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Mr Greg Watkinson
Acting Director Projects - References and Research
Economic Regulation Authority
197 St Georges Terrace
Perth WA 6000

Dear Greg

Re: Inquiry into the Cost of Supplying Bulk Potable Water to Kalgoorlie-Boulder – Public Submission of Regional Impacts paper

We attach the above-captioned paper on Regional Impacts of the Goldfields Water Supply Project.

This paper has been prepared for UUA by ACIL Tasman. It provides some analysis of, and insights into, regional implications of the UUA proposal as an alternative to progressive expansion of the G&AWS.

The paper considers the value of regional growth within the framework adopted by ERA.

The key conclusions of this paper are:

- The UUA project will benefit Esperance and the Goldfields over the next decade - this cannot be achieved by slow expansion of the G&AWS over several decades
- The UUA project will open up new mining activities, with associated production and employment as well as a contribution to economic surplus
- The UUA project will draw capital and labour into the Goldfields and Esperance regions
- The UUA project will open up a new independent water source that will increase the security of water supply to Kalgoorlie-Boulder
- The UUA project will result in a direct increase in royalties
- The UUA project will result in numerous indirect benefits, such as tariff reduction to Western Power, new support industry in Esperance, reticulated gas to small communities and removal of bore field at Esperance,

United Utilities

As discussed on 26th July 2005, some of these impacts have only been brought to our attention in the past month. We trust that the ERA will accept quantification of some of these impacts over the next two weeks now that they have been raised in this paper.

Yours sincerely,

Phil Endley
Project Manager - Goldfields Water Supply Project
United Utilities Australia

Goldfields Water Supply Project - Regional Impacts

Summary:

The Key Conclusions of this paper are:

- There are important differences between the way that the UUA project would impact on Esperance and the Goldfields over the next decade relative to progressive expansion of the G&AWS over a period of decades
- The UUA project will open up new mining activities, with associated production and employment as well as contribution to economic surplus
- The UUA project will draw capital and labour into the Esperance and Goldfields regions during both the construction and ongoing operations phase, in excess of $670 million of project spend
- The UUA project will open up a new independent water source that will increase the security of water supply
- The UUA project will result in a direct increase in royalties in excess of $75 million, which was not included in ERA's draft report.
- The UUA project will result in numerous indirect benefits, such as tariff reduction to Western Power, new support industry in Esperance, reticulated gas to small communities and removal of bore field at Esperance.

Background

We have read the just released ERA paper prepared by Marsden Jacob Associates, discussing economic impact assessment and cost-benefit analysis. We have no major difficulties with the paper, apart from those already expressed – most notably the deterministic approach taken to a far from deterministic decision. The principles are conventional economic analysis principles. We share the concerns expressed regarding the potential risks in heavy reliance on multiplier effects.

We also share the view that a detailed and complex impact assessment is often not necessary – and incline to the view that this is the case here. There are stark differences between the way that the UUA project would impact on Esperance and the Goldfields over the next decade relative to progressive expansion of the G&AWS over (probably) a period of decades. These differences flow from the different scales of the projects given sunk costs in the G&AWS, from the extent to which the UUA project is designed to meet a large bloc of industrial demands that would not be serviced by the G&AWS upgrade (and that would, in some cases, not be met at all without the project), from water quality differences for Esperance and from the needs of the UUA project to locate and operate over many years a major water processing facility in Esperance.

TOR 5 for the current inquiry specifically asked that the Inquiry report on "... the potential to enhance regional economic development in Kalgoorlie-Boulder and the State generally."

The draft report treads lightly in this area. As you know, we have been careful all along to keep separate the consideration of costs and benefits as they feed into a sound cost-benefit analysis, and wider social impacts. The distinction is also made clear in the WA Department of Treasury and Finance Guidelines for Project Evaluation. There, social impact analysis is separated from economic analysis, and is recognised as including a range of considerations including State Development Goals and incidence (distribution of costs and benefits).

At the same time, there are areas of overlap – quality of life, health and safety, and environmental impacts are commonly introduced into economic analyses, usually via measures of societal 'willingness to pay'. Many of the social impacts of the UUA project in the Goldfields would flow from the introduction of an unsubsidized source of supply to the region at dramatically lower incremental cost than that now offered by expansion of the G&AWS. The economic benefits would translate into increased regional activity with associated social impacts.

The flipside of this is that one needs to be careful not to start justifying every project cost as a social benefit. The lynchpin in the case for the UUA proposal still rests with a favourable cost-benefit assessment. Regional and social impacts are secondary to this; the value of the project lies primarily in the way that it offers cost effective water to a substantially larger market than can be serviced by the G&AWS and by the opportunities it offers to reduce the costs to the region and the State of existing regulation and largely uncontested supply arrangements. The most important regional and social impacts flow from these opportunities.

