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1994 - 2010

WATER TECHNOLOGY
23 July 2008

Mrs PENFOLD (Flinders) (16:59): As members would be aware, I have a keen interest in water and water technologies. In my endeavours to source solutions and opportunities for South Australia, I came into contact with Terry Spragg, an American proponent of 'waterbag' technology and his Australian associate, Robert Tulip. I gave a speech in parliament on 5 March 2008 giving an overview of what may be possible utilising this technology and indicated how we could help to reduce our dependence on the River Murray and improve our environment.

As a result of our contact, Mr Spragg has offered South Australia the exclusive right to be the first Australian state authorised to demonstrate his waterbag technology. More significantly, he has offered us the first right of refusal to use his waterbag technology to ship water from Tasmania to South Australia before his technology is used to transport water to any other Australian state.

Recently, a significant amount of media has been discussing the possibility of bringing water from Tasmania to the mainland. On 18 July 2008 an article was printed in *adelaidenow* entitled, 'Bid to pipe in Tasmanian water', followed by 'Debate flows over rivers of gold' on 19 July 2008 in Tasmania's newspaper, the *Mercury*.

These articles state that a MOU has been submitted by a Melbourne consortium to Hydro Tasmania, with the Tasmanian government proposing to buy water from Tasmania in order to resell it at an undisclosed rate. The consortium has offered to build and finance a pipeline from Burnie to Victoria and charge Tasmania an annual delivery fee in return for a 30-year contract.

I believe that Tasmania can better protect its interests by using waterbag technology rather than supporting an undersea fixed pipeline. Waterbag technology requires far less capital cost investment than an undersea pipeline, and the flexibility of the system allows waterbags to be taken out of service and moved to other locations within Australia or throughout the world if the water is not required.

South Australia at this time has a unique opportunity to control Spragg bag technology in Australia. Accordingly, South Australia could be in the position of offering Tasmania the flexibility of controlling shipments of water to wherever it is needed, whenever it is needed, including to other locations in Tasmania itself.

The waterbag solution has several advantages. First, the waterbags do not have to remain in one fixed position to deliver water only between two points. Secondly, it does not have to be operating at 100 per cent capacity in one location in order to pay off its fixed capital cost debt.

From one Tasmanian loading location waterbags could be used to deliver water to a variety of Australian locations simply by disconnecting the required number of waterbags at various locations along its delivery route. The bags themselves are the reservoirs, thereby preventing considerable infrastructure cost. An undersea pipeline cannot offer this physical and financial flexibility.

If South Australia could control the most economical method of transporting Tasmanian water to the mainland by working to implement waterbag technology with the Tasmanian government and Hydro Tasmania, South Australia could have some control over its water supplies.

I believe that South Australia would regret it for the rest of its history if Victoria and/or the Victorian pipeline consortium mentioned in these news stories become the first to negotiate initial rights for Tasmanian water.

South Australia will have only a subordinate right to the Melbourne consortium and Victoria's Tasmanian water interests. South Australia must begin to act for itself, and negotiate with Tasmania and Hydro Tasmania for the first rights to transport Tasmanian water to South Australia.

Spragg bag water technology is simply an economical and environmentally benign flexible fabric modular

pipeline that has been developed for moving large quantities (up to one gigalitre at a time) of water through the oceans in large waterbags connected in trains, using a patented zipper connection system that floats the fresh water on the seawater pulled along by a barge to its destination.

One of the major advantages offered by the flexibility of the Spragg bag system is the ability to suit the number of bags to the amount of water required at the time that can be expanded in increments. Waterbag capital costs do not have to be incurred all at once, as is required in the development of an undersea pipeline system or a desalination plant.

Once a waterbag delivery system of five or 10 gigalitres has proven its reliability, it will be a matter of simply adding more waterbags to the train and more trains to the system in order to incrementally increase the volume of water to be delivered to where it is needed.

The Spragg bag water delivery system can be implemented to deliver 350 gigalitres per year for a capital cost of less than $1 billion—a saving of over $1 billion compared with the Melbourne consortium's $2 billion capital cost estimate and a saving of over $7 billion to $11 billion compared with the Victorian government's estimate.

South Australia has been offered what I believe is a zero risk opportunity to test waterbag technology by implementing a waterbag demonstration voyage from Tasmania to South Australia. The first Australian state to successfully demonstrate waterbag technology will control this method of transportation.

