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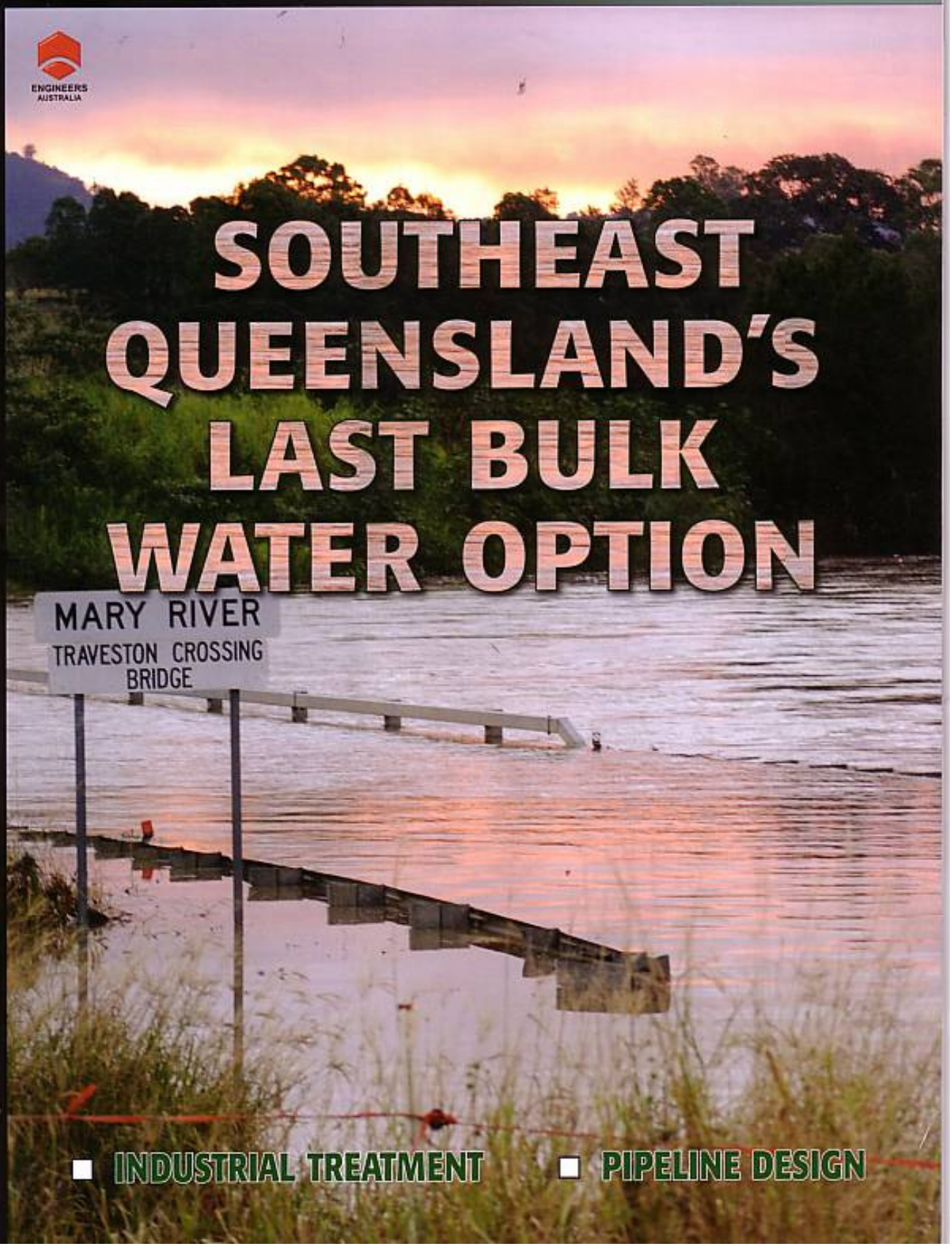

