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Our Ref: DOC12/32888

Ms Cathryn Cummins
Principal Council Officer
Legislative Council
Parliament House
Macquarie Street
SYDNEY NSW 2000

14 September 2012

Dear Ms Cummins,

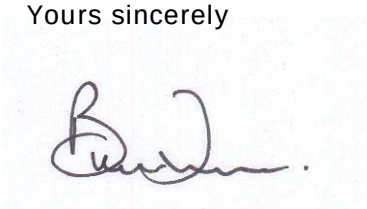
Thank you for your letter dated 24 August 2012 seeking confirmation and amendments to the transcript of evidence from the Inquiry into the Adequacy of Water Storages in NSW as well as providing supplementary questions from members.

I would like to thank the Standing Committee on the State Development for providing State Water the opportunity to respond to the Inquiry into the Adequacy of Water Storages in NSW.

Please find attached proposed amendments to the transcript and responses to the supplementary questions.

If you have any additional questions or require further clarification, please do not hesitate to contact Dr. Amit Chanan, Executive Manager Operations State Water on (02) 8245 2036.

Yours sincerely



Brett Tucker
Chief Executive Officer

STANDING COMMITTEE ON STATE DEVELOPMENT – 20 AUGUST 2012

STATE WATER CORPORATION

RESPONSE:

What is the cost benefit ratio of the CARM project?

Preliminary cost estimates place the cost of rolling CARM out to the rest of NSW at $40 million. This cost assumes there is already a telemetered metering solution in place that the CARM technology can take advantage of as real time management is critical to identifying savings.

Preliminary modelling indicates at least 100GL of operational savings water would be made available through this rollout excluding water already identified in the Murrumbidgee. Based on these estimates, and an assumed value of $1,000/ML, the project is expected to have a benefit cost ratio up to 2.5.

Will there be any water storages at the end of stage one that will not comply with one in 200,000 years? Are any that do not comply with the one in 200,000 before you move to the one in a million?

After the Dams Safety Stage 1 upgrade program is completed on the seven high risk dams in State Water's portfolio, all storages will pass a 1 in 200,000 year annual exceedence probability (AEP) flood except for the following dams:

- Wyangala dam (1 in 122,000)
- Burrendong dam (1 in 147,000)

Both these dams are subject to Stage 1 Dams Safety Upgrades (see table below). The potential need for further upgrades will be assessed by way of a risk-based and phased approach to future upgrade works as part of the Portfolio Risk Assessment process due to be completed in October 2012.

Following the completion of the Portfolio Risk Assessment update process in 2012, State Water will inform the NSW Dams Safety Committee and of its plans for the Stage 2 of the Dams Safety Upgrade Program.

Consideration of Dams Safety Upgrade expenditure (capital works and/or future investigations into risks identified) will be incorporated as appropriate into State Water's Total Asset Management Plan and the pricing submission to the ACCC for the next determination period.

With regard to CARM, are there identified savings that will go to each of those rivers that are contributing to each of the water targets for the Snowy River?

The entire Water for Rivers funded State Water project in the Murrumbidgee is costing $65 million to identify 33GL in savings. This program includes CARM technology, new metering, and a number of new or upgraded regulating structures, along with improved operations for the Yanco Creek.

These savings are going to the Snowy. It is State Water's understanding that as at June 2012, Water for Rivers had met its requirement of 282GL combined for the Snowy and Murray Rivers.

This program is also identifying another 200GL in operational savings which should be able to assist the Murrumbidgee in meeting downstream sustainable diversion limit (SDL) requirements.

Can you provide the details for the infrastructure improvements and enhancements for the seven projects in the first phase?

SWC top seven high risk dams	Likelihood of Dam Overtopping		Costs ($M)	
	Before Stage 1	Post Stage 1	Stage 1	Comment
Blowering	1:210,000	1:580,000	38.6	Stage 1 complete
Burrendong	1:72,000	1:147,000	35.5	Stage 1 partially complete
Chaffey Stage 1 (62GL) Chaffey Aug (100GL)	1:96,000	(62GL) 1:450,000 (100GL) >2,400,000	(62GL) 13.6 (100GL) 43.34	Stage 1 complete Stage 2 Augmentation in design
Copeton	1:16,700	1:403,000	55.9	Stage 1 in construction
Keepit WP1 + WP2	1:30,000	WP1 (1:47,000) + WP2 [to PMF]	110.5	Work Package 1 (WP1) complete WP2 detailed design to complete end 2012
Split Rock	1:116,000	>1:620,000	8.3	Stage 1 complete
Wyangala	1:34,000	1:122,000	57.8	Stage 1 partially complete

Dams Safety Upgrade descriptions

1. Blowering Dam

   Stage 1 Construction complete

   a. New 2m parapet wall on the dam crest
   b. Raise spillway walls to contain higher discharges
   c. Upgraded dam now passes the Probable Maximum Design Flood (PMPDF)