Advantages of Spragg bag water delivery are:

- The Spragg bag has patented loading and off-loading systems that can unload a 4.5 million gallon waterbag in a matter of minutes.
- The waterbag system could begin to deliver water by 2009, depending on the volume of water required. Volumes of water to be delivered can be increased or decreased as demand and weather dictates.
- The undersea pipeline would not be able to begin to deliver water until 2010 (at the earliest).

Another advantageous way in which waterbag technology could be used to immediately help to reduce the state's dependency on the River Murray is to harness and transport the 70 gigalitres of treated effluent and 160 gigalitres of stormwater (which currently is discharged or flows into Gulf St Vincent every year) to areas where it could be used for horticulture, agriculture or beautification purposes.

Alternatively, it could be towed out to deeper, more turbulent water for dispersion. This method would be more flexible and economical that building kilometres of fixed piping systems and would help to prevent the continuing degradation of the environment off the coast of Adelaide.

The biggest challenge in maximising the use of urban stormwater is the availability of space to capture, treat and store large volumes of water. The Spragg bag system could be used to collect and transport stormwater to regional areas where it could be stored in the bags to be treated, if necessary, before being utilised.

The discharge of stormwater and recycled water over the years has resulted in an increasing loss of seagrass in the gulf. The discharge clouds the water and the nutrient contamination levels have contributed to the massive damage that has occurred. Stormwater and/or recycled water could be transported in the waterbags and pumped across sand dunes to the Coorong and Lower Lakes to help offset dropping water levels and rising salinity.

Mr Spragg is not requesting any payment from South Australia for the first right to use his technology in Australia and to control the use of a fabric water pipeline from Tasmania. He is asking for support for a demonstration of his technology and has presented South Australia with a sponsorship marketing plan that should result in zero financial risk to South Australia in order to implement his waterbag demonstration voyage

plan from Tasmania to South Australia.

South Australia is in a dire water supply situation, and it is predicted by some experts that it will get even worse. I therefore ask that the government support a trial of the Spragg bag technology as possibly part of the solution to our water crisis and as a necessary step before we can begin to rehabilitate the marine environment off Adelaide.

SPRAGG BAG WATERBAG
5th March 2008

Mrs PENFOLD (Flinders) (16:19): Mr Terry Spragg, an American inventor and proponent of waterbag technology, and his Australian associate Mr Robert Tulip, with some input from me, have recently put a submission, entitled 'Spragg Bag Water Transportation and Storage Technology for Climate Adaption', to the Garnaut climate review. Today I draw the attention of the house to this submission and urge those interested to seek more information on www.waterbag.com. A YouTube video of Terry Spragg walking on water can also be accessed at http://www.youtube.com/watch?v=4TEJp6UZaDI

The submission, 'Flexible water supplies for when and where you need them', provides the following information:

The Spragg Bag waterbag is a new technology developed in the USA for towing large volumes of freshwater through the ocean in trains of connected fabric bags. A patented zipper bag connection technology enables robust seaworthy operation for water shipments of large size and economic fuel efficiency. Tests show each trip can transport up to one gigalitre of drinking water in 60 connected waterbags with each bag holding 17 megalitres.

Waterbags will be a major contribution to Australia's adaption to climate change. They provide a flexible and modular technology to ensure water security for consumers in times of erratic or changing rainfall. Waterbags are a low-energy method to secure urban water supply. There are potential future waterbag uses for carbon sequestration and climate change mitigation.

Waterbags are a better value, faster and more greenhouse-friendly method for expanding urban water supplies than desalination, dams and pipelines. Waterbags have significantly lower capital and operating costs, greater ease of implementation, minimal environmental impacts and much lower energy use than other options. Waterbags will be a new commercial water supply industry that will address drought contingency risks, create jobs, revenues and economic growth, and be good for the environment.

Wastewater treatment and transport for factories, stormwater and sewerage outfalls is a potential major future application with strong environmental benefits. Waterbags float in the ocean because freshwater floats on salt water. This principle has numerous potential innovative applications relating to climate change adaption and mitigation. Waterbag technology will have broad positive environmental impacts, strongly supporting Australia's adaption to a likely warmer and drier climate.

Because of the flexibility of waterbag technology, the waste water system can be shut down and moved elsewhere if water levels at a selected waterbag loading source fall below designated environmental flows. Waste water treatment applications, climate adaption and mitigation potential provide further environmental benefits. An example of potential waste water treatment is in response to the problems identified by the Adelaide Coastal Waters Study. Technical reports have identified a loss of more than 5,000 hectares of seagrass mainly caused by poor water quality, especially high nutrient levels in the near shore waters.

