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Tallowa Pipeline Company

Unsolicited Proposal to New South Wales Government Department of Premier and Cabinet

Business Strategy

TALLOWA TO BASIN WATER TRANSFER PROJECT

4 June 2009

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1 EXECUTIVE SUMMARY

Evans & Peck (E&P) and the Tallowa Pipeline Company (TPC) have collaboratively developed this unsolicited proposal for the Tallowa to Basin Water Transfer Project (TBWTP) for consideration by the NSW Government. The TBWTP is designed to solve both town water supply and environmental water problems in the Sydney-Canberra Corridor Region and in the Murray-Darling Basin:

- Many parts of the Sydney-Canberra Corridor Region, a crucial part of the NSW economy and environment, continue to experience significant growth given the strategic location of the Region between two capital cities. Water supply is one of the most significant issues in the Region; town water supplies for Goulburn, Yass, Marulan, Gunning, Moss Vale and other towns along the proposed route of the TBWTP's pipeline as shown in **Figure 1** are under significant stress in light of changed climatic circumstances. In order to accommodate the planned growth in population, the NSW Government will need to consider options for augmenting the water supply servicing of towns in this region;
- The immediate and longer term water outlook for the Murray-Darling Basin (and the Murrumbidgee, Lachlan and Murray valleys), a key natural resource for the environment and economy of NSW, is bleak due to the impacts of drought, the step change in annual rainfall in eastern Australia, and climate change. This is resulting in reduction of water availability for urban and domestic water supplies and the environment.
- Of the Commonwealth Government's buybacks of water entitlements in the Basin for environmental flows, 97% are from NSW. This is having a disproportionate impact on NSW compared to the other States, with NSW taking swift action to balance water buyback across the Basin, including an embargo on future trades of environmental water until a better balance can be struck.

The proposal includes capturing between 200 and 300 gigalitres (GL)/year of overspill water at Tallowa Dam, using a combination of existing Sydney Catchment Authority (SCA) Shoalhaven Water Supply Transfer Scheme infrastructure and a new 170 km pipeline primarily located within a disused railway corridor, the Moomba to Sydney gas pipeline easement and major road reserves, as shown in **Figure 1**, to transfer water to cities, towns and industries in the Sydney-Canberra Corridor Region and to the Murrumbidgee and Lachlan valleys in the Murray-Darling Basin.

The TBWTP aims to provide:

- Security of water supplies for the growth of Goulburn, Yass, Marulan, Moss Vale, Gunning and other cities, towns, communities and industries in the Sydney-Canberra Corridor Region;
- Security of water supplies for Gundagai, Wagga Wagga, Cowra, Forbes and other inland cities, towns communities and industries in the Murrumbidgee and Lachlan valleys, and for stock and domestic water supplies in these valleys;
- Environmental flows and greater water availability to enhance the watering and environmental health of currently severely stressed riverine and wetland environments in the Murrumbidgee and Lachlan valleys and downstream in the Murray-Darling Basin;
- Through management of Snowy Mountains Scheme releases to the upper Murrumbidgee River, the TBWTP will also provide for additional environmental flows and security of water supplies for cities, towns communities and industries in the Murray River Valley;

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- A new option for the NSW Government which is seeking a better balance for the Commonwealth Government's water entitlements buybacks for environmental flows across Murray-Darling Basin States, by adding to the total volume of the "water pool" available in the Basin;
- Potential to generate hydro-electric power to meet the TBWTP's operating needs.

The TBWTP aims to add to the total volume of the "water pool" available in the Murray-Darling Basin with water from the Shoalhaven Catchment without diminishing any requirements of the Shoalhaven water users (including Sydney) and the environment.

Figure 1 Location of the Tallowa to Basin Water Transfer Project

This is a large infrastructure project with complexities relating to approvals, commercial, political, environmental, funding, technical and construction, and further development of the project requires the support of the NSW Government and Commonwealth Government agencies.

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E&P and TPC propose a staged development of the Business Case, with reference back to the Department of Premier and Cabinet (DPC) at the completion of each stage so that there are "no surprises" when the Business Case is reviewed as per the NSW Gateway Review process:

- Stage 1: Confirmation by the SCA that the water is available for the TBWTP;
- Stage 2: A review by E&P of TPC's work, to provide Government with a level of confidence that the TBWTP's base technical assumptions are reasonable and that there are no technical "show stoppers " that would prevent the project from proceeding or require significant modification of the project;
- Stage 3: A high level study to test the economic viability of the project;
- Stage 4: A suite of studies, listed in **Section 3.11**, to complete the requirements for the Business Case.

E&P and TPC are seeking the support of the NSW Government for this project proposal, specifically:

- Assessment of the merits of the proposal by DPC to determine where it fits in the relative priorities of Government and its agencies;
- A request from DPC to develop a Business Case for the project as the next step in the Gateway Review process;
- Ready access to relevant NSW Government agencies and the information they hold as input to developing the Business Case, including SCA for Stage 1;
- NSW Government funding to develop Stage 2 of the Business Case, to provide Government with a level of confidence that the TBWTP's base technical assumptions are reasonable and that there are no technical "show stoppers ";
- NSW Government funding for the remaining stages of the Business Case;
- An on-going role as adviser to Government for the remaining steps in the TBWTP including development of the Procurement Strategy, managing the competitive procurement process, and implementing the construction contract(s).

E&P and TPC have developed the proposal in accordance with the NSW Government's *Working with Government: Guidelines for Privately Financed Projects* (2006). The proposal is structured as the Business Strategy for the TBWTP, the first step in NSW Treasury's *Gateway Review System* (2006). Using this approach ensures that we have addressed Government's questions of the project at this first step. Our approach will also assist Government's Strategic Review of the project to assess that it:

- Is aligned with the Government and agencies' strategic plans;
- Demonstrates that the TBWTP is the best value means of servicing the community needs in the Sydney-Canberra Corridor Region, and community and environmental needs in the Murray-Darling Basin (Murrumbidgee, Lachlan and Murray valleys).

This proposal demonstrates overall community benefits to NSW and the Murray-Darling Basin and is consistent with the NSW and Commonwealth Government's plans and priorities.

2 INTRODUCTION

TPC has used its in-house resources to develop preliminary investigations for the TBWTP, as documented in the Rainsaver (November 2008) report *The Tallowa Pipeline Revised Report*. E&P and TPC have developed this unsolicited proposal of the project to the NSW Government for its consideration.

E&P and TPC have developed the proposal in accordance with the NSW Government's *Working with Government: Guidelines for Privately Financed Projects* (2006). The proposal is structured as the Business Strategy for the TBWTP, the first step in NSW Treasury's *Gateway Review System* (2006). Using this approach will assist Government's Strategic Review of the TBWTP to assess that it:

- Is aligned with the Government and agencies' strategic plans;
- Demonstrates that the project is the best value means of servicing the community need in the Sydney-Canberra Corridor Region, and community and environmental needs in the Murray-Darling Basin (Murrumbidgee, Lachlan and Murray valleys).

This Business Strategy addresses several of the success factors considered by the Strategic Review including:

- Need for the TBWTP (Service Delivery);
- Value for Money;
- Sustainability;
- Management of Business Case Preparation.