SOUTHEAST QUEENSLAND'S LAST BULK WATER OPTION

- INDUSTRIAL TREATMENT
- PIPELINE DESIGN

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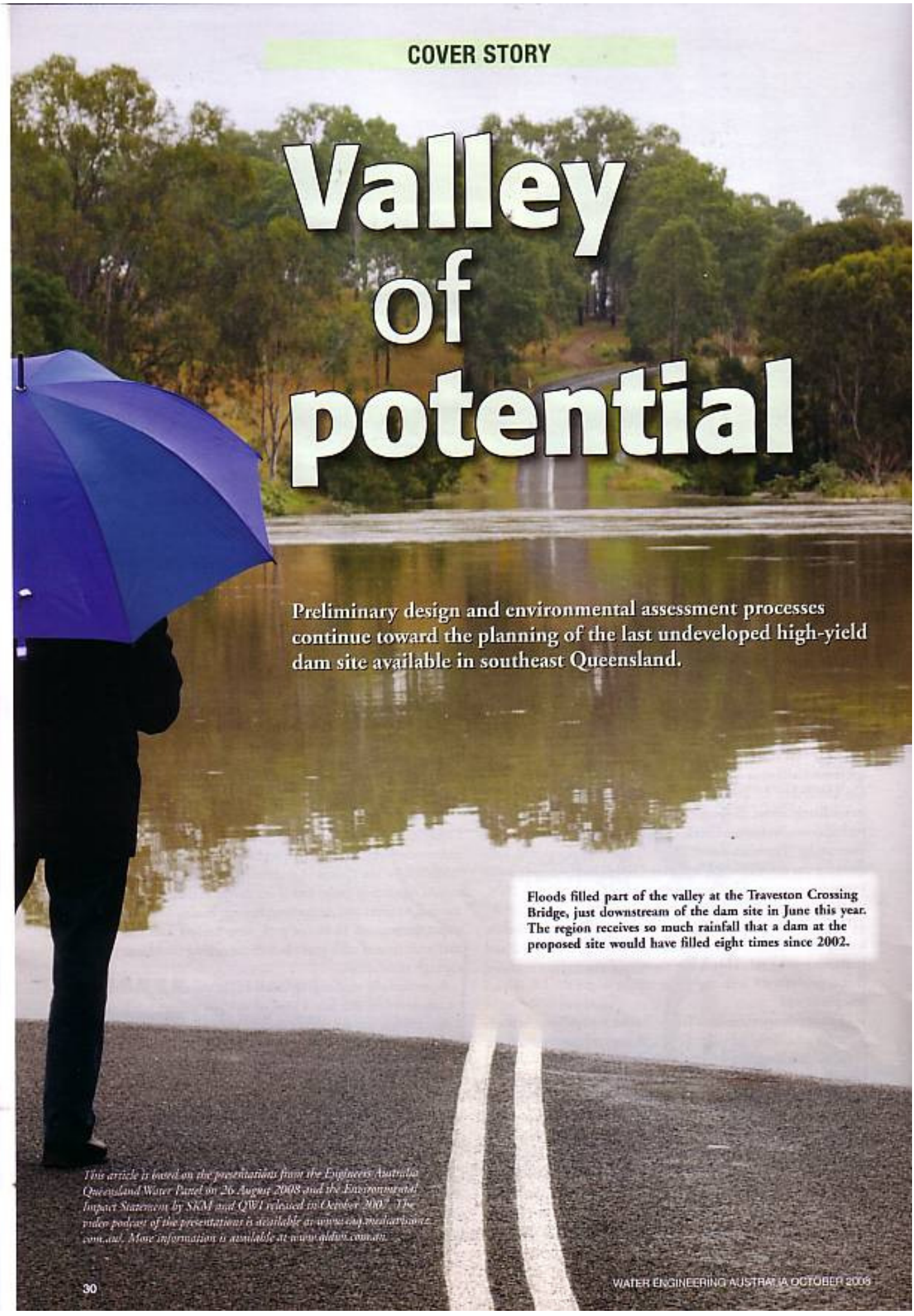
$8.80 INCL. GST

Valley of potential

Preliminary design and environmental assessment processes continue toward the planning of the last undeveloped high-yield dam site available in southeast Queensland.



Floods filled part of the valley at the Traveston Crossing Bridge, just downstream of the dam site in June this year. The region receives so much rainfall that a dam at the proposed site would have filled eight times since 2002.

