

JOURNAL

FOR IRRIGATION PROFESSIONALS

Trade qualification
establishes career path
for irrigation

Feature:
Irrigation design
and installation



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ON THE FRONT COVER:

In a significant development for our industry, in August it was announced that there now is a trade qualification in irrigation, called Certificate III in Irrigation Technology.



WELCOME



CHAIRMAN'S MESSAGE

It's that time of year again when our industry organisation calls for nominations for director positions for the national Board. This call is made each year before the AGM, in line with the constitutional requirement that director positions be rotated as a means of introducing "new blood" and ensuring new thinking and fresh ideas at a strategic level.

Directors Peter Brueck, Bruce Scarterfield, Momir Vranes and Simon Treptow as well as myself are retiring after having served two years and, on this occasion, all are eligible for re-nomination. I believe other members will also be nominating, which is a good sign that Irrigation Australia is playing an important role in the development of the industry in Australia. In the current environment of dry conditions across most of the nation and the challenges associated with this, the election, to be held in October, will be an important one in determining who will guide Irrigation Australia into the future.

I sincerely thank all of our past and current directors, who have contributed their time, knowledge and experience to guiding the association and building on its successes. Your efforts generally go unheralded but are essential to providing the required direction and governance for our industry association.

For anyone considering nominating, the role of the Irrigation Australia Board is an interesting and challenging one where we focus on providing strategic direction for our CEO and his team. The Board works best when it is comprised of

people from a diverse range of backgrounds with each contributing based on their knowledge and experience of the different sectors of our industry.

In recent years the Board has overseen a massive change in the way Irrigation Australia operates on behalf of its members, including:

- restructuring the way membership works, including major reductions in membership fees, electronic invoicing, online events calendar and booking, and structured direct and social media communications
- promoting and supporting the growth of regional committees, to focus on issues of immediate relevance to those regions
- using the results of regular annual member surveys to ensure the direction of the organisation is in line with industry ambitions and goals
- increasing the visibility of the organisation by engaging and partnering with like-minded related industry bodies, and building relationships with local, state and federal government agencies
- placing strong emphasis on increasing the skills and competency of industry members by providing increased training opportunities and focusing through the online Centre of Irrigation Excellence
- working with state and cross-border agencies on critical issues such as metering
- working with federal and overseas governments and international bodies such as ICID to showcase the expertise our Australian irrigation industry can offer

- working to upgrade and enhance the scope and definition of irrigation competencies under the National Training Framework, resulting in a structure recognising the role of Irrigation Technician as a trade

- working with departments of education and training in various states to implement VET-funded irrigation industry training.

On behalf of all members, thanks to our Executive and staff who have worked tirelessly on these activities and more.

Of course, Irrigation Australia needs to operate in a financially sustainable way, and the Board and CEO focus on working on behalf of members to ensure our efforts are invested in areas which provide for long-term sustainability of the organisation. A key consideration for the Board in the coming year will be identifying the appropriate structure and staffing levels required to support the increased responsibility for industry training and certification.

I encourage all members to participate in whatever way you can to ensure that YOUR association continues to represent YOUR needs. Take the time to respond to the upcoming industry survey, consider the opportunities for nominating for the role of director and engage with your industry organisation in a productive way at every opportunity. Your involvement is what makes our industry organisation work!

Andrew Ogden
Chairman



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FROM THE CEO

I'm sure that every previous CEO and Board member of Irrigation Australia would agree on at least this one thing, and that is that our industry needs a trade qualification. After a long period of perseverance our industry has finally achieved this goal. The trade qualification of Irrigation Technician has been approved and you can read about this exciting new development in this edition of the journal (see over page).

This is a giant step forward for our industry. Finally, school leavers and mature-age students will be able to select irrigation as a career path with a trade qualification available, just like plumbers, electricians and other trade groups.

Irrigation Australia will respond to this opportunity by offering the new 22-competency Certificate III in Irrigation course. This isn't to forget all of you who have already completed the existing 14-competency Certificate III. If you want to become trade qualified, you will only need to study and complete another eight competencies.

Regrettably, dry conditions persist across much of Australia and no one is feeling the impact of this more than our farmers and their local communities. I was able to attend many of the metering workshops across regional NSW in July and August and there is no denying the emotional and financial impact this drought is having. Another sign of the effect of the drought is the many businesses that have closed in small towns and, in some places I visited recently, it reminded me of those old western movies with shuttered buildings and tumbleweed blowing around.

We all appreciate that only sustained rain will restore the health of rural communities, but we should not neglect the issue of mental health and provide support in any way possible. Whether that is feed for livestock or food for families, it is appreciated by the people that we all depend on three times every day.