We do not see much point in UUA trying to supply a thorough impact assessment to ERA. Based on our recent briefing notes, we believe that the cost-benefit analysis strongly favours the UUA proposal while the regional impacts, without detailed modelling, fairly unambiguously also operate in favour of the proposal.

There is undoubtedly scope for some disagreement as to the magnitude of these effects. We are of the view that the draft report understates their significance. A key reason for this lies in an assumption made in the economic assessment – that the UUA water going to non-Water Corporation customers will be used almost entirely to substitute for groundwater, and we have already set out reasons why this appears not to be the case. The economic case is, in our opinion, appropriately the focus of the UUA submission. The regional assessment is better viewed as 'cream' which, in the main, deals with policy drivers different from those behind the economic assessment.

To the extent that regional impacts are to have weight in the final decision, it seems appropriate that ERA and others have access to UUA's understanding of likely impacts and we have sought to document these here.

Main conclusions of regional importance

We have focused on three classes of impact that seem particularly relevant to development in the Goldfields. Both have significant economic linkages, and net benefit implications have already been covered in our assessment of the cost benefit:

- The implications of the UUA project for opening up new mining activities, with associated production and employment as well as contribution to economic surplus.
  - For reasons set out in our main briefing on the draft ERA report, we consider that the economic aspects of this expansion have been undervalued in that report.
  - Here we provide further information on possible implications for activity levels in the Goldfields region. I stress that these are not to be interpreted as benefit estimates comparable to the benefits in the economic analysis. They do, however, have important implications for the region.
- The implications of the project itself – build and operation – for the region.
  - These of course need to be compared to the implications of the G&AWS upgrades not proceeding
- The implications of a new supply that will increase water security to the region (assuming retention of the G&AWS asset).

We have not attempted to explore in any detail the so-called multiplier effects discussed in the ERA document released last week – and none of the numbers we present below incorporate multiplier effects. This type of analysis is prone to being seriously misleading. We have focused on *direct impacts* and discussed ways in which resource competition might limit the impacts. Having said that, we would be surprised if it was not in the nature of these multipliers that they would compound the benefits to the Kalgoorlie and Esperance regions more strongly than the costs. At a state and national level we would expect the differential to be smaller. Were the UUA project to be effective in relaxing the pressure that meeting Goldfields water supply through the G&AWS would bring on the state credit rating, then it would still be surprising if it did not deliver a WA benefit multiplier somewhat greater than the cost multiplier.

These judgments reflect no more than the principles set out in the ERA paper interpreted in the context of the two strategies. Primarily, we would expect the project to draw capital and labour into the Esperance and Goldfields regions during the project build, and we would see retention of capital and labour during both project operation and in support of the expansion in mining activity.

Extra mining activity

The pattern of demand for UUA supplied water remains uncertain. However, the pattern of new industrial and mining demand mapped out by UUA has been used by ERA, in a

deterministic manner, to underpin its primary analysis. Both ACIL Tasman and UUA have argued that an options framework is better suited, but for now we follow through on some regional implications that arise even within the deterministic perspective.

ERA has worked with the data produced from the UUA market research, classified as time series of demand in Kalgoorlie, Kambalda, Norseman and Esperance. We interpret the Kambalda/Norseman data as reflecting mining use.

The UUA market research provides a further breakdown of these data into the following categories:

- replacement of existing GAWS supplies;
- replacement of other sources including groundwater;
- water for increased mining output, broken into gold and nickel; and
- water for increased output from other industry sectors.

An additional category, classified by UUA as 'speculative', which included all laterite developments and farm use along with some other expressions of interest, was excluded from the data provided to ERA, used by UUA in its project modelling and used in the following analysis. We also have not included in the analysis the water for other industry, mainly because the benefits that would flow from it would be difficult to quantify. In any event, this was a relatively small component of the estimated future demand.

Working only with the component of the demand series designated 'water for increased mining output', we have developed estimates of the consequential value of the increased production. For reasons discussed in our main briefing paper, some of this increase is likely to involve expansion of activity levels in existing mines, in response to the lowering of production costs. However, we also understand that a significant component of the expansion, as indicated by the market research, will lie with new mining activities, enabled by the introduction of access to quality water at a moderate incremental cost.

To provide production estimates, we developed a synthetic model of water to ore to metal conversion.

For gold, we based the parameters in this simple conversion model on input provided in discussions with Kevin Morgan of Morgan and Associates and Vince Roberts of Roberts and Associates, both consulting geologists and each with more than 40 years experience in the gold industry. Based in these conversations, we worked through the material as follows:

- Gold mines today are marginal at a yield of 1.5 grams to the tonne of ore. The working range is 1.5 to 3 grams/tonne. Four grams would be a highly profitable mine.
  - We selected a working number of 2.0 grams of gold yield per tonne of ore; this may well be a little conservative.