This article is based on the presentations from the Engineers Australia Queensland Water Panel on 26 August 2008 and the Environmental Impact Statement by SKM and QWI released in October 2007. The video podcast of the presentations is available at www.eaj.mediatrainer.com.au/. More information is available at www.aldun.com.au.

The proposed site for the Traveston Crossing Dam is located on the Mary River approximately 207km upstream from the river mouth and 27km upstream of the town of Gympie, which is settled approximately 160km north of Brisbane.

Queensland Water Infrastructure (QWI), established by the Queensland government to progress the feasibility and potential design and construction of several major water infrastructure projects in southeast Queensland, is currently progressing through the feasibility and approval stages for Stage One of Traveston Crossing Dam development.

Quite a lot of work has already gone into the preliminary stages of the project. On the research side, a team of qualified experts that included around 50 doctors of their profession, worked on aspects of the proposed Traveston Crossing Dam and its potential impacts. QWI chief executive officer Graeme Newton said that in addition to the tertiary research, many hundreds of experienced technical advisors have participated in the process to date.

"As an example, the top 11 engineers working on the project have over 400 years experience on 350 dams in 25 different countries," Newton said.

SKM were contracted as the lead consultants for the Environmental Impact Statement, with study team partner assistance from seven universities and 26 engineering, environmental and economic consulting companies (see table on page 34).

Brisbane-based frc environmental were responsible for assessing the likelihood of the dam impacting matters of National Environmental Significance for downstream waters and Fraser Island World Heritage Area.

The Queensland Coordinator General is currently assessing the Environmental Impact Statement and, if he sees fit to approve the development, a report will be passed to the federal government to make the final assessment. If approval is received, the project has a scheduled completion date of December 2011.

At a time of high and continued population and economic growth through the region, the Environmental Impact Statement said the Traveston Crossing Dam site has been identified as best meeting the need for new, high yield surface water storage in the northern sector of the southeast Queensland water grid.

MWH made population and demand projections last year to consider the future needs of southeast Queensland. Their report stated that the Queensland government is currently faced with the situation where demand for reticulated water in southeast Queensland is estimated at 440GL/a under prudent take conditions. In accordance with the medium series population projections, at least 140GL/a of additional prudent take will be required by 2026 and 330GL/a by 2051. A high series population projection/high water savings scenario would require an additional prudent take of 210GL/a by 2026 and 490GL/a by 2051.

MWH estimated that alternative measures including water harvesting and recycling would be sufficient to meet the region's demand for water to the year 2026. However, Marden Jacobs

performed an economic review on all the alternatives and identified the dam as the most cost effective and beneficial water source in southeast Queensland.

The Environmental Impact Statement said: "If the project does not proceed, there would be an appreciable shortfall in water available to meet estimated demand. If proposed initiatives targeting water savings were to fail to achieve their targets, there would be very significant shortfalls in the short term."

QWI CEO Newton recently told the Engineers Australia Queensland Division Water Panel that the dam represents one component of the overall water strategy to secure a safe and reliable water supply for southeast Queensland, with the potential to supply up to 27% of the additional water supply required by 2015.

"Obviously, a range of alternatives were considered and these all form part of the Queensland government strategies to date anyway," Newton said. These alternatives include water demand management; water harvesting; recycling; rainwater tanks; alternative water supply options, and desalination.

The total capacity of the first stage of the proposed dam would be 153GL, with an annual extraction of approximately 70GL. The expected flooded area would be 3039ha of the Mary Valley and would inundate a section of the Mary River for 36.5km upstream of the dam wall. The expected 100% capacity water depth at the dam wall would be at 24m, with average depth in the river channel at 12m and average depth across the site around 5m.

Lee Benson of Ecology Management told the Engineers Australia Queensland Water Panel that even though the size of the dam is relatively small when compared to other dams in Australia, it is in a wet catchment. The Mary River exhibits the largest predevelopment flow in the region and the proposed dam would receive waters from roughly six major tributaries.

Some areas within the dam containing catchment collect very high rainfall around 1600mm/a and 2000mm/a. "The rainfall in the Traveston area is very good, so with respect to hydrology, the dam works very well," Benson said.

Environmental Impact Assessment investigations by SKM indicate the dam would be full or near full more than 80% of the time and would have lower evaporation rates than both Wivenhoe Dam and Borumba Dam.