While the case for introducing new metering regulations is beyond doubt, their introduction could not have come at a worse time for many irrigators. In many cases, the new regulations require irrigators to spend money they simply don't have on meters and data logging and telemetry equipment that they can't operate because of the lack of water.

Unfortunately, this is in the context of the National Framework for Non-Urban Water Metering having been agreed in 2009. Despite this agreement, ten years later we still find ourselves with a lack of compliance and disparate regulations in each state.

This presents real difficulties for Irrigation Australia to ensure that we deliver a certification program for non-urban meters that has the utmost integrity. Our certified meter installers and validators are professionals who have the responsibility of validating water meters and ensuring that they carry out their duties consistent with the various requirements of each state's regulations. We are all aware of the problems besetting the building industry currently with uninhabitable high-rise apartments and issues with

flammable cladding. This issue has been described as a failure of certification. At Irrigation Australia we take our responsibility extremely seriously to implement a certification program of integrity.

There has never been a better case for a uniform set of national water metering guidelines than we have at present.

Finally, on a more positive note, it was a great pleasure to attend the Waterwise Expo in Perth at the new Optus Stadium in August and see the department responsible for water, the water utility and the irrigation industry working hand-in-hand to promote the efficient use of water. We were grateful to have the Minister, Hon. Dave Kelly, Director General of the Department of Water and Environmental Regulation Mike Rowe and the CEO of the Water Corporation Pat Donovan attend, speak and support the event.

It was a well-organised event, and hats off to the local regional committee, the exhibitors and Tracy Martin and Ellen Slobe from our Perth office for making this such a success.

Bryan Ward
CEO

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TRADE QUALIFICATION ESTABLISHES CAREER PATH FOR IRRIGATION

In one of the most significant developments for our industry in the last decade, in August it was announced that there now is a trade qualification in irrigation, called Certificate III in Irrigation Technology. This means that young people, school leavers and mature age job seekers can compare a trade in the irrigation industry with other trade qualifications such as plumbing, mechanics and electrical when choosing a career.

Irrigation Australia CEO Bryan Ward said this great achievement was due in no small part to the endeavours of Geoff Harvey and his team at Irrigation Australia together with the support of our members.

“It also is a testament to the years of effort that the association and its members have invested in identifying and defining a career path for irrigation and working to have it recognised as the important trade that it is. This is a process that began in the early 1990s when Scott MacLean was chair of the Irrigation Association of Australia (IAA) board, so it has certainly been a long haul,” said Bryan.

In 2006, the IAA instituted a process to develop skill sets based on national qualifications. A lot of work has been done since culminating in the development and submission of the Irrigation Skills Package for review through funding from the Australian Industry Skills Council (AISC). A crucial step was the submission of a ‘case for change’ by Skills Impact to AISC in June 2019.

The result? A trade qualification called Irrigation Technician (trade level).

“This trade qualification is at Cert III level. Because there are twenty-two competencies in this qualification, people who already have a Cert III in Irrigation will need to complete eight additional competencies to become trade qualified,” explained Geoff Harvey.

What does this mean for the irrigation industry?

In simple terms, this means that the irrigation industry has the career path that so many members have worked for over the years. It can now offer courses from Cert II right through to diploma, putting it on an equal footing with other industries that offer trade qualifications.

“This defined career path means we can attract young people to a career in irrigation as well as have a process for recognising the skills and knowledge of current industry professionals,” said Geoff.

Importantly, the new Cert III will be flexible so that only people interested in a trade qualification will have to complete the 22 units.

“Others might want an irrigation qualification at Cert III level but don’t want to become a tradesperson. They can choose to complete only the number of units required for any of the skills sets and then receive a statement of attainment, which will qualify them to receive a certification from Irrigation Australia,” explained Geoff.

First courses in early 2020

According to Geoff there are still some administrative processes to go through before Irrigation Australia can begin delivering the new Certificate III in Irrigation Technology qualification.

The first step is adding the qualification to the www.training.gov.au website, expected in November this year.

The second step will be a bureaucratic one involving state governments recognising the qualification as a trade.



The irrigation industry now has a trade qualification called Irrigation Technician. To qualify as an Irrigation Technician, industry members will need to complete 22 units of the Irrigation Certificate III course.

“This is a crucial step as recognition is required for state governments to add the qualification to their apprenticeship trainee programs,” said Geoff. “Without this, people can complete the trade qualification, but it will be on a full-fee basis rather than supported by government.”

The third step will be to help establish an award for qualified people, however, this process is still not clear so we will keep everyone posted once we know more. A possibility is that the award for similar trades may be applied to people with the new irrigation qualification, something that would be quicker and simpler than developing a new one.

“We are expecting that while all the steps won’t be complete, especially establishing an award, we should be able to start delivering our first Certificate III in Irrigation Technology training courses in early 2020,” he said.