- The tonnes of water used to treat a tonne of ore depends on whether it is hard rock or surface. The more clay in the ore, the more water that is required.
  - For surface ore, a processing operation would use 1.5 tonnes of water for a tonne of ore.
  - For hard rock it would come down to about 1.0 tonnes of water for a tonne of ore.
  - Most of the mines in Kalgoorlie are in the latter category. We have assumed an average of 1.1 tonnes of water for a tonne of ore.

Based on a gold price of about $560 an ounce, these assumptions imply that the value of gold produced from a tonne (kL) of water averages $34.

For nickel, we have also sought additional professional input on conversion ratios. The information is not yet available. For now, calculations have been based on a conservative estimate (the smaller of two available conversion factors *not specific to the region* – 425 tonnes of water to 1 tonne of nickel – was doubled to increase the conservatism of the production estimate). This, coupled with an assumed nickel price of $A17,000 a tonne, results in an effective conversion of a tonne of water to $20 of nickel. This means it is more likely than not that the estimated impact on nickel production could be increased when the information sought on regional conversion factors is available. The figures are in any case dominated by gold, so we believe the overall picture is reasonable and probably conservative – though predicated on the indicated water demand profiles.

The demand series involve no additional growth in industrial demand after year 12, by which time the UUA market research data point to water supplied to new gold production of 11.8ML/d and to new nickel production of 7.9ML/d; these volumes are built into the UUA model of the project as supplied to ERA and as used extensively in its draft report. However, for reasons discussed in our main briefing paper, ERA assumed that these volumes would then be progressively cut back as Kalgoorlie demand grows. The analysis below is predicated on the version of the UUA modelling that incorporates the revised Kalgoorlie demand and that incorporates additional growth in supply, out to 120ML/d. I would expect that UUA is hoping for, and including in the project upside, growth continuing beyond year 12.

Converting to value of production estimates implies a value of annual production from this water of $151m in gold and $28m in nickel.

The resultant value series can be converted to present values, calculated at 6% over 50 years, as follows:

Gold	$2,189m	with associated royalties of $55m
Nickel	$822m	with associated royalties of $21m
Total	$3,011m	with associated royalties of $75m

We stress that these are estimates of the direct *value of production* from the application of UUA water to new mining activities, in contrast to the volumes identified by the market research as substitution for groundwater. These figures include no flow-on effects or multiplier calculations. They are predicated on the demand profiles suggested by UUA's market research.

This expansion in production will require inputs – in many cases, probably at a cost approaching the value of the expanded production – and will need to compete for resources, including labour. These forces will serve to claw back, and probably to claw back very substantially, the resultant *net value* of additional production. As we set in our main briefing, the attribution of benefit (costs avoided by mining, largely inclusive of extra royalties) to access to the lower cost water involves only a very small percentage of the implied value of production, and most of this is likely to arise within the existing production, through the lowering of costs, rather than through the expansion in production.

In broad terms, we agree with the principles illustrated in Figure 1(a) of the just released ERA paper on economic impact assessment. In the jargon, the rectangles in the chart will tend to be large relative to the triangles. However, the evidence from the UUA research that there are reserves that might effectively be isolated at present by the effective unavailability of suitable water, and that might be 'enabled' as a result of access to the new supply, does suggest that the triangles may be more important than is indicated in Figure 1(a) – urging caution before jumping to the simplification set out in Figure 1(b).

Even with clawback, if a substantial proportion of the indicated extra production is realised, the implications for overall activity levels in the Goldfields region, and most probably even in WA as a whole, could be very substantial. Some of the competition for resources will be in international capital markets. Some will compete for resources in other states. Some will compete with other regions in WA. And some will compete with more marginal mining activities in the Goldfields that will not benefit from the new water. We would expect the first four of these to dominate, though the last is unlikely to be negligible.

Input costs, while offsets to net benefits, can be expected to prompt significant increases in regional activity levels. These may well prove to be of significant value to the regional economy, in terms of services from established supply firms and growth in employment. The weight, if any, given to such effects in a final decision will depend on regional development priorities.

Direct project impacts

The UUA project involves major construction in Esperance and along the proposed pipeline. Progressive G&AWS upgrades, if feasible, would also involve significant activity along the existing G&AWS route, as 'bottlenecks' were progressively addressed.