The remaining three factors of Risk Management, Stakeholder Management and Change Management considered by the Strategic Review will be addressed in the development of the Business Plan.

3 NEED FOR THE TALLOWA TO BASIN WATER TRANSFER PROJECT

This Section identifies the need for the TBWTP and the service needs to be delivered. It examines:

- The requirement for urban water supplies and water security for the Sydney-Canberra Corridor Region;
- The water outlook for the Murray-Darling Basin including the reduction in water availability for urban and domestic water supplies and the environment;
- The Commonwealth Government's buybacks of water entitlements for environmental flows which (at 97% from NSW) is having a disproportionate impact on NSW compared to the other States.

The project aligns with the NSW Government's priorities and State Plan objectives.

3.1 Need for the Project: Sydney-Canberra Corridor Region

As reported by the Department of Planning (2008), many parts of the Sydney-Canberra Corridor Region (**Figure 1**) continue to experience significant growth given the strategic location of the Region between two capital cities. It is a crucial part of the NSW economy and environment. As the Region supports its own water supply and includes Sydney's drinking water catchment, the long-term strategy identifies water resources and key areas supporting biodiversity and water quality.

Water supply is one of the most significant issues in the Region. Future growth and development of the Region relies on a secure water supply for people, industry and the environment (*Department of Planning, 2008*). The population of the Region is expected to grow by around 46 350 people over the period to 2031, with 25 200 new homes and industries supporting 27,800 new jobs. Add to this the uncertainty of drought - parts of the region such as Goulburn have experienced severe water shortages as a result of the recent drought - and climate change and it is clear that long term planning for water supplies is required as an integral part of strategic planning for the Region. This means securing an adequate water supply for communities within the Region, while recognising that many of the regional communities are located within the drinking water catchment of Australia's largest city. The location of future population growth will be strongly influenced by the capacity to provide potable water.

Providing sufficient water in the longer term will also be a significant challenge for future economic growth, especially in the southern and central parts of the Region. Town water supplies for Goulburn, Yass, Marulan, Gunning and Moss Vale and other towns along the proposed route of the TBWTP's pipeline as shown in **Figure 1** are under significant stress in light of changed climatic circumstances. In order to accommodate the planned growth in population, the NSW Government will need to consider options for augmenting the water supply servicing of towns in this region.

3.2 Need for the Project: Murray-Darling Basin Outlook

The immediate and longer term outlook for the Murray-Darling Basin, a key natural resource for the environment and economy of NSW, is bleak due to the impacts of drought, the step change in annual rainfall in eastern Australia, and climate change.

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3.2.1 Importance of the Murray-Darling Basin to NSW

The Murray–Darling Basin is the catchment for the Murray and Darling rivers and their many tributaries. The Basin includes three-quarters (around 607,000 km^2) of NSW, all the state's inland river valleys and important groundwater aquifers.

The Basin is Australia's most important agricultural area, producing over one-third of Australia's food supply. It is also home to more than 2 million residents. The Basin generates 39% of the national income derived from agricultural production and includes 65% of Australia's irrigated agricultural land. It produces 53% of Australian cereals grown for grain (including 100% of rice), 95% of oranges, and 54% of apples. The Basin supports 28% of the nation's cattle herd, 45% of sheep, and 62% of pigs (*Murray-Darling Basin Authority website (MDBA), 2009*).

There is considerable variation in rainfall runoff from one part of the Basin to another, and this variation bears little relationship to catchment size. The catchments draining the Great Dividing Range on the south-east and southern margins of the Basin, including the Murrumbidgee and Lachlan catchments, contribute most to total runoff. These two catchments combined cover 16% of the Basin, account for 21% of the Basin's total runoff, and 23% of surface water use.

Many of the Basin's natural resources are of high environmental value. Its wetlands are extensive and perform essential hydrological, ecological and chemical functions, which support and maintain the productivity and health of the river systems. A number of the Basin wetlands are recognised under the Ramsar Convention on Wetlands of International Importance (*MDBA, 2009*).

3.2.2 Drought

The *MDBA (2009)* Drought Update stated that Murray inflows between January and March 2009 were the lowest in 117 years and the outlook for the 2009-10 water year was also looking bleak, with low storage levels and the rainfall outlook for the next three months over the southern Basin being for drier than average conditions. As shown in **Figure 2**, total inflows for the first three months of this year were 140 GL, slightly lower than the previous historic minimum of 150 GL in January-March 2007.

Murray system inflows for the three years ending in March were 5,160 GL, or 46% of the previous three year minimum of 11,300 GL in 1943 to 1946. The persistence and severity of the drought, particularly over the past three years, is unprecedented. All three States have set aside enough water to meet critical human water needs in 2009-10, but the prospects for irrigation will be highly dependent on future rainfall and system inflows. The MDBA's total active (useable water) storage was only 950 GL or 11 per cent of capacity, well below the March long term average of 4,400 GL. Total storage across the whole Basin remains low at about 18 per cent.

The *MDBA (2009)* stated that flows to South Australia would continue below normal entitlement rates until there was a significant improvement in water availability. The water level in Lake Alexandrina was at record low levels and its salinity has risen. Wetland and floodplain ecosystems across the entire Murray system would continue to be severely impacted by the prolonged dry conditions.

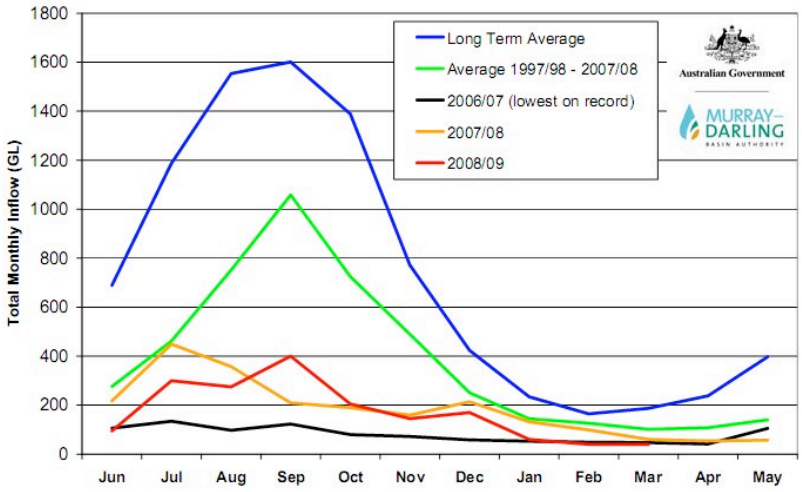
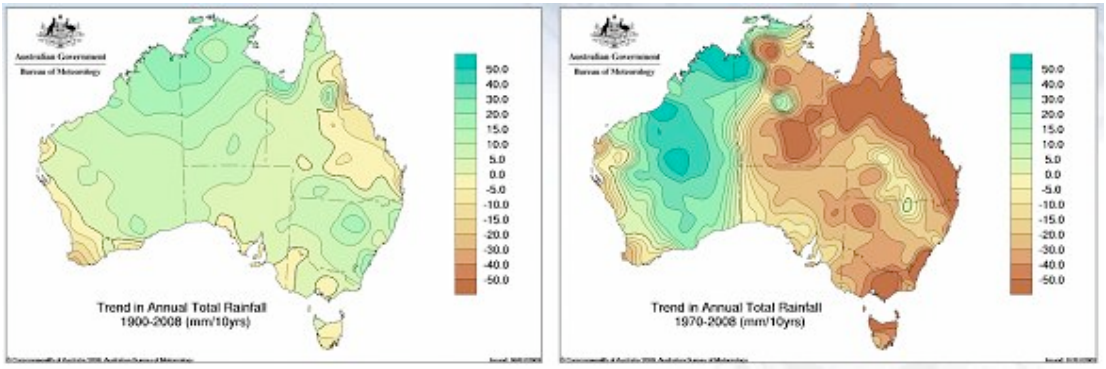