Yet, the dam would only catch water from 22% of the Mary River catchment and Benson calculated that over 90% of

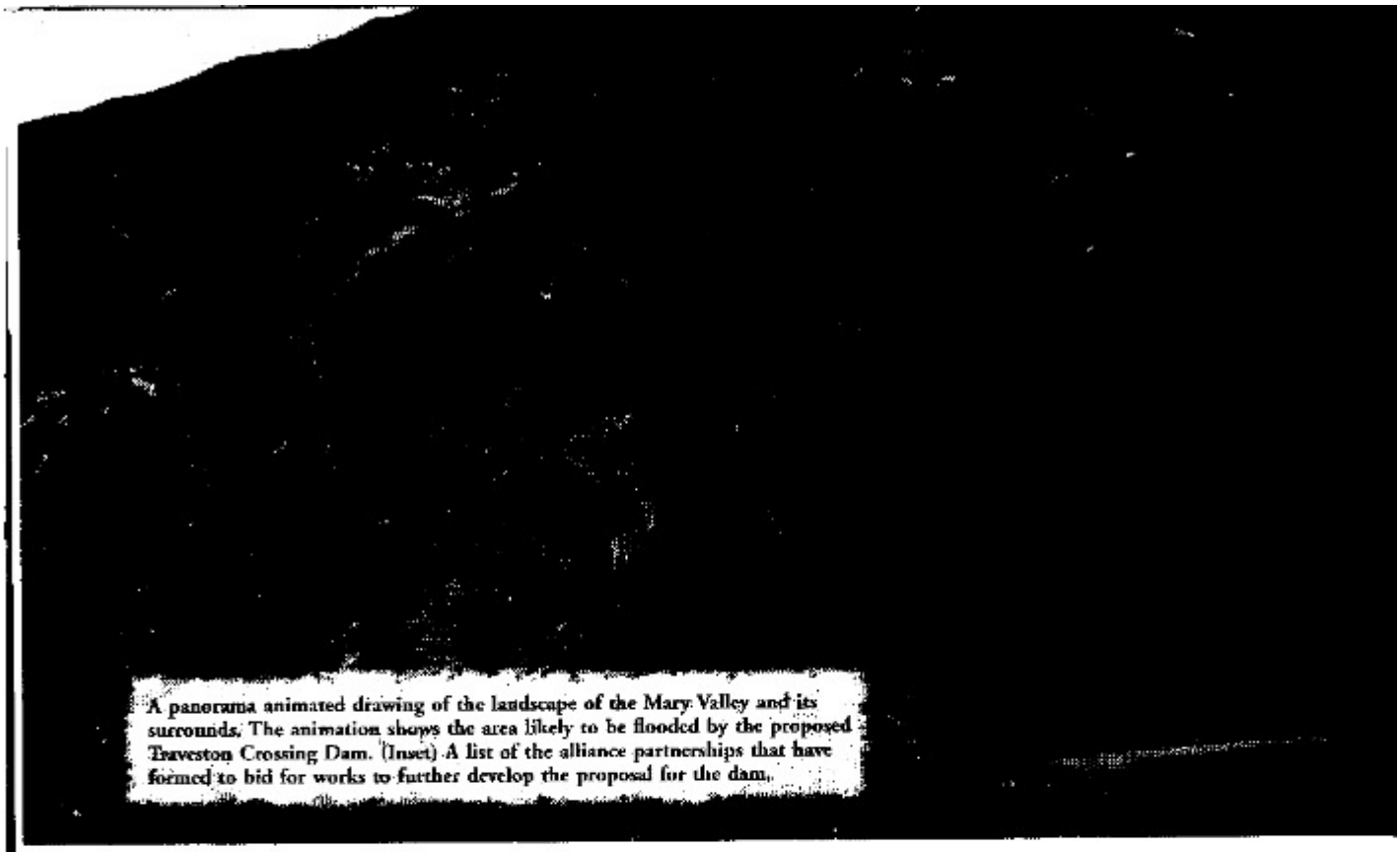
Table 1. University study partners

University study partners
Griffith University
James Cook University
Monash University
Queensland University of Technology
University of NSW Global
University of Queensland
University of Sunshine Coast

Representatives of major contractors visit the site of the proposed Traveston Crossing Dam.