The 22 units of competency will take at least two years to complete for new students, however, more time may need to be completed to get their required experience in the workplace.

Our understanding is that once the new Certificate III in Irrigation Technology qualification is available on the www.training.gov.au website, RTOs will be given 12 months to accommodate the new qualification, and if they want to offer the trade qualification will need to apply to have it included on their scope.

Information

Irrigation Australia will hold Certificate III and top-up training courses as required. Interested in becoming trade qualified as an Irrigation Technician? Contact Geoff Harvey, email geoff.harvey@irrigation.org.au or phone 07 3517 4000 for more information and to register your interest.

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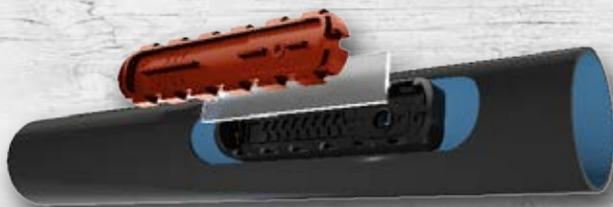
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STADIUM PRECINCT AN IRRIGATION CHALLENGE

Optus Stadium is a world class, 60,000-seat sports and entertainment venue by the Swan River in Perth that was officially opened at the beginning of 2018. While many Australians would have seen the stadium on television when it has been used to host premier league games such as AFL, soccer, cricket, rugby league and rugby union, fewer would be aware of the surrounding parklands, which were also completed as part of the construction project. These public parklands (an area of 41 ha) serve a dual purpose by providing recreational amenity and supporting the health of the Swan river.

One of the organisations charged with bringing life to what was a degraded and contaminated site at the start of construction in 2013 was HASSELL, an international design practice with studios in Australia, China, South East Asia, the United Kingdom and the United States. Their landscape architecture team was responsible for designing and delivering the stadium parklands now known as Stadium Park and the Chevron Parklands. In this article, Hannah Galloway from HASSELL, describes the project and its challenges, particularly for specifying the irrigation system.



The site of Stadium Park and Chevron Parklands in Perth, which was once contaminated with industrial waste, has been “healed” and transformed into a beautiful environment that adds considerably to the city’s green infrastructure. Photo: Peter Bennetts, 2018.

Site challenges

The precinct site has had a varied history, which meant that a prime consideration was to “heal” the area so that it could be transformed into a beautiful and engaging natural environment which promotes healthy activity, social interaction and cultural learning.

Before construction, the stadium area had been part of the Burswood Golf Course and before that had been used as a refuse tip and cement works. The neighbouring James Hardie Industries’ factory, which had manufactured

asbestos-based products for the building industry, closed in 1981. This history meant that the soil and lake sediments contained contamination, including coal ash slurry, sewage deposits, asbestos, domestic rubbish and industrial fill. Part of the site was also prone to flooding.

Stormwater management the key. When designing the precinct area, including the irrigation system, many of the choices were driven by stormwater management. Infiltration of stormwater at source is not typically difficult in Perth’s deep sandy soils. This site, however, has very poor infiltration rates associated with subsurface refuse deposits. Improving infiltration on site was based on incorporating extensive temporary wetland detention areas. The poor infiltration rates across the site required a significant proportion of planting beds to function as swales, bio-infiltration areas or detention basins. For larger storm events, water that cannot be detained in planting areas overflows into long swales before entering the Swan River or the river-fed lake.

Managing contamination. This lake, which acts as a final detention basin and sediment trap before water enters the Swan River, was built as an irrigation supply and water body feature for the Burswood Golf Course. Both the lake and river foreshores contain contaminated sediments. Designing public recreation amenities in a location next to water bodies containing contaminated sediments and edged by eroding embankments required a design approach focused on making the areas safe for public use.

The solution was to leave contaminated areas undisturbed and to eliminate contact with contamination through a combination of capping contamination with topsoil, installing subsoil markers to ensure contamination is not disturbed by future maintenance activities and restricting access to the contaminated waterbodies through planting dense fringing revegetation.

Irrigation strategy

The irrigation strategy for the precinct area had to manage a range of issues.

Water sources. While bore water is the main water source, this is supplemented with harvested rainwater and scheme water.

A common problem with bore water in Perth is the level of iron, both dissolved and solid. The project brief specified that there could be no iron staining of hardscape areas, so all bore water was required to be treated using an iron filtration system. This system has five large filtration tanks that remove soluble iron through a unique, two-part procedure:

- Oxidation. Air is injected through a venturi via a booster into the raw bore water. This starts the iron oxidation process.
- Filtration. The oxidised water then passes through a naturally occurring catalytic media catching the precipitated iron.

The iron filtration unit can remove iron for 15 hours of service (bore operation), after which time the filtration system will automatically backwash using the groundwater from the bore. This process rids the filter of accumulated iron effectively recharging it for its next operation period. A rinse stage cleans the filter before returning it to service.