However, structure of the two projects is very different. The G&AWS upgrade, based on the ERA numbers, involves only about two thirds of the direct project costs of the UUA project – it is a smaller project, meeting substantially less demand and starting with significant sunk capital. For this reason, the UUA project will involve greater direct activity levels – with substantially more construction work. The location of this activity will be very different, with the UUA project involving vastly more activity in Esperance and along the new pipeline route. The activity will be more strongly 'front-end loaded', with an immediate big impact, relative to the incremental impact of the G&AWS project.

We provide here an overview of the direct project implications of the UUA project, which UUA might usefully provide to ERA to assist in the weighing of these matters.

We have received from UUA indicative allocations of the likely sharing of the direct spend on the project across regions – Kalgoorlie, Esperance and Rest of WA (essentially Perth). Note that these relate to the direct spend, not to final demand for inputs. The following table summarises these indicative shares of the direct spend.

	Kalgoorlie	Esperance	Other WA	Total WA
Capital				
Plant	0%	14%	2%	16%
Pipeline	10%	90%	0%	100%
Other	0%	20%	64%	84%
O&M	0%	92%	6%	98%

The table makes it clear that the desalination facility will be largely sourced outside of WA, but that about 14% would be sourced at the plant's location in Esperance. On the other hand, direct spend on the pipeline, and on O&M, would be entirely in the regions spanned by the pipeline.

Using these shares, it is possible to develop a breakdown of project spend across the regions. We have used project costs based on the latest version of the project model, incorporating the Water Corporation demand rising to 77ML/d., which involves pushing the system to 120ML/d. To simplify presentation, ongoing capital costs (mainly replacement RO filters) have been aggregated in with Plant, and we have not included administration costs ($31m, with a high proportion likely to fall in Perth).

The following table, showing present values based on 6% over 50 years, emphasises the long-term regional implications of the project for Esperance especially. This of course contrasts with the above metal production effects, which would fall largely in the Kalgoorlie region.

	Kalgoorlie	Esperance	Other WA	Total WA	Total Project
Capital					
Plant	$0m	$27m	$4m	$31m	$190m
Pipeline	$23m	$206m	$0m	$229m	$229m
Other	$0m	$9m	$30m	$39m	$47m
O&M	$0m	$412m	$27m	$439m	$449m
Total	$23m	$654m	$61m	$738m	$915m

We stress that these numbers reflect neither a complete tracking of inputs back to source through an input-output system, nor any tracking of flow-on effects within region and the state. They provide a profile of the project spend. Of course, this spend will have associated with it substantial employment in the regions as indicated. UUA system O&M, dominated by the operation of the desalination plant at Esperance, would involve on-going regional employment and we would expect that very little of this would be of the fly-in fly-out kind referred to in the ERA paper.

Indirect impacts

There are a number of indirect impacts that the project is likely to generate or at least contribute to. They are real and tangible, and in most cases would involve economic benefits focused regionally, but we have not attempted to quantify the benefits. We note the following:

- The introduction of a large base-load electricity customer in Esperance and the beneficial effect on generation load factor, which will play through to better generation and gas contract economics. It is understood that there would be tariff reductions to Western Power as a result of the required increase in gas pressures (ref public statement at GEDC workshop in Esperance on 22nd July 2005).
- Over and above the O&M spend, the dynamic effect of having a substantial new industry in Esperance that demands a range of industry capabilities and workforce skills that will increase the critical mass of demand for such capabilities, which will be available to other customers for those capabilities. For regional communities, having a critical level of demand can make the difference between having local capability and being serviced from Perth.
- Better utilisation of the wind farm would become possible. Currently, the wind farm is switched off at night. With a base load customer, the wind farm would be enabled to operate whenever there was adequate wind.
- Reticulated gas to small communities. United Utilities will be running pump stations along the pipeline which will be powered by gas turbines. These means that small local communities will be able to access reticulated gas because there will be a local pressure reduction station to take gas from the main.

- There will be benefit also from removal of the borefield. With the borefield redundant, the land over it and the buffer zone around it become available for development. This has at least two benefits. First, it means that Esperance is no longer locked in by the coast and the salt lakes, and expansion can proceed in a more orderly manner. Secondly, the land would now have a value and this is a clear benefit. If the land is owned by the Crown or by LandCorp, it would also have an impact on the State Treasury.
- While Esperance has a high number of tourism visits, it has a relatively short length of tourist stay. It has been suggested to us that people are driven away by the taste of the water and the difficulties of laundering clothes etc in the town. This matter requires more investigation before any case can be substantiated.
- Existing agricultural businesses have indicated that they will purchase water for their existing broadacre crops at prices that are commercially-viable to UUA.
- Agricultural users have indicated a keen interest in developing added-value crops and feedlots to take advantage of the new water supply.
- Alternative resource projects will become possible, with consequent new royalty streams. These speculative projects include extended nickel operations around Kambalda and lignite to oil proposals around Salmon Gums.