Figure 2 River Murray System Inflows (excluding Snowy and Darling inflows)

In a further development, an *Australian National University (2009)* media release quoted a study by Leblanc and Tregoning which showed that drought has stripped 200,000 GL of water from soil moisture and groundwater systems from the Basin over the past eight years. This underscores the point that even if the Basin gets massive rains, it will basically just re-wet the system; it will not result in the floods the Basin has experienced in the past.

3.2.3 Step Change in Annual Rainfall in Eastern Australia

McLeod (2009) has used information from the Bureau of Meteorology in **Figure 3** to show that there has been a step change in annual total rainfall in eastern Australia for the period since 1970. This has included a major reduction in rainfalls over south-eastern Australia, including the Murray-Darling Basin and catchments such as the Murrumbidgee and Lachlan valleys. The result of this reduction in rainfall is a step change – a reduction – in the annual yield of the Murray-Darling Basin, as shown in **Figure 4**. The average annual Basin yield since 1996/97 is 49% of the previous average yield, resulting from the combined impacts of the step change in rainfall and the prolonged drought.



Trend: Year 1900-2008 Trend : Year 1970-2008

Figure 3 Step Change in Australian Annual Total Rainfall

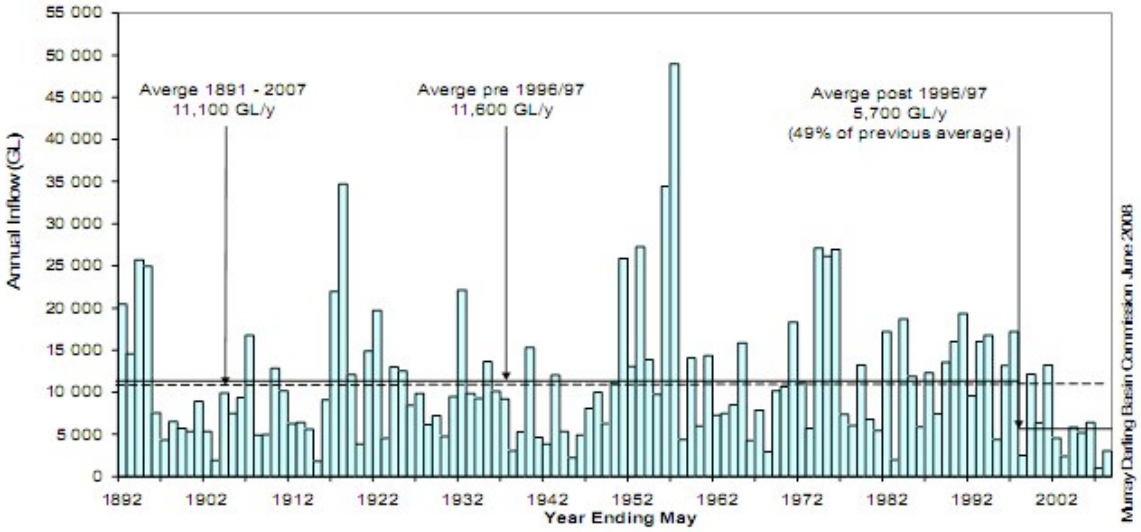


Figure 4 Step Change in Annual Yield of the Murray-Darling Basin

3.2.4 Climate Change

The CSIRO (2008) *Murray-Darling Basin Sustainable Yields Project* reports on the sustainable yield of surface water and groundwater systems within the Basin. The project has carried out rigorous and detailed Basin scale assessment of the anticipated impacts of climate change, catchment development and increasing groundwater extraction on the availability and use of water resources.

The CSIRO project has found that:

- For the Murrumbidgee catchment, average surface water availability under the historical climate is 4270 GL/year. The relative level of surface water use under current high level of development is 53% (2257 GL/year). Under the best estimate of climate change by 2030, the average surface water availability would reduce by 9% or 384 GL;
- For the Lachlan catchment, average surface water availability under historical climate is 1139 GL/year and about 28% (321 GL/year) is used. Under the best estimate of climate change by 2030, average surface water availability would reduce by 11% (125 GL);
- For the Murray region, average surface water availability under the historical climate is 11,162 GL/year. The relative level of surface water use under the current high level of development is 36% (4045 GL/year). Under the best estimate of climate change by 2030, the average surface water availability would reduce by 14% or 1560 GL.

3.3 Need for the Project: Commonwealth Government Buybacks of Water Entitlements for Environmental Flows

The Commonwealth Government is purchasing water entitlements from willing sellers in the Murray-Darling Basin under programs of the Government's *Water for the Future Policy*. $3.1 billion will be spent on water purchased under this program over 10 years, with the water to be used in accordance with the environmental watering plan of the Basin. This water is held by the Commonwealth Environmental Water Holder, as described on the Department of Environment, Water, Heritage and the Arts website (2009).

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On 28 May 2009, the Commonwealth Government announced the purchase of 240 GL of water entitlements with different classifications of entitlement, but largely general and supplementary security, from Twynam Agricultural Group in NSW.

Purchases such as these are at the expense of reducing the amount of water available for irrigation and other industry uses, as there is no additional water in the "pool" available within the Basin. A major problem with this approach, as stated by the NSW Minister for Water in his media release on 28 May 2009, is that to date around 97% of the Commonwealth Government's buybacks in the Murray-Darling Basin have come from NSW, and that this is having a disproportionate impact on NSW compared to the other States.

The Minister stated that the NSW Government supports protecting the health of the Murray-Darling Basin and recognises that strategic water buybacks make a contribution to sustaining the Basin's environment. However, there is a need to urgently balance water purchases between all the Murray-Darling Basin States.

As a result, NSW is acting swiftly to balance water buyback across the Basin, including an embargo on future trades of environmental water until a better balance can be struck.

3.4 Addressing the Needs: Tallowa to Basin Water Transfer Project

The TPC has conducted preliminary investigations identifying that between 200 and 300 GL/year of water is available as overspill from Tallowa Dam, for transfer 233 days per year on average (**Appendix 1**).