These losses are due to the discharge of treated waste water from industry and metropolitan waste water treatment plants. High levels of suspended solids in stormwater flows are also implicated. Waterbag transport and storage could make an innovative and cost effective contribution to the management of these liquid wastes. An article by Ian Edmonds, Northern River Water for Australian Cities, published in the September 2007 edition of Water, the Journal of Australian Water Association, discusses the feasibility of long distance waterbag transport. The article cites The Spragg Bag as a precedent and concludes:

The East Australian Current that flows 2,000 kilometres from the northern tropics to Sydney carries with it the outflow of the northern rivers. Enclosing only a small percentage of this river water in large membrane containers and allowing the filled containers to float with the current provides an almost free method of delivering drinking water to the major east coast cities. Preliminary cost estimates for the supply of 120 ML per day to the Gold Coast indicate this method of water supply may be 30 times less expensive to implement than an equivalent supply by desalination plant and that the method may emit 60 times less greenhouse gas. These figures suggest that the proposal would be much less expensive than a pipeline from the Burdekin River to Brisbane.

Droughts are cyclical and rain can return for many years. Once built, desalination plants continue to depreciate and the capital costs continue to require payment whether or not the plant is in operation.

In 1992, the city of Santa Barbara, California spent $35 million to build a 3.2Â MGD desalination plant. The plant ran for one month. The rains came and the reservoirs filled, and the plant never operated again and later was sold for scrap. The flexibility offered by waterbag technology can avoid these technical and financial problems. A desalination plant costing $1.5Â billion for Adelaide is highly risky when other options, including waterbags, could cover drought situations at much less cost to the taxpayer who needs other infrastructure and better health services much more.

The Spragg Bag waterbag technology will enable the commercial sale of fresh water from places of abundance; supply large volumes of competitively priced new water for municipal and industrial use in all coastal areas of Australia; and reduce the need for water restrictions enabling increased economic activity (for example, tourist, housing, watering of urban parks, industrial use high value agriculture in destination centres). Improved efficiency and market orientation in the Australian water industry provide an efficient waste water management option in suitable locations of potentially major contributions to CO2 emission reduction, climate adaption and climate change mitigation.

An extensive economic analysis of specific waterbag proposals has been commissioned by Spragg & Associates, and an initial Australian desk study was prepared for indicative water supply over distances of 900 kilometres and 2,150 kilometres. This analysis indicates that waterbag technology can supply commercially competitive water for municipal and industrial purposes to mainland Australian cities and that waterbag technology has the potential to create a major new water transport industry for Australia. Tasmania is ideally placed to take a global lead in the introduction of waterbag technology in view of Australia's ongoing water shortages and strong technical, physical and political capacity to introduce waterbag technology quickly.

Experience with how to manage and sell bulk resources through the mining industry provides a platform for the introduction of waterbags. Waterbags will prove highly competitive and energy efficient against other technologies such as desalination, canals, pipelines, dams, ocean tankers, and recycling and will act as a useful addition to the overall Australian water supply system. Waterbags will prove suited to a wide range of new and innovative uses. I have suggested other ideas that could make the waterbag technology take off as a way to help clean up our environment and provide more water. For example, waterbags can be used to collect stormwater, factory waste water, grey water and sewerage for treatment, clean disposal and reuse.

These approaches could provide new sources of water for a range of purposes, from irrigation to human consumption. These sources would use water that is already available and causing environmental issues. Even the saline water from desalination plants, where these plants are still economical, could be collected in waterbags and towed out to sea for release in deeper, more turbulent waters to dissipate. The Spragg & Associates' patented zipper technology can be used for efficient and environmentally safe deep sea waste disposal. Waterbags are an ideal strategy for climate adaption in the water sector.

They can be put in place quickly to meet demand and drought contingency; are entirely modular and can be scaled up from a small initial operation; can be relocated and used elsewhere; can be made on demand without high upfront capital costs; can act as their own offshore reservoir at source or destination; require much less energy than desalination per volume of water produced and delivered; so might be eligible for carbon offset financing; do not require large land purchases; reduce the need for other expensive water supply solutions; and may in the future be powered by renewable wave, solar and wind energy. If water supplies at one source are less than the designated level earmarked for environmental flows, it is simply a matter of disconnecting the offshore portion of the water delivery system and moving it to a different water source location. The water bags are easily

moved to any offshore loading location. Water technology allows for an open-ended perpetual agreement with multiple water sources, depending on water availability and transport price from any potential water sources.