2. Burrendong Dam

   Stage 1 Construction partially complete and still ongoing

   a. Main embankment crest raising to maximum height of 1.8m (with or without parapet) – Stage 1a construction complete
   b. Stage 2a spillway upgrade - detailed design 70% complete
      i. Raise spillway walls to contain sub PMF outflow and spillway strengthening
      ii. Raise the spillway gate hoist bridge in accordance to crest – Current Stage 1b detailed design in progress
   c. Upgraded dam will pass the Probable Maximum Design Flood (PMPDF)

3. Chaffey Dam – Phase 1 upgrade + Augmentation
   a. Phase 1 (complete) – construction of 35 m auxiliary fuse plug spillway (1:10,000 AEP trigger)
   b. Future Phase 2 Augmentation from 62GL to 100GL currently in detailed concept design stage:
      i. Upgrade dam to comply with ANCOLD and DSC safety standards
      ii. Reduce risk by increasing spillway capacity to pass Probable Maximum Flood (PMF)
      iii. Increase storage capacity to 100GL by 6.5 m FSL raising
   c. Upgraded dam to be fully compliant and will pass the Probable Maximum Flood (PMF)

4. Copeton Dam

   Stage 1 Construction in progress

   a. 250m wide Fuse Plug (FP) auxiliary spillway at Diamond Bay (DB) – construction in progress
   b. Relocation of Copeton Waters State Park (CWSP) recreational facilities - completed
   c. Rerouting the existing Copeton Dam main road
   d. Upgraded dam will pass the Probable Maximum Design Flood (PMPDF)

5. Keepit Dam Work Packages 1 & 2

   Work Package 1 (construction complete)

   a. Earthen auxilliary fuse plug spillway at the right abutment of Keepit: excavation and construction plus construction of the coffer dam
   b. Auxiliary fuse plug spillway through the centre of the subsidiary dam: excavation and construction plus construction and removal of the coffer dam and other waste material
   c. Three new saddle dams, at the boat ramp, sailing club and caravan park

   Work Package 2 currently in detailed design (due to complete end 2012).

   d. Construction planned to start early 2014.
   e. Upgraded dam to be fully compliant and will pass the Probable Maximum Flood (PMF)

6. Split Rock Dam

   Stage 1 Construction complete

   a. New parapet wall on embankment
   b. Upgraded dam now passes the Probable Maximum Design Flood (PMPDF)

7. Wyangala Dam

   Stage 1 construction partially complete

   a. Spillway Chute Wall Raising - complete
   b. Radial Gate Raising & Locking System – design complete
   c. Bypass Road and Bridge – concept and detailed design complete
   d. Parapet Wall Crest Raising – design in progress – due to complete by end of 2012
   e. Upgraded dam will pass the Probable Maximum Design Flood (PMPDF)

<u>When was the Australian Early Warning Network put in place for Blowering Dam? What is the public response rate?</u>

State Water's Early Warning Network has been tested and categories have been set for all of State Water's dams. Although these categories may expand in the future, they are currently defined as high regulated releases, flood notifications and dam safety alerts.

At this stage, only the Glennies Creek Dam early warning system is operational. Early warning systems at other State Water's Dams are functional, but not yet operational, and are being reviewed to ensure best practice.

The enrolment rate for the Glennies Creek Dam Early Warning Network is provided below:

Glennies Creek Dam Safety Alert	Hunter = 155
Glennies Creek Flood Notification	Hunter = 5
Glennies Creek High Regulated Release	Hunter = 5

Enrolments for the Blowering Dam Early Warning Network are currently:

Blowering Dam Safety Alert	Murrumbidgee = 70
Blowering Flood Notification	Murrumbidgee = 11
Blowering High Regulated Release	Murrumbidgee = 7

State Water is finalising the later stages of the project to bring the Blowering Dam Early Warning Network online. This final stage of the project will ensure that State Water continues to provide accurate, relevant and factual information to stakeholders and is reflective of best practice.

RESPONSE TO SUPPLEMENTARY QUESTIONS

1. One of the terms of reference for the Committee asks us to consider the models used for determining water requirements for agricultural, urban, industrial and environmental needs.
    a. Please explain how State Water predicts the expected water supply levels that will be available for each of these sectors?
    b. What factors do you consider when modelling available water?

For the purposes of planning, State Water forecasts future water demand for both short (12-24 months) and longer term (greater than 24 months) planning horizons.

For short term forecasts, State Water considers past customer behaviours by analysing historical water usage for each valley and the associated water availability. Short term customer demand (water requirements) is estimated by extrapolating current water availability from monthly available water determinations released by the NSW Office of Water. This information is then compared to State Water's estimate of water allocation at anticipated crop planting and traditional peak irrigation dates, as well as the likely demands of non-irrigation customers.

