Provision of water from Urannah for new areas of irrigated agriculture will affect sediment loads in the Broken/Bowen and Lower Burdekin water ways.

The project aims to enable 11,000 ha of new irrigated agriculture on what are highly erodible granitic soils. These can be expected to have a major impact on water quality and sediment loads both in the Broken/Bowen and the Lower Burdekin river systems.

> *Sections 15.3 - 15.23 should address this issue along with the strengthening of 15.5 (h) as above. At the same time, should be made along with flagging the high level of concern regarding the stability of Cape Bowling Green and Bowling Green Bay and the need for the potential impacts here to be assessed specifically and substantially.*

5.0 Assessment of dam safety

There have been a series of serious events linked to dam management and construction in Queensland in recent years; Wivenhoe; Paradise and Ross River). The existing BFD is under-designed and there is a Dam Improvement Project (DIP) being proposed at a cost of about $200M. Climate change will see extreme rain events becoming more common and even the norm. Thus, it is essential that the proponent, or proposed operator, will have the expertise and financial capacity to conduct effective management and maintenance over the life of the dam.

> *The notes heading the section on Health and Hazards should include an additional point (d) that refers to safety to downstream communities, commercial activities such as agriculture, and the environment from dam failure (management or mechanical)*
> *Section 15.152 should be expanded:*
> *(a) Existing section – directed at management of the dam.*
> *(b) An additional section to refer to means of assessment of dam design, and the program and financial resources that will be assigned to dam maintenance over the life of the dam.*
>
> *It might be preferable that this component of the EIS is carried out by an independent entity, contracted through DNR.*

6.0 Inundation

The Urannah dam will result in an inundation area to within a few km of Eungella National Park along Urannah river and Massey creek. These are still in very good condition and contain significant vegetation including *Eucalyptus raveretiana* listed as Rare on the Queensland Nature Conservation Regulation[5].

The importance of this is recognised in Section 11.5 and 11.6. They are recognised in the notes ahead of Section 16, (16 (a)). As well as the general alert proposed for Part B "General approaches and requirements of the EIS", these sections could be strengthened:

Section 11.5:
"Map the location and boundaries of the project footprint, including the inundation areas .....

Section 11.6
..... National Parks, matter of national and state significance (with particular reference to notes to Section 16 (a)), the location of ……

7.0 Assessment of project rationale and economics

[5] "An initial environmental assessment of water infrastructure options in the Burdekin Catchment, Burrows D., (1999)

The rationale and economics of the need for additional water yield are doubtful to say the least. A recent study found the project would return only 26c in the dollar. This looks at the over benefit of the project. It is also necessary to assess whether farmers could conduct cultivation at a profit, and based on water costs and similar studies for Hells gates Dam, this would seme unlikely except for a few niche products.
The rationale of the project is covered in Section 12: "Project rationale and alternatives", with more detailed economic analysis in Sections 15.111 to 15.116.

Strengthen
Section 15.113 (a) By adding
(vii) Assess the CBA on a' per ha' and on a 'per farm' basis for the production of possible crops, takin into account a range of water prices, market demand (domestic and export), access to market from the area taking into account transport damage and losses. The CBA must take into account potential crop losses from pest and disease, extreme weather (cyclone, floods, drought) and other external events that can affect both production and market demand which are the realities of farming in Far North Queensland
(viii) estimate the investment costs for establishing new irrigated agriculture in the proposed precinct and the comparative advantage to farmers (family and cooperate) to invest, and thus the likely uptake of land to come into production within 10 years of dam construction.
(ix) assess real demand from coal industry vis a vis their access to alternative sources, and comparative costs of such. This should also take into account the changing demand for coal in the light of global changes in demand.

8.0 Climate Change

This section (11.10 and 11.11) is quite minimal and requires the proponent to articulate the climate changes but not the effects that these may have on the operation of the dam and viability of proposed activities for the water users. This should be strengthened by specific reference to:
Section 11.10 Describe the changes in weather patterns:

- *(a) Changes in magnitude (intensity) and seasonal variability of rain fall, and flow-on effects such change would have on sediment generation and transport and consequent user activities in particular agriculture*
- *(b) Air temperatures, wind and humidity, and in particular transpo-evaporation and its effect on water storage availability, and on agricultural production (i.e., plant growth) and water use required. In respect to these, they must be related back to the rationale and economic viability in sections 12 and 15.111-15.116*
- *(c) Any other special factors such as temperature inversion that may affect management of the project*