The proposal includes capturing between 200 and 300 gigalitres (GL)/year of overspill water at Tallowa Dam, using a combination of existing Shoalhaven Water Supply Transfer Scheme infrastructure (owned and operated by the Sydney Catchment Authority) and a new 170 km pipeline primarily located within a disused railway corridor, the Moomba to Sydney gas pipeline easement and major road reserves, as shown in **Figure 1**, to transfer water to towns in the Sydney-Canberra Corridor Region and to the Murrumbidgee and Lachlan rivers in the Murray-Darling Basin.

The TBWTP aims to provide:

- Security of water supplies for the growth of Goulburn, Yass, Marulan, Moss Vale, Gunning and other cities, towns, communities and industries which are part of the Sydney-Canberra Corridor Region;
- Security of water supplies for Gundagai, Wagga Wagga, Cowra, Forbes and other inland cities, towns communities and industries in the Murrumbidgee and Lachlan valleys, and for stock and domestic water supplies in these valleys;
- Environmental flows and greater water availability to enhance the watering and environmental health of currently severely stressed riverine and wetland environments in the Murrumbidgee and Lachlan valleys and downstream in the Murray-Darling Basin;
- Through management of Snowy Mountains Scheme releases to the upper Murrumbidgee River, the TBWTP will also provide for additional environmental flows and security of water supplies for cities, towns communities and industries in the Murray River Valley;
- A new option for the NSW Government which is seeking a better balance for the Commonwealth Government's water entitlements buybacks for environmental flows

across Murray-Darling Basin States, by adding to the total volume of the "water pool" available in the Basin;

- Potential to generate hydro-electric power to meet the TBWTP's operating needs.

The TBWTP aims to add to the total volume of the "water pool" available in the Murray-Darling Basin with water from the Shoalhaven Catchment without diminishing any requirements of the Shoalhaven water users (including Sydney) and the environment.

Preliminary assessment indicates that the TBWTP will provide greater water availability to enhance the watering and environmental health of currently severely stressed riverine and wetland environments in the Murrumbidgee, Lachlan and Murray valleys in the Murray-Darling Basin.

The major elements of the TBWTP that have been developed by TPC include:

3.4.1 Availability of Water at Tallowa Dam

The availability of water for extraction is the most significant element of the TBWTP. Tallowa Dam was constructed in 1976, creating Lake Yarrunga storage which holds around 90 GL. With a large catchment area of 5750 km^2, Tallowa Dam regularly spills, with flows down the Shoalhaven River often causing flooding in Nowra, Bomaderry and on the adjacent floodplain.

The Shoalhaven Scheme, of which Tallowa Dam is part, operates as a drought reserve scheme. Pumping from the scheme has occurred three times since it began operating in 1977; 1981-1983, 1993-1994 and 2003-2008 as shown in **Figure 5** (Sydney Catchment Authority, 2006).

In November 2008, the NSW Government announced a three year moratorium on the transfer of water from Tallowa Dam to augment Sydney's drinking water supply. **Figure 5** also shows the large volumes of water that annually overflow Tallowa Dam (the area shaded pink between Tallowa inflow - pink line – and Shoalhaven transfers – blue line).

TPC has modelled the performance of Tallowa Dam storage for the period 1976 to 2007 (summarised in **Appendix 1**) including the requirements of current Shoalhaven water users, Sydney and the environment, and concluded that large volumes of water are available for extraction for the TBWTP. Potentially 316 GL/year on average could have been transferred to the Sydney-Canberra Corridor Region and the Murray-Darling Basin, on an average of 233 days per year. The average annual spill over Tallowa Dam (after deducting transfers to the TBWTP, current Shoalhaven water users, Sydney and the environment) is 561 GL, ranging from 2,955 GL to 0 GL.

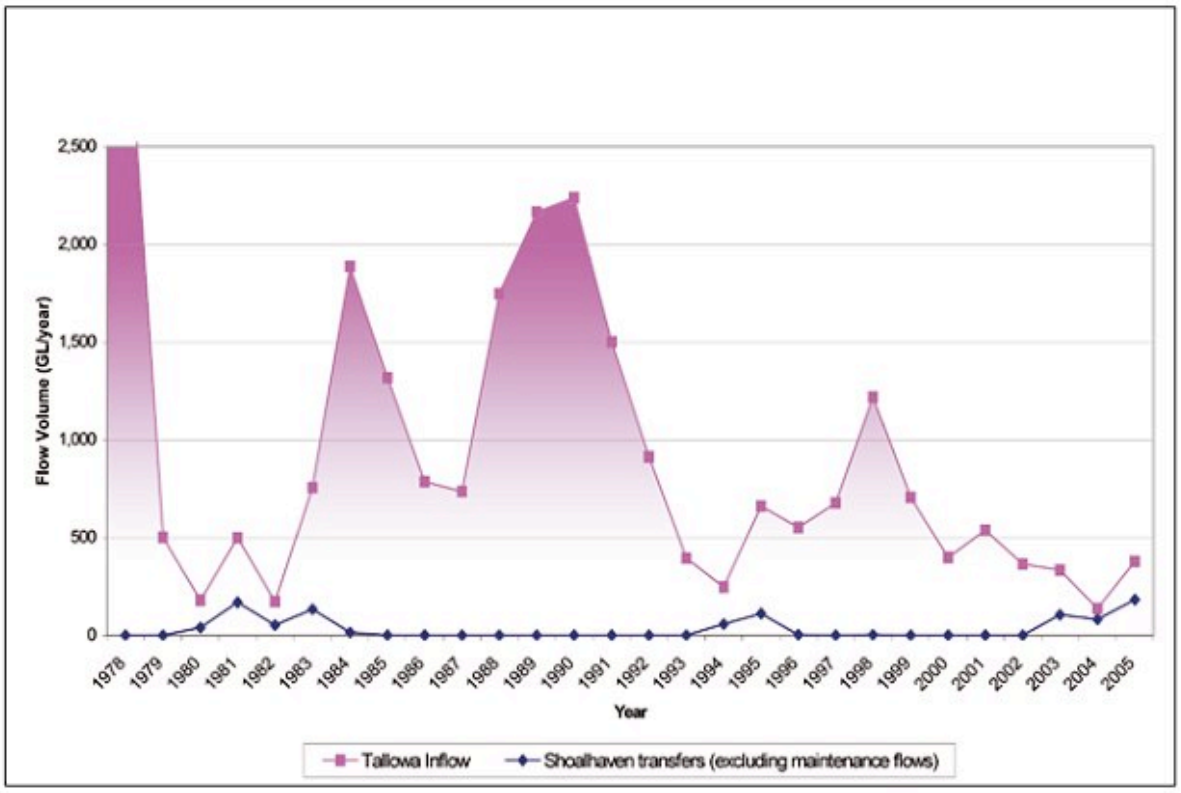

Figure 5 Annual inflows to Tallowa Dam and transfers to Sydney

3.4.2 Capacity of Water Transfer Infrastructure

The TBWTP relies on gaining access to existing pump, pipe and tunnel infrastructure that is currently used to extract water from Tallowa Dam storage and transferring it to the Sydney storage dams via Fitzroy Falls Dam, Wingecarribee Reservoir and thence into the river systems. Currently pumping stations powered by hydroelectric generators lift water from Tallowa Dam storage 612 m to Fitzroy Falls Dam and Wingecarribee Reservoir. Pumping capacity of the system is 205 ML/hour (around 4.9 GL/day). During the recent drought years up to 7-8 GL/week were delivered to Sydney water supply.