Table 2. Environmental Impact Statement study partners.

Study Partners	
ACIL Tasman	Hydro Tasmania Consulting
Allens Arthur Robinson	Hydrobiology
ARUP	KBR
Biodiversity Assessment and Management	Marsden Jacob Associates
BMT WBM	McCullough Robertson Lawyers
Connell Wagner	MWH
CSIRO	PB
D3 Environmental	SMEC
DBM Consultants	SunWater
EarthTech	Synergies Economic Consulting
Ecotone Environmental Services	The Allen Consulting Group
FRC Environmental	Three Plus
Golder Associates	URS



A panorama animated drawing of the landscape of the Mary Valley and its surrounds. The animation shows the area likely to be flooded by the proposed Traveston Crossing Dam. (Inset) A list of the alliance partnerships that have formed to bid for works to further develop the proposal for the dam.

the mean annual stream flow and 86% of the median would still reach the mouth after the Traveston Crossing Dam was in place.

Benson examined the storage capacity as the percentage of the mean annual flow and found the extraction yield of Traveston Crossing Dam at 70GL/a is a very small proportion of that flow. He noted: "The mean annual end of system flow is about 2300GL/a, and as a median it's over 1600GL/a. That, in itself, is an interesting figure because the ratio of the median to the mean in the Mary River is quite high, meaning that the flows are relatively regular for an Australian river."

The preliminary design reports outline that a Roller Compacted Concrete (RCC) dam would be constructed across the valley floor with a wall height of up to 59m above its foundations, an earth embankment and saddle dam structure on the left abutment with a conventional mass and reinforced concrete spillway on the right abutment. Flood gates, multi-level water offtakes, a fishway and turtle ramp are also incorporated into the design.

> At a time of high growth, the site has been identified as best meeting the need for high-yield surface water storage.

QWJ CEO Newton said it was likely the Traveston Crossing project would be built as an RCC dam. He explained that RCC is a type of concrete that is much drier than normal concretes, and is used in building concrete dams to allow for a quicker construction process. Each RCC section is built in successive horizontal layers. After each layer is placed, it is able to support the equipment required to place the next layer.

"With over 365 RCC dams now in operation around the world, and many more under construction, RCC is becoming the method of choice, particularly in areas that experience high rainfall. This methodology provides a higher degree of certainty in safeguarding the site from major stream flows during construction," Newton said.

SMEC was given the brief to undertake a review of engineering processes associated with the project and the task was completed by Phil Cummins, a past chairman of the Australian National Committee On Large Dams, and current chairman of the International Commission of Large Dams (ICOLD) committee on operations and maintenance rehabilitation of large dams, and Tim Hanson, general manager on civil infrastructure.

Cummins told the Engineers Australia Queensland Division Water Panel that although there has been a lot of commentary outside the engineering profession about the dam being situated on a site with permeable alluvial soils, he was yet to see a dam site that didn't have permeable alluvial soils.

"Okay, the depth you see here is greater than what is usual, but the embankment dam design has been as much developed in Australia as anywhere else in the world, and was an initial response to dams on soft leaking foundation," Cummins said.

He explained that there were many treatment methods commonly available including cutting off the alluvial with some type of concrete curtain, like sheet pilling. The method adopted in the preliminary design to remove all the alluvial soil is another way of solving the problem, but Cummins said this was a conservative option.

With many years of large dam construction and management experience Cummins said many of the models used in the preliminary design have been based on conservative estimates. For