Rainwater harvesting, supplemented with scheme water, was incorporated into the site for areas that needed special consideration such as the pitch and cricket wicket nursery. These sources were used to avoid risks associated with quality and supply that could occur by using bore water.

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TECHNOLOGY: URBAN



Separating vegetated areas into hydro-zones enabled different crop factors to be determined and irrigation schedules set to ensure irrigation water is used efficiently. Photo: Robert Frith, 2018.

Irrigation system control. With such a large area, a central control system is used to manage and schedule watering. The central location links to three separate control points in the precinct, all of which are housed in tamperproof lockable pillars.

Irrigation strategy. The precinct is a large area with complex irrigation requirements. The following list gives an idea of the scale of the undertaking:

- 1,380 trees planted
- 23 existing site trees transplanted on site
- Over 100 linear metres of felled trees were repurposed for nature play features and habitats for insects
- Over 4,000 m² of lakeside planting
- Over 6,000 m² of rivers edge bio-engineered and planted
- Over 4,000 m² of site salvaged topsoil has been used within the Chevron parkland
- 350 m lakeside boardwalk installed.

Vegetation areas have been separated into hydro-zones, i.e. active turf (community oval), passive turf, rehabilitation planting (tube stock) and gardens with 150 mm pots. The reason this was done was to determine the different crop factors that vary throughout the site. Most sites are watered using bore water and

rotary spray systems, although drip is used for garden beds next to hardstand areas.

Watering requirements across the precinct were calculated based on:

- evapotranspiration
- landscape coefficients
- seasonal changes.

The depth of water to be applied using irrigation (mm/day) was calculated by dividing the reference evapotranspiration (ET_o) by days per month x the landscape coefficient (ET_o/days x KL).

Landscape coefficients are made up of a species factor (type of plant), density factor (volume of plants per square meter) and a microclimate factor (location of planting around the site, e.g. near a hardscape or shaded by other vegetation).

The result

The challenges of establishing the parkland and irrigating the site were complex and required a multi-disciplinary consulting team to ensure a sustainable and resilient outcome. While dealing with technical issues the team did not lose sight of the goal, which was to create a beautiful and engaging natural environment which promotes healthy activity, social interaction and cultural learning.

Information

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Optus Stadium Project Team

Head Contractor and Client: Multiplex

Architecture JV: HASSELL, COX and HKS

Landscape Architect: HASSELL

Irrigation Consultant: LD Total

Irrigation Contractor: Total Eden

Landscape Contractor: Deep Green

Civil and Stormwater Engineer: BG&E

Hannah Galloway, Senior Associate, HASSELL, Perth



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MODERNISATION PROJECT RECEIVES INTERNATIONAL RECOGNITION

The Trangie-Nevertire irrigation scheme modernisation project undertaken in western New South Wales was recognised at the World Irrigation Forum and International Executive Council meeting held in Bali in September, where it received an ICID WatSave Innovative Water Management Award. This award category is for non-technological interventions or innovative land and water management techniques that increase the availability of water for different uses, or research or new policies that lead to savings in water applications or uses.

Project shares water saving with users and the environment

The 100,000 ha scheme of mixed farming enterprises on the Macquarie River is owned and managed by member-owned organisation, the Trangie-Nevertire Co-operative Ltd (TNCL). Opened in 1973, the scheme services 66 farms and supports 21,450 ha of irrigation.



Jim Winter and Tony Quigley receive the ICID WatSave Award from ICID President Felix Reinders. The award recognises water savings achieved as a result of the Trangie-Nevertire Irrigation Scheme modernisation project.

By the early 2000s, however, TNCL knew that modernisation was unavoidable, in part because of conveyance losses in the system as well as a series of low or zero water allocation years.

The modernisation, completed in 2014, was funded under the Private Irrigation Infrastructure Operators Program, which is part of the Australian Government's Sustainable Rural Water Use and Infrastructure Program (SRWUIP). TNCL received \$115 million for the project, which resulted in total water savings of almost 30,000 ML. These savings have been shared between water users and the environment, with the environmental savings going to the Ramsar-listed Macquarie Marshes.

Project challenges

The project had five major elements, as follows:

- Reducing the earthen channel system from 240 to 138 km and retiring 17 members permanently from irrigation.
- Rebuilding the remaining 138 km of channel system, lining 108 km with Firestone EPDM rubber membrane, rebuilding about 30 km of earthen channel, and installing a complete Rubicon water gate system, all enclosed within electric animal exclusion fencing.
- Installing a 230 km stock and domestic pipeline from the river to all continuing and retiring members' farms to replace the previous reliance on the channel system.
- Modernising the remaining members' on-farm irrigation infrastructure, with 24 linear move or centre pivot irrigators installed, as well as upgraded field layouts, tailwater return systems and storages.
- Decommissioning the irrigation infrastructure on those retiring members' farms and reconfiguring them back to a dryland basis including the provision of piped stock and domestic water reticulation.