TBWTP water would be accessed by tapping into the Burrawang Tunnel that joins Fitzroy Falls Dam and Wingecarribee Reservoir at a location relatively close to the reservoir (**Figure 6**).

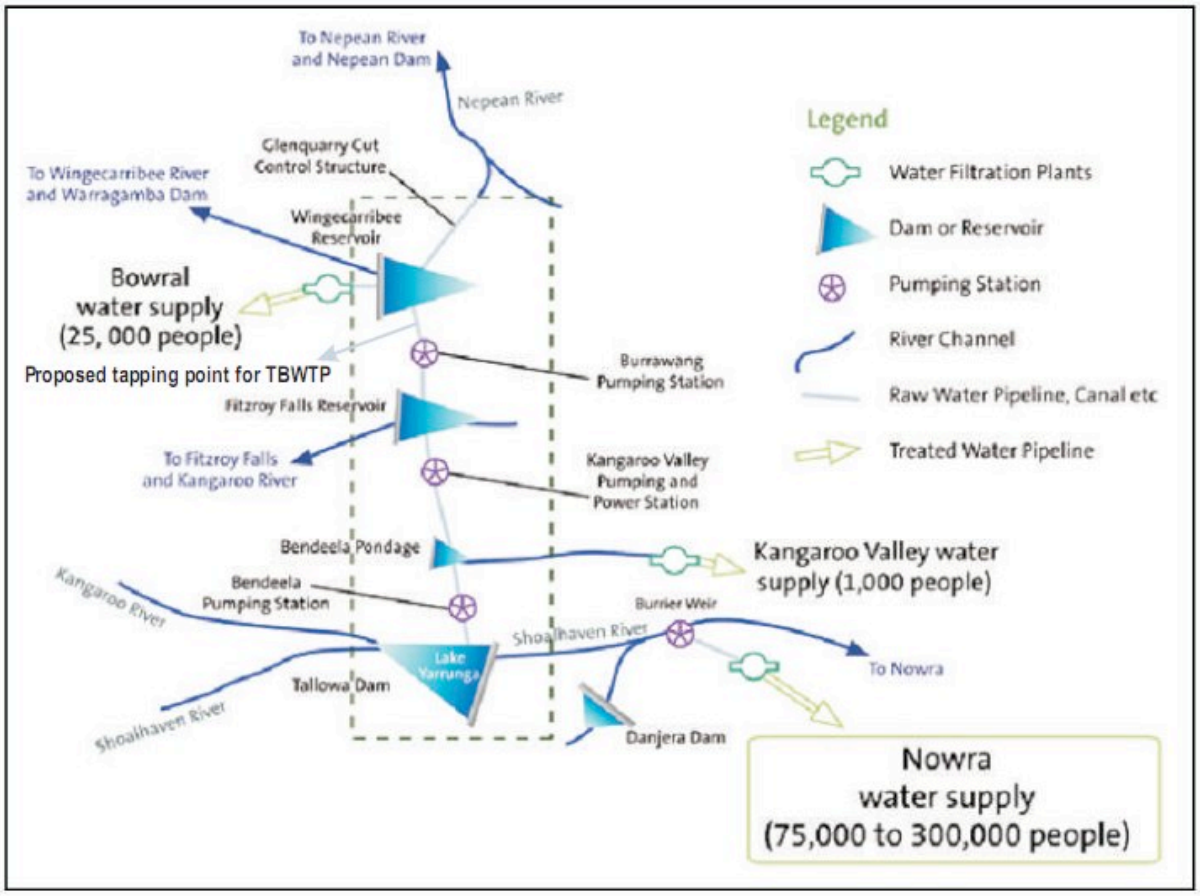

Figure 6 Shoalhaven Water Supply Transfer Scheme showing the proposed tapping point for the TBWTP

3.4.3 New Pipeline Alignment

The TBWTP proposes a new pipeline of 170 km in length. Water would be pumped into the pipeline at a pump station at the tapping of the Burrawang Tunnel. The pipeline would be located within the abandoned Unanderra to Moss Vale railway easement to Moss Vale (13 km), within the Moomba to Sydney Gas Pipeline easement from Moss Vale to a point adjacent to Gunning (106 km), the Gunning Road reserve from where it leaves the gas pipeline easement to the Hume Highway at Gunning (8 km), and within the Hume Highway easement from Gunning to Yass (33 km). The pipeline would terminate at Yass Reservoir at which point the water enters the Murrumbidgee River. A spur off this pipeline is proposed to transfer water to the Lachlan River near Dalton. The spur would be located primarily within the gas pipeline easement and is approximately 15 km in length.

3.4.4 Pipeline Sizing

The TPC's investigations have concluded that a pipeline of up to 2.5 m diameter will be required to transfer the water to Gunning, with pipelines of up to 2.1 m diameter from Gunning to Yass and Dalton. These investigations initially required the development of a surface level profile for the chosen route alignment followed by a hydraulic assessment in order to match the pipeline length, surface levels, required flow rates with a pipeline diameter and pipe parameters.

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3.4.5 Pumping Infrastructure

Associated with the pipeline sizing activity described above, the hydraulic assessment has determined the need for one pumping station to lift the water 20 metres. From thereon, flow is under gravity to the Murrumbidgee and Lachlan rivers. The capacity of the existing electricity network to support this pumping station needs to be investigated.

3.4.6 Water Storages

No new water storages are required. Water from the pipeline will be supplied:

- Directly to town water supply storages in the Sydney-Canberra Corridor Region;
- To the Yass River where it will flow into Burrinjuck Dam and the Murrumbidgee River downstream of Yass;
- To the Lachlan River where it will flow into Wyangala Dam downstream of Dalton.

3.4.7 Generation of Hydro-electricity

The proposed pipeline would have a fall of 110 m in 120 km between Moss Vale and Dalton (1:1100) and a fall of 70 m in around 50 km (1:710) between Dalton and Yass. These falls have the potential energy to support two mini hydro plants which could be built within both the gas pipeline easement and in the Gunning Road reserve, requiring little if any private land. The capacity, feasibility and cost of producing hydro-electricity needs to be investigated, as it could in part offset the TBWTP's operating energy needs to pump water from Fitzroy Falls/Wingecarribee to Moss Vale.