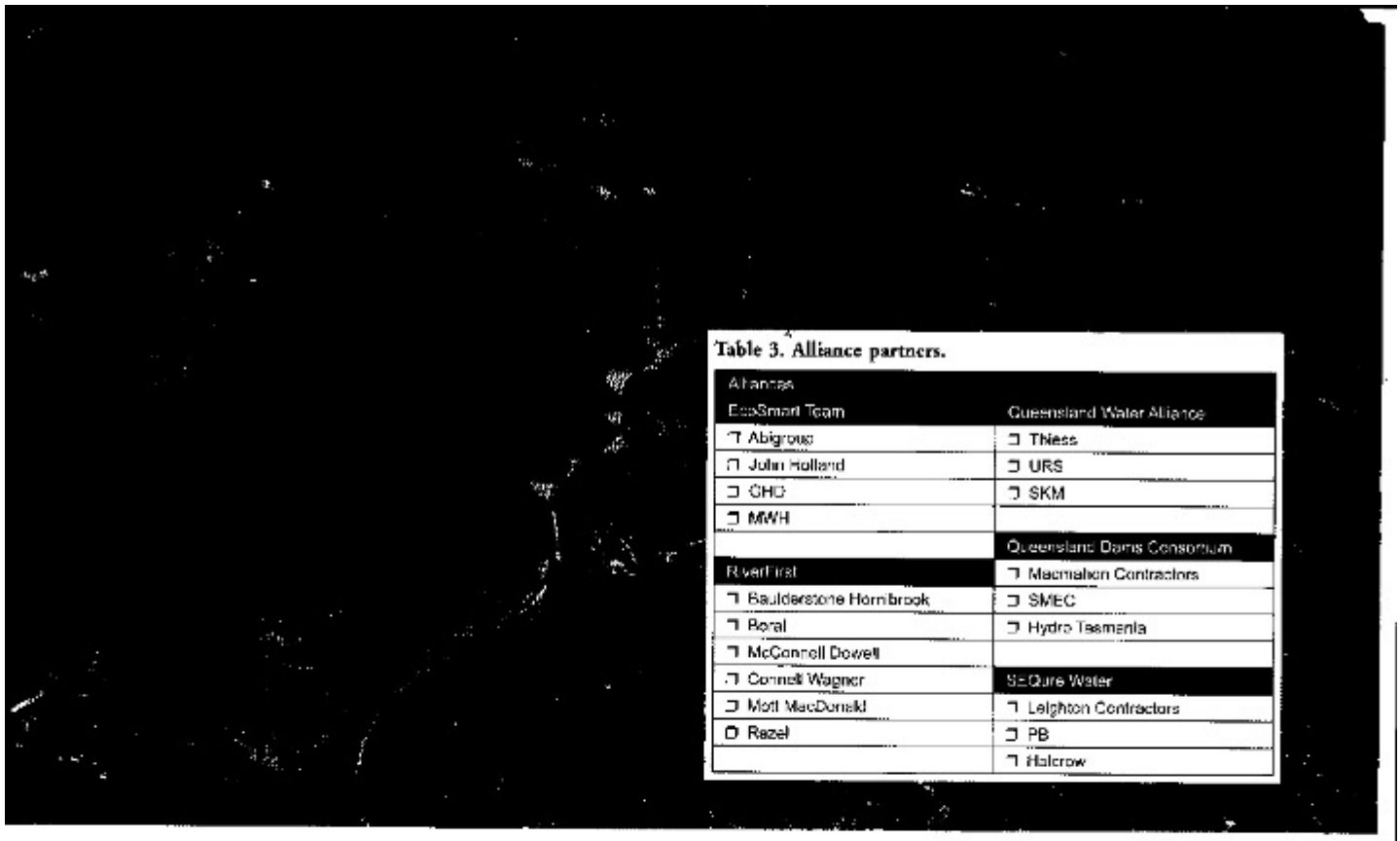


Table 3. Alliance partners.

Alliances	
EcoSmart Team	Queensland Water Alliance
Abigroup	Thiess
John Holland	URS
CHC	SKM
MWH	
	Queensland Dams Consortium
RiverFirst	Macmahon Contractors
Baulderstone Hornibrook	SMEC
Bovis	Hydro Tasmania
McConnell Dowell	
Connell Wagner	SEQure Water
Mott MacDonald	Leighton Contractors
Razel	PB
	Halcrow

example, he thought estimated losses to evaporation and leakage would be less than expected because total loss "depends on how you operate the dam".

Five alliances have formed in anticipation of the procurement and construction phases of the proposed dam. These alliances are the EcoSmart Team; RiverFirst; Queensland Water Alliance; Queensland Dams Consortium and SEQure Water (see table above for alliance make-up).

A decision on the project is expected by the Queensland Coordinator General in the coming months. ●