A major challenge was to do with lining the 108 km of channel, something very few organisations globally had tried on this scale.

The project managers (Farrell Coyne Projects) visited other irrigation schemes both in Australia and Spain to assess options. From a shortlist of 10 liner products, two were chosen to be trialed by laying them on 500 m sections of prepared channel. The decision was then made to go with the Firestone GeoGard product.



Infrastructure renewal in the Trangie-Nevertire Irrigation Scheme replaced earthen channels with lined channels.

Once the earthworks were completed several liner installation issues had to be solved in the field. These included systems to unroll and correctly align the geofabric underlay and liner, a system to compensate for the 5 per cent shrinkage that would occur as the EPDM cured over time, developing tools to cut the side anchor trenches into the compacted channel bank and techniques to join the rolls and terminate the liner at each in-stream control structure.

These issues were all solved, and by the end of the project the laying team were able to achieve over 2 km of liner laid, joined, anchor trenched and terminated in a day.

The nearby Narromine Irrigation Board of Management was impressed with our liner solution to similar seepage losses in parts of their system and went on to use the same material and installation technique.

Source of water savings

The water savings in the project came from four main areas, as follows:

- Reducing the original earthen channel length by 40 per cent, allowing 17 of our members to retire from active irrigation and reduce the footprint of the irrigation system substantially.
- Lining 138 km of rebuilt main channel with EPDM rubber led to large reductions in seepage losses, especially where the channel crossed porous soils and paleo channels closer to the Macquarie River. EM38 testing and groundtruthing confirmed that up to 2 m of water column per day was being lost to deep drainage in the worst of these prior streams. Clay lining such leaky areas had been trialed previously, but the → [page 40](#)



DESIGN SUCCESS UNDERLINES IMPORTANCE OF COMMUNICATION

Earlier this year, Irrigation Australia member Jim Philips received a prestigious award from the American Society of Irrigation Consultants for designing an irrigation system upgrade on a macadamia farm in Queensland. Jim takes up the story, describing the project and why it won the award.

Gary and Julie Davis have a reputation in the macadamia industry for growing premium macadamias on their property at Donnybrook, north of Brisbane. I met Gary and Julie while doing irrigation design work on macadamia farms owned by their daughter Aimee Thomas and her husband James.

Late in 2016, Gary rang me and said that, with his son Mitchell, he and Julie had bought a macadamia farm at Canina, near Gympie under the business name GJ&M Nuts. The pump used for the irrigation system was old and they were having trouble identifying it. Could I come and check it out and provide some advice on upgrading the whole system? On investigation, I confirmed that the pump was an ancient Regent RM15, probably up to 30 years old, so it certainly had had a long working life.

System redesign agreed

After a farm visit, we agreed that the sub-mains, laterals and sprinklers needed to be re-designed and replaced. As well, we discovered that the DN80 PVC main was in fact a DN65 PVC main, which needed to be replaced. The old pump, however, would remain.

Water supply for the farm is a 30 ML dam so the irrigation design would be for a supplementary system only. This was an adequate system for the 15.8 ha of macadamias.

On James and Aimee's irrigation project, we changed the system from one sprinkler to two sprinklers between the trees to improve the coefficient of uniformity, distribution uniformity and the scheduling coefficient.

Mitchell saw the difference between the single sprinkler and dual sprinkler wetting patterns, and opted for a dual arrangement, but with low-throw

sprinklers. These lower rate sprinklers were better for his clay soil types as they required a low infiltration rate to stop pooling and water running down the slopes. Also, I suggested to Mitchell that he install a local zone fertigation system to allow each zone to have an injection point at each station.

The property is steeply undulating with contours ranging from 100 to 160 m. The macadamia rows run down the slopes at 90 degrees to the contour lines. The challenge in this design was to accurately size sub-mains and lateral lines in the steep topography so that the operating pressures stayed within the pressure limits of both the low-density polyethylene tube and the optimum operating range of the pressure regulating micro sprinklers. The topography prohibited the use of non-compensating sprinklers.

Sub-main sizing on these slopes telescoped down from DN80 PVC to DN25 PVC and lateral tubing from 25 mm LDPE down to 10 mm LDPE.

Pipe sizing critical

If one aspect of this design had to be identified as critical to the successful operation of the system, it was the decision to use of the 10 mm LDPE. No other aspect of the design caused as much heartache and discussion as including this pipe. When Mitchell contacted supply companies and asked about using 10 mm LDPE he was told either that it was not available, fittings were not available or nobody uses it.