3.5 Government's Priorities and Objectives

The TBWTP is aligned with the NSW Government's and agencies' priorities and objectives:

- **NSW Government State Plan (2006)**
  Priority E1: *A secure and sustainable water supply for all users*
  Targets include:
  - *Meet performance standards for water supply reliability and quality*
  - *Restore water extraction from rivers to sustainable levels*

  Priority E4: *Better outcomes for native vegetation, biodiversity, land, rivers and coastal waterways*
  Targets include:
  - *By 2015 there is an improvement in the condition of riverine ecosystems*;
  - *By 2015 there is an improvement in the condition of important wetlands and the extent of those wetlands is maintained*
- **NSW Government State Infrastructure Strategy 2008-09 to 20017-18 (2008)**
  The Strategy notes that infrastructure to support industry is vital to the prosperity of the NSW economy. Initiatives include:
  - *Assistance will be provided to Goulburn-Mulwaree Council to construct a transfer pipeline. This will provide greater drought security in that region;*
  - *The Government will continue to maintain dam integrity and security of rural water supply;*
  - *Continuation of investment in long-term projects, such as the Tillegra Dam, the country Towns Water Supply and Sewerage Scheme and rural dam upgrades will ensure long-term water security.*

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- **Sydney-Canberra Corridor Regional Strategy (2008)**
  Actions include:
  - *Local environmental plans will recognise and protect the regional water supply system through appropriate planning provisions;*
  - *In preparing local environmental plans councils will liaise with water and energy providers and make provision for any regional gas, water and electricity infrastructure corridors that may be required;*
  - *New residential release areas are to demonstrate availability of a secure water supply to the satisfaction of the relevant water supply authority.*

3.6 Proponents' Proposal

E&P and TPC are seeking the support of the NSW Government for this project proposal, specifically:

- Assessment of the merits of the proposal by DPC to determine where it fits in the relative priorities of Government and its agencies;
- A request from DPC to develop a Business Case for the project as the next step in the Gateway Review process;
- Ready access to relevant NSW Government agencies and the information they hold (identified in **Sections 3.8** to **3.10**), as input to developing the Business Case, including access to SCA for Stage 1;
- NSW Government funding to develop Stage 2 of the Business Case, to provide Government with a level of confidence that the TBWTP's base technical assumptions are reasonable and that there are no technical "show stoppers ";
- NSW Government funding for the remaining stages of the Business Case;
- An on-going role as adviser to Government for the remaining steps in the TBWTP including development of the Procurement Strategy, managing the competitive procurement process, and implementing the construction contract(s).

3.7 Investigations to Develop the Business Case

E&P and TPC propose a four-stage development of the Business Case, with reference back to DPC at the completion of each stage so that there are "no surprises" when the Business Case is reviewed in the Gateway Review process. Furthermore, the TBWTP is still confidential at this stage, and it is desirable to limit the distribution of project related information. The stages include:

- Stage 1: Confirmation by the SCA that the water is available for the TBWTP;
- Stage 2: A review by E&P of TPC's work, to provide Government with a level of confidence that the TBWTP's base technical assumptions are reasonable and that there are no technical "show stoppers " that would prevent the project from proceeding or require significant modification of the project;
- Stage 3: A high level study to test the economic viability of the project;
- Stage 4: A suite of studies, listed in **Section 3.11**, to complete the requirements for the Business Case.

3.8 Stage 1 of the Business Case – Water Availability

3.8.1 Availability of Water at Tallowa Dam

The SCA is responsible for managing the Shoalhaven Catchment and associated water use. Given the fundamental importance of the availability of water to the TBWTP, it is proposed that E&P approach the SCA to determine the validity of the water availability assumptions in **Appendix 1**.

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E&P will ensure that the TPC's assumptions are collated into a document for briefing the SCA, who would then need to carry out its own investigations and provide confirmation of the likely quantities of water available for transfer by the TBWTP.

E&P will co-ordinate discussions with the SCA. E&P requests that DPC arrange for the appropriate senior personnel from SCA to be made available to complete these investigations.

3.8.2 Deliverables for Stage 1 of the Business Case

E&P will produce a report for Government including:

- Information on the validity of the water availability assumptions in **Appendix 1;**
- Proposed studies, costing and timing for Stage 2 of the Business Case (see **Section 3.9**).

3.9 Stage 2 of the Business Case – Technical Review

E&P proposes that the following investigations be carried out to test and confirm the base technical assumptions of the TBWTP.

3.9.1 Capacity of Water Transfer Infrastructure

E&P is aware that the operating protocols for transferring water from the Shoalhaven Catchment to Sydney storage dams are quite complex, including for reasons related to restrictions in the rate of filling and drawing down the levels in Fitzroy Falls Dam and Wingecarribee Reservoir. Increasing the required transfer volumes due to the additional requirements of the TBWTP may add to these complexities, quite apart from the issue of whether or not the physical infrastructure has the capacity to transfer the additional project water as well as the transfers to Sydney.

E&P will approach the SCA, as owner and operator of this water transfer infrastructure, to determine if there is capacity in the infrastructure to transfer TBWTP water, from both a physical infrastructure and an operations perspective.

The SCA's findings should be incorporated into the report on water availability referred to above. E&P will co-ordinate discussions with the SCA. E&P requests that DPC arrange for the appropriate senior personnel from SCA to be made available to complete these investigations.

3.9.2 New Pipeline Alignment

The pipeline alignment in the TBWTP assumes that virtually all of the pipeline can be located within existing easements, whether they be railway, gas pipeline or road easements. This would result in minimal need for private land acquisition and help speed project delivery, as it would simplify the planning and approvals process considerably.

The validity of using this assumed alignment will need to be determined by detailed route engineering studies that will require communicating with a number of stakeholders.

Pipelines of up to 2.5m diameter, being the sizes contemplated for the TBWTP, will require a large area for construction. Experience also shows that there are significant restrictions when construction is contemplated alongside a gas pipeline (about 66% of the route), and these could render the co-location of the water pipeline within the gas pipeline easement not feasible. The particular restrictions or otherwise that would apply to this project can only be determined by carrying out detailed investigations.

Should the pipeline location assumptions be shown to be incorrect, it is likely that a similar alignment could be determined, albeit that alignment would involve significantly greater land acquisition costs and have planning, environmental and community implications. There are significant risks to the project associated with the route alignment for the pipeline.

E&P will prepare concept drawings depicting the assumed alignment and associated long sections for the pipeline, by reference to the work done by TPC. Existing information relating to the alignment of the disused railway, gas pipeline easement and the Hume Highway, if available, will be incorporated into these concept drawings. These drawings will provide clearer documentation of the assumed alignment and better facilitate further investigations into the project.

At this early stage of investigation no detailed study work will be carried out to investigate construction techniques and costs.

3.9.3 Pipeline Sizing and Pumping Infrastructure

The work carried out by TPC to determine pipe sizes and pumping requirements will be reviewed and verified. E&P will use the alignment and long section drawings that it prepares (described in **Section 3.9.2**) along with the available flow rates as determined by the SCA (described in **Sections 3.8** and **3.9.1**) to determine the hydraulic profile, provide approximate pipe sizes and pipe pressure ratings and identify the need for the initial and any intermediate pump stations.

At this early stage of investigation no work will be carried out to determine other essential pipeline infrastructure such as air valves, isolation valves or scour valves, etc.

3.9.4 Inputs Required from Government Agencies

TPC's investigations to date (*Rainsaver, November 2008*) have largely relied on information that is publicly available. However it is important that more accurate information now be sourced to support these further investigations proposed by E&P. Useful and relevant information is likely to be held by Government agencies and this needs to be sourced to assist these investigations.