Further, State Water investigates the status of on-farm and industry storages, estimates water use out of customers' storages, and identifies when customers are likely to initiate the next season and associated water usage via targeted communications with key customers. This includes attending quarterly valley-based Customer Service Committee meetings, water user group meetings, and one-on-one discussions with the largest users within a valley.

State Water also reviews annual Environmental Water Plans produced by the Office of Environment & Heritage, as well as the Commonwealth Environmental Water Holder. These plans outline Environmental Water Holders' water requirements for the next 12 months. Finally, consideration is also given to Bureau of Meteorology's three-month climatic outlook and how this may impact future usage

Predicting water demand for longer than 24 months is a challenging process and estimates are considered as indicative only. This estimate is calculated by looking at three types of data: long term weather forecasts, IQQM Modelling, and historical water usage data for the last 20 years.

Long term weather forecasts are used to create a model which enables water delivery to create scenarios on future water events that may take place. These long-term weather forecasts also highlight potential La Nina and El Nino patterns which can have significant impacts on future weather conditions.

2. What are the main difficulties faced by State Water in storing, diverting and transporting water in rural NSW?

There are a number of issues in storing, diverting and transporting water in rural NSW. The most significant bulk water issues include the cost of meeting dam safety requirements, long term planning for bulk water and the provision of fish passages.

Long Term Planning for Bulk Water
Given the recent prolonged drought, water security and the adequacy of storages in NSW has been identified as an issue for governments as well as State Water's customers and stakeholders. As part of its long term asset planning process, State Water is working with the Lower Hunter Strategy Working Group to assess the feasibility of Lostock Dam as a future water supply option for Hunter Water. State Water is also investigating supply security options in the Fish River Water Supply.

State Water has identified a number of potential Sustainable Diversion Limits (SDL) offset projects. Given the expected requirements of the proposed Basin Plan, the potential for SDL offsets are expected to be an ongoing management issue for State Water.

Fishway Management
S.218 of the Fisheries Management Act 1994 requires the provision of fish passage when waterway infrastructure is constructed, altered or modified.

State Water is undertaking safety upgrade works at a number of major storages. Given the significant cost of placing fish passages on major structures, fishway offsets under S.218 of the *Fisheries Management Act 1994* are being investigated at 13 assets downstream of these major dams with the aim of achieving a greater ecological outcome at a significantly reduced capital expenditure.

3. A number of submissions to the inquiry discussed the conflict between the quantity of stored water and the quality of stored water.
    a. Can you explain how you ensure the reliable quality of stored water, especially over longer periods of time?
    b. What storage management practices do you implement to maximise the quantity of water?

As State Water is a supplier of bulk water, raw water is supplied from the majority of State Water dams.

State Water supplies treated water from the Fish River Water Supply scheme. Water in the Fish River scheme is sourced from either Oberon Dam or Duckmaloi Weir. Treated water supplied from the Fish River scheme meets the Australian Drinking Water Guidelines.

State Water Strategic Water Quality Monitoring Program (SWQMP) incorporates State Water monitoring requirements derived from the following drivers:

- State Water Operating Licence
- Works Approvals
- *Dam Safety Act 1978*
- Australian Drinking Water Guidelines ANZECC/ARMCANZ (2000)

The program is designed to incorporate areas of overlap between the drivers and seeks to maximise efficiency.

In addition, State Water's Environmental Management Plan (EMP) 2011 – 2016 outlines State Water's overarching framework for environmental management and directs the development, implementation, monitoring and review of State Water's environmental objectives.

State Water's EMP and targets are developed around the following four objectives:

1. Responsible land and asset management
2. Monitor water quality and manage operational impacts on aquatic habitat
3. Manage resources efficiently to minimise waste
4. Promote an environmentally responsible culture with all stakeholders

Given that dams and other in-stream structures have the potential to alter the natural characteristics of aquatic ecosystems, the second objective of State Water's EMP - *monitor water quality and manage operational impacts on aquatic habitat* - involves management and mitigations of riverbank and bed erosion, water quality issues associated with storage and release (including mitigation of thermal impacts), barriers to fish passage and algal blooms.

State Water has adopted the recommendations of the current algal programs and monitors algal levels in State Water storages according to the regional algal contingency program.

State Water takes all reasonably practical steps to conserve water and minimise losses from its operations, within the constraints of the Operating Licence and the Water Sharing Plans. State Water has significant control over operational surpluses via the scheduling of releases. This activity is controlled by water delivery staff using State Water's specialised decision support systems.

4. Some submissions have highlighted that the growth of the mining sector will place increased demand on the availability of water in NSW. What strategies is State Water implementing to manage the growing demand for water from the mining sector?

Water requirements for mining activities have historically been met through existing resources acquired in the market for water.