The issue was that, based on the hydraulic modelling, it was obvious that we had to use it or completely re-design and re-route the main lines. This would also mean subdividing the existing irrigation zones into smaller zones to offset the slopes.

After a lot of searching and enquiry, we finally established that the 10 mm tube was available and we could get fittings so we did use it.

It has proven to be the decision that has made this system operate within the limitations of the pipe pressure rating and the sprinkler operating pressure range.

The owners chose to install the new system with staged site visits by JP WATER. The installation had to be carried out around normal farm operations and with, at times, rainy weather. As is all installation work, it was a long and tedious job.

Then came the day, and the button was to be pushed. Would the old pump do the job? Would the use of the 10 mm LDPE be justified?

From the start, the system worked as designed and the pressures were right. Unfortunately, the old pump struggled and, finally, it gave up the ghost so we installed a new one.

Lessons learned

The positive outcome of this design highlights the importance of close collaboration between an irrigation designer and the irrigator. This was also a key reason for it winning the award.



(l to r) Jim Philips, Mitchell Davis and Gary Davis worked together to redesign an irrigation system that was efficient and complemented the day-to-day operation of the Davis macadamia orchard.

While the designer can apply his or her knowledge of hydraulics, pumps, soils and climate, it is of limited use if it is not applied with the intimate knowledge the operator has of his or her farm and crop. A design must be part of the overall management strategy of the farm and complement its day-to-day operation, not hinder it.

In this instance, Mitchell researched the sprinkler he wanted and became involved in the decisions affecting the hydraulic design of his system. This practical involvement in the design process means that he has a working understanding of the potential and the limitations of his system and how to manage it.

From my perspective as the designer, it meant that I was not offering Mitchell a *fait accompli* based only on my decisions, but a system that drew on the knowledge and experience of both of us.

It was a rare pleasure for me to work with Mitchell, Gary and Julie on this design and then see it go on to win this award.

Jim Philips, JPWATER Pty Ltd

THE AWARD

JP WATER P/L is a member of the American Society of Irrigation Consultants, a worldwide body based in East Lansing, Michigan, USA. Every year the society present awards for outstanding and unique designs.

Jim asked Mitchell, Gary and Julie if they would allow their design to be entered for consideration by society's panel of American irrigation designers. The Davises agreed, which resulted in the panel assessing the design from a professional designer's perspective and discussing the design and their relationship with JP WATER with Gary, Julie and Mitchell over the phone. It also meant that JP WATER had to send the panel all aspects of the design for assessment.

Recently they were advised that the design had been awarded the society's highest award, the Honour Award. They were invited to San Diego for the presentation but, unfortunately, no one was available to go.



The Honour Award received by JP WATER and the Davis family for the successful redesign of the irrigation system on their macadamia orchard.



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LINKING SOIL MOISTURE, CLIMATE AND ACCOUNTING FOR IMPROVED IRRIGATION DECISION MAKING AND WATER PRODUCTIVITY

Dr Joanne Tingey-Holyoak from UniSA's Business School is currently leading a project team including Sentek Pty Ltd and growing partners to develop a farm water accounting tool that links costs to soil moisture and climate data. In this article, Joanne describes the project and progress so far.

The tool, called WaterLink, will use soil moisture data integrated with climate, business and accounting data to demonstrate how to facilitate a better understanding of trends, forecasts and savings on a farm. Currently, results of proof-of-concept works are being fed into prototype software developed by UniSA School of Information Technology and Mathematical Sciences.

Analysis of data reveals hidden costs

Research data analysed from on-farm case studies conducted in 2018 in potatoes (Murraylands) and viticulture (Adelaide Hills) included soil moisture, drainage, evapotranspiration, rainfall, irrigation applied and forecasting information. Data collected from farm accounting systems included the full costs of irrigating - from the cost of water and energy for pumping, to costs of storage, maintenance, interest, insurance, depreciation, labour and licensing. These costs were scaled to the field- and season-level for analysis of cost structures, profit and water productivity.

Results for both potatoes and viticulture have revealed that the hidden costs of irrigating when tracked in a simple cross-seasonal comparative tool have a powerful effect on decision making.