Information relating to the project alignment and the associated surface level profile includes:

- Alignment information (horizontal and vertical) for the disused Unanderra-Moss Vale railway between Wingecarribee Reservoir and Moss Vale, presumably held by the Rail Infrastructure Corporation (RIC);
- Alignment information (horizontal and vertical) for the Moomba to Sydney gas pipeline between Moss Vale and Dalton, presumably held by the Department of Water and Energy;
- Alignment information (horizontal and vertical) for the Hume Highway between Gunning and Yass, presumably held by the Roads and Traffic Authority.

This information will be used to supplement information in the *Tallowa Pipeline Revised Report* (*Rainsaver, November 2008*) and the outputs from interviews of key TPC personnel. Request Government arrange for this information to be sourced and provided to E&P. The information should preferably be in a format that facilitates its further use in a CAD application.

3.9.5 Deliverables for Stage 2 of the Business Case

E&P will produce a report for Government including:

- An independent review of TPC's work, to provide Government with a level of confidence that the Project's base technical assumptions are reasonable and that there are no technical "show stoppers ";
- Information on available water and the capacity of existing infrastructure to transfer TBWTP water;
- CAD drawings depicting the pipeline alignment and associated long sections;
- Proposed studies, costing and timing for Stage 3 of the Business Case (**Section 3.10**).

3.10 Stage 3 of the Business Case – Economic Viability

3.10.1 High Level Economic Viability

E&P will conduct a high level study to test the economic viability of the project. This will include:

- Developing cost estimates of the capital and operating costs of the project;
- Liaising with the SCA to identify any Shoalhaven Water Supply Scheme capital and operating costs that would apply to the TBWTP;
- Liaising with the Departments of Planning and Commerce to develop forward projections and costs for urban and industry water supply requirements in the Sydney-Canberra Corridor Region and in the Murrumbidgee and Lachlan Valleys;
- Liaising with the Department of Environment and Climate Change and the MDBA to quantify the environmental water requirements for the Murrumbidgee, Lachlan and Murray valleys, the availability and cost of that water.

E&P will co-ordinate discussions with the SCA, the Departments of Planning, Commerce and Environment and Climate Change, and the MDBA. E&P requests that DPC arrange for the appropriate senior personnel from SCA and the Departments of Planning, Commerce and Environment and Climate Change to be made available to provide information required for these investigations.

3.10.2 Deliverables for Stage 3 of the Business Case

E&P will produce a report for Government including:

- Information on the economic viability of the project;
- Proposed studies, costing and timing for Stage 4 of the Business Case (**Section 3.11**).

3.11 Stage 4 of the Business Case

As noted in **Section 3.7**, E&P and TPC propose a staged development of the Business Case, with reference back to Government at the completion of each stage so that there are "no surprises" when the Business Case is completed. As part of the Stage 3 report, we will propose studies, their costing and timing for Stage 4 of the Business Case. The studies will result in a number of documents for review in the Gateway Review process, including:

- Draft Business Case
- Feasibility/Options Study (including the Stage 2 report)
- Value Management Study
- Financial Appraisal
- Economic Appraisal (including the Stage 3 report)
- Financial Plan
- Asset Strategy
- Project Brief

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- Project Cost Estimate
- Environmental Assessment
- Outline Change Management Plan
- Outline Stakeholder Management Plan
- Outline Risk Management Plan

3.12 Other Options to Meet the Service Need

The Business Case will identify if there are other options available to transfer 200 GL to 300 GL of water for urban and industry use in the Sydney-Canberra Corridor Region, and additional water into the Murray-Darling Basin - the upper Murrumbidgee and Lachlan valleys- to deliver environmental benefits and water supply security.

Options currently being used to provide additional environmental water in the Basin include purchasing water entitlements for environmental flows. This is at the expense of reducing the amount of water available for irrigation and other industry uses, as there is no additional water in the "pool" available within the Basin. A major problem with this approach, as stated in **Section 3.3**, is that to date around 97% of the Commonwealth Government's buybacks in the Murray-Darling Basin have come from NSW, and that this is having a disproportionate impact on NSW compared to the other States. NSW is acting swiftly to balance water buyback across the Basin, including an embargo on future trades of environmental water until a better balance can be struck.

The TBWTP will increase the size of the water "pool" available within the Basin, and help NSW contribute to environmental flows without the need for further buybacks of water currently used for production within the Basin.

4 VALUE FOR MONEY

The TBWTP will provide value for money.

4.1 Preliminary Financial and Economic Appraisal

A comprehensive cost estimate for the TBWTP is to be prepared by E&P as part of Stage 3 of the Business Case. E&P's preliminary assessment considers this project's capital funding requirements could be around $1.5 billion.

As noted in **Section 3.3**, the Commonwealth Government is purchasing water entitlements from willing sellers in the Murray-Darling Basin under programs of the Government's *Water for the Future Policy*. The Commonwealth Government provides regular updates of the market prices for approved transfers of water entitlements (*Department of Environment, Water, Heritage and the Arts, 2009*). The current price of high security water in the Murrumbidgee Valley is $3,100/ML, and this price has been steadily rising over time. Applying this price to up to 300 GL of water from the TBWTP would equate to a cost of $930 million.

In addition, water for urban and industry use has a high and increasing price, and is charged annually. Water usage pricing by Sydney Water is currently $1.61/kL for tier 1 (up to 1.096 kL/day) domestic users and for commercial and industrial properties. This equates to $1,610/ML **annually**. For use above 1.096 kL/day, the domestic charge is $1.83/kL.

A detailed economic appraisal of the cost and use of TBWTP water compared with the cost and use of urban and industrial water in the Sydney-Canberra Corridor Region, and of environmental water purchased within the Murray-Darling Basin, and in particular in the Murrumbidgee and Lachlan catchments, will be carried out by E&P as Stage 3 the Business Case.

An important issue to be resolved is *who would own the TBWTP pipeline and associated infrastructure?* Is it to be owned by the private sector, by the Commonwealth and/or NSW governments, or by a public-private partnership? Major issues will be the return on shareholders' investment and the assigning of risk.

4.2 Funding for the TBWTP

Funding options will need to be developed and examined in detail as part of the studies to develop Stage 4 of the Business Case. Options include:

- Commonwealth / NSW governments and Local Councils funding a pipeline operator for the project for annual purchases of water for town water supply and environmental purposes;
- The Commonwealth Government purchasing the water entitlements under the $3.1 billion *Restoring the Balance in the Basin* program, with funding used to fund the project. This would be carried out in lieu of or in addition to purchasing water entitlements in the Murrumbidgee and Lachlan valleys;
- The Commonwealth Government purchasing the water entitlements under the $5.8 billion *Sustainable Rural Water Use and Infrastructure* program, with funding used to fund the project.

5 SUSTAINABILITY

The TBWTP aims to meet the needs of cities, towns and industries in the Sydney-Canberra Corridor Region and cities, towns and the environment in the Murray-Darling Basin in NSW – Murrumbidgee, Lachlan and Murray valleys - without compromising the ability of future generations in the Shoalhaven Catchment, Sydney and the Murray-Darling Basin to meet their needs. **The sustainability benefits outlined below will be better described, assessed and where possible quantified in Stages 3 and 4 of the Business Case.**

5.1 Social Impacts

Preliminary assessment indicates that the TBWTP will provide greater water security and hence have positive social impacts that will benefit cities, towns and communities in the Sydney-Canberra Corridor Region and in the Murrumbidgee, Lachlan and Murray valleys.