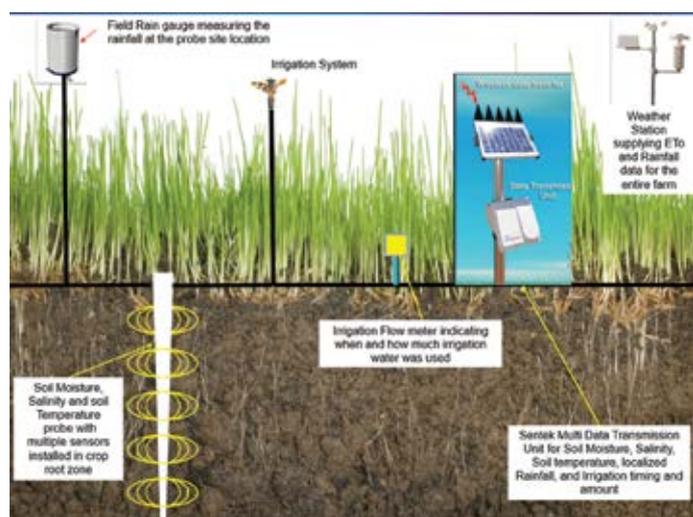
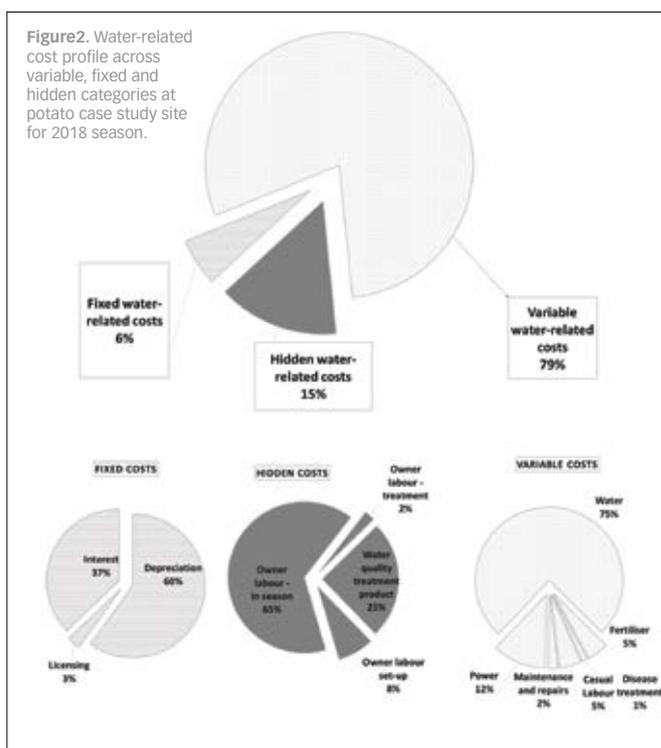


Figure 1. Visual depiction of soil moisture probe and weather station setup used at the potato case study site.

It is well known that even though potatoes are relatively productive water users that yield more food per water input unit than any other major crop, modern varieties are sensitive to soil water deficits and need frequent irrigation.



Potato production in the lower Murray, where the case study farm is located, is characterised by almost year-round harvesting. The region notoriously suffers from low rainfall and issues with its mainly sandy loam soils, where water percolates quickly, requiring frequent irrigation to avoid plant stress. This comes with significant, previously unidentified, costs as revealed through developing WaterLink.

While the case study grower was aware that irrigation and energy costs were significant for the 28 ha field site under centre pivot irrigation, being able to use WaterLink to track all costs, including owner labour and water quality treatment, meant that between 15 and 20 per cent of total costs previously unaccounted for were made visible.

According to growers, water quality issues were things like grit causing centre pivot nozzles to clog, despite irrigation water being filtered (requiring nozzles to be cleaned out by hand), and water-borne algae requiring treatment with an algicide or fungicide (involving the cost of the product along with labour to apply it).

For the 7.13 ha viticulture block under drip irrigation, it was also found that hidden costs of labour for irrigating, particularly frost-related treatments, was about 40 per cent of water related costs when tracked through development of the tool.

Improvements underway

Discussions with the producers have revealed the need for WaterLink to not only to expose the full cost of irrigating to identify areas of possible cost saving

and to provide productivity updates, but also to integrate as much as possible in the way of all available data in one spot, including energy market costs and weather forecasting.

As a result, the WaterLink prototype has been developed to include cost-informed alerts and cost-informed forecasting and scenario analysis.

Cost-informed alerts. Sensors can provide data on all key agronomic indicators, including plant stress, low quality irrigation e.g. when it is very windy and disease conditions e.g. soil temperature. By linking this data to costing information and yield prediction outcomes, alternative action can be advised.

Cost-informed forecasting and scenario analysis. Scenario models have been developed that can provide costed irrigation action support. Example mapping revealed increased utility of this function for producers paying wholesale power prices which creates great variability in pumping costs, especially in peak seasons.

Importance of including all relevant data to decision making

While the water productivity of the two growers participating in the study was good when compared to common national and international indicators, comparing costs to revenue showed the impact of including all water-related costs on profit erosion. This supports the need for all direct and indirect costs to be integrated with sensing data for any water accounting so that irrigators can make decisions that are fully informed.