5.2 Economic Impacts

Preliminary assessment indicates that the TBWTP will provide greater water security, additional water and hence have positive economic impacts that will benefit cities, towns, communities and industries in the Sydney-Canberra Corridor and in the Murrumbidgee, Lachlan and Murray valleys. The additional water will increase the potential to increase the development of water dependent industries, thereby increasing regional and state employment, and the involvement of small to medium businesses.

5.3 Environmental Benefits

Preliminary assessment indicates that the TBWTP will provide greater water availability to enhance the watering and environmental health of currently severely stressed riverine and wetland environments in the Murrumbidgee, Lachlan and Murray valleys in the Murray-Darling Basin.

5.4 Managing Adverse Environmental Impacts

Preliminary assessment indicates that the potential adverse environmental impacts of reduced flows in the Shoalhaven River below Tallowa Dam can be successfully managed. It is intended to maintain the previously SCA-assessed transparent and translucent environmental flows downstream of the Dam, and to pump water from the higher flows to supply the transfer water for the Project. The volumes which can be pumped will be confirmed by the SCA in Stage 1 of the Business Case.

6 MANAGEMENT OF BUSINESS CASE PREPARATION

6.1 Corporate Capability and Management of Business Case Preparation

E&P is a leader in providing strategic, commercial and contractual advice to many State Government departments, State owned corporations and private companies in relation to water and wastewater projects. The Water and Waste Water Capability Statement for E&P's Sydney office is provided in **Appendix 2** and this document evidences E&P's wide experience in this area.

E&P has more than 20 years experience in project delivery throughout Australia and Asia. Our leading people have been responsible for delivery of major infrastructure and water programs and projects. We have the capacity to generate innovative solutions, and optimum value for money in all phases of the program lifecycle, delivering successful outcomes for our clients.

Our success lies in our ability to understand the DPC's specific needs and implement the most appropriate delivery strategies. Our experience of hundreds of major projects means we have both an experiential and intuitive understanding of delivery imperatives. This experience includes both public and private sector clients and a broad range of project delivery models. Our understanding would be matched by strong working relationships with the DPC, and includes:

- Management by our most experienced and competent personnel;
- Clear and unambiguous documents;
- Timely support from specialists when circumstances demand;
- Managing ongoing communication and liaison between key stakeholders to optimise outcomes and broad support;
- Rigorous risk management;
- Extensive commercial and contractual expertise.

6.2 Project Profile Assessment

A Project Profile Assessment has been completed for the project. The TBWTP is identified as being High Profile, scoring 55 out of 72. This confirms that the project has a high level of potential project complexity and impact on government service delivery and stakeholders.

7 REFERENCES

Australian National University (20 May 2009); media release; *Satellite shows sorry state of Murray-Darling*

CSIRO (2008); *Water Availability in the Murray-Darling Basin*. A report to the Australian Government from the CSIRO Murray-Darling Basin Sustainable Yield Project

Department of Environment, Water, Heritage and the Arts (2009); website

Department of Planning (2008); *Sydney-Canberra Corridor Regional Strategy 2006-31*

McLeod, R; (March 2009); *Water Security for South Australia*; OzWater 09 Conference

Murray-Darling Basin Authority (2009); *Murray River System Drought Update Issue 18 April 2009*

Murray-Darling Basin Authority (2009); website

NSW Government (2006); *State Plan: A New Direction for NSW*

NSW Government (2006); *Working with Government: Guidelines for Privately Financed Projects*

NSW Treasury (2006); *Gateway Review System*

NSW Government (2008); *State Infrastructure Strategy 2008-09 to 20017-18*

Rainsaver (November 2008); *The Tallowa Pipeline Revised Report*

Rainsaver (November 2008); *The Proposed Tallowa Pipeline. Summary and FAQs of the Proposal*

Sydney Catchment Authority (2006); *Shoalhaven Water Supply Transfers and Environmental Flows August 2006 Discussion Paper*

Appendix 1 Summary of Water Transfer Project Performance

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Summary of Water Transfer Project Performance

TPC conducted daily water balance modelling of the performance of the Project for the period 1976 to 2007, the period in which Tallowa Dam has been operated. The results, summarized in **Table A1.1**, show that:

- Potentially 316 GL/year on average could have been transferred to the Sydney-Canberra Corridor Region and the Murray-Darling Basin, on an average of 233 days per year;
- Average annual spill over Tallowa Dam is (after subtracting the water transfers to the TBWTP) 561 GL, ranging from 2,955 GL to 0 GL. There would have been no spill over Tallowa dam in 4 years, although releases would have been made for environmental flows (29.27 GL) and for Shoalhaven City Council (12.44 GL) in those years;
- In at least seven years, flooding would have occurred on the Shoalhaven floodplain.

Modelling was based on water use figures published by the Sydney Catchment Authority on its website. The water balance values for 2006-07 for the Shoalhaven scheme include:

Inflow into Tallowa Dam		699.5 GL
Use of water:		
Customers	4.3 GL	
Transfers to Sydney/Illawarra	175.9 GL	
Riparian release	183 GL	
Environmental releases	29.8 GL	
Shoalhaven Council releases	12.4 GL	
Total	222.7 GL	222.7 GL
Tallowa Dam spill		492.8 GL

Unaccounted for difference is estimated as the difference between inflows, outflows, change in storage, evaporation and unaccounted water.

Table A1.1 Annual Summary of Water Transfer Project Performance

Year	Potential volume to Sydney-Canberra Corridor Region and Murray-Darling Basin (ML)	No of days of flow to Sydney-Canberra Corridor Region and Murray-Darling Basin	Remaining spill over Tallowa Dam (ML)
1976	604,000	338	2,082,674
1977	465,000	297	1,637,150
1978	390,000	308	386,204
1979	558,500	345	2,955,221
1980	159,500	75	6,332
1981	11,000	11	0
1982	225,000	190	123,621
1983	81,000	52	0
1984	399,500	312	173,648
1985	623,000	266	1,760,030
1986	397,000	299	660,084
1987	433,000	349	279,650
1988	256,500	225	160,611
1989	556,500	343	1,493,253
1990	551,000	355	2,128,279
1991	500,500	350	1,841,577
1992	406,000	294	526,745
1993	355,500	296	201,760
1994	151,500	127	81,091
1995	143,000	136	7,953
1996	309,500	264	91,957
1997	148,500	138	34,313
1998	287,500	256	149,071
1999	471,000	351	622,557
2000	322,500	269	156,800
2001	325,000	291	85,188
2002	241,500	219	150,554
2003	161,000	181	1,454
2004	91,400	74	0
2005	32,500	12	0
2006	212,500	210	41,920
2007	264,000	235	122,368
Total	10,138,900	7468	17,962,065
Average Year	**316,840**	**233**	**561,315**

Appendix 2 E&P Water and Waste Water Capability Statement

Tallowa Pipeline Company