This research and the development of WaterLink reveal the often-hidden costs labour and water treatment, which is necessary as a first step to understanding any type of farm productivity in real terms. During our study, we found that while factors such as the effects of plant stress, disease and frost can be visually detected, often the damage has already been done to yield making it difficult to recover. By linking sensing and costing information, it is possible to tell the precise point where plants are not getting the water they require and integrating yield outcomes.

The aim of WaterLink is to alert irrigators to what is happening in the soil and plant climate during and between irrigations, what their cost is, and what the cost is of waiting for conditions to change. Through early warning and forecast systems that contain the advice of true costs, better irrigation decision making is possible.

In our current climate, the need for better informed irrigation decision making has never been so great.

Information

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DESIGN & INSTALLATION FEATURE

Design for the best

Having irrigation design standards that are consistently high and based on best practice is an important element in ensuring the continuing confidence of clients, be they large or small, in the service provided by designers.

The advantages of having a standard practice or design process that is based on best practice are many. It allows for consistency by providing a guide that people can follow when they are undertaking a particular task or set of tasks, something that is especially important if you employ a number of staff, and they allow you to show your clients that you are working to industry standards.

When you are quoting on a job, designing an irrigation system or installing one, do you have a procedure backed by a standardised process that you and your staff follow?

Rural Irrigation System Design Guidelines is a handy guide that will help you identify best practice for designing piped irrigation systems. While this publication has been written for rural systems, the principles apply equally to urban situations.

It is divided into two sections – one detailing irrigation design parameters and the other, irrigation performance parameters. To give you an idea of the information included in *Rural Irrigation System Design Guidelines*, Table 1 shows the parameters that should be considered to complete an irrigation design. Each of these parameters are then described in detail.

TABLE 1. IRRIGATION SYSTEM DESIGN PARAMETERS.

Base design parameter	Unit(s)	Associated information
Area considered for irrigation	Hectares (ha)	<ul style="list-style-type: none"> Area layout - size and shape Greenhouse growing structures (Nurseries) Size and quantity of containers (Nurseries) Physical obstacles (fences, trees, buildings, etc.) Land restrictions (protected areas, etc.) Topography
Water supply	L/s	<ul style="list-style-type: none"> Quantity/allocation Source (i.e. dam, bore, etc) Quality Re-use (Nurseries) Energy source for pump
Crop/plant		<ul style="list-style-type: none"> Type/s Growth stages and timing Cultivation practices Root depth Crop coefficients
Soil – Readily Available Water (RAW)	mm/m	<ul style="list-style-type: none"> Soil or growing medium information Soil structure Field capacity and permanent wilt point Refill point Infiltration rate/s
Climate		<ul style="list-style-type: none"> Evapotranspiration Rainfall Wind Managed (greenhouses)
Management requirements		<ul style="list-style-type: none"> System integration System type (sprinkler, drip, pivot, etc?) System compatibility Labour skill and availability Process control Risk appetite Price budget
Irrigation system capacity – designed and managed	mm/day	<ul style="list-style-type: none"> Irrigated area Peak crop water use Gross application rate (depth of water applied in mm over time) Application efficiency (%) Operating hours: <ul style="list-style-type: none"> Irrigation cycle (duration and frequency) Pump utilisation ratio (PUR) Flow rate of irrigation system

The same information is supplied for performance standards (Table 2).

TABLE 2. IRRIGATION SYSTEM PERFORMANCE STANDARDS.

Indicator	Associated information	Standards
System capacity (based on 24-hour delivery)	<ul style="list-style-type: none"> Flow rate of irrigation system (L/s) Irrigated area Actual hours of pumping per day 	Meets the peak irrigation requirements of the crop
Ratio of system capacity to peak season crop irrigation demand	<ul style="list-style-type: none"> Design system capacity Managed system capacity 	80–120%
System application depth	<ul style="list-style-type: none"> Refill point Gross depth of water applied (mm) 	< 50% of RAW
Irrigation cycle	<ul style="list-style-type: none"> Return interval able to be achieved with each system type 	Meets the peak irrigation requirements of the crop
Application uniformity	<ul style="list-style-type: none"> DU CU 	DU > 80%
Average application intensity	<ul style="list-style-type: none"> Gross depth of water applied Time (hours) taken to physically apply water 	CU > 85%
Potential application efficiency	<ul style="list-style-type: none"> Estimated from field distribution and depends on system type 	< Infiltration rate of the soil
Water velocity	<ul style="list-style-type: none"> To limit potential water hammer in irrigation system pipelines Vary for flushing and filtration 	75 – 95%
Hydraulic efficiency	<ul style="list-style-type: none"> Pressure loss through fittings 	Max = 1.5 m/s
Pump system efficiency	<ul style="list-style-type: none"> Pump system efficiency % (pump/motor efficiency) 	> 90% i.e. losses through fittings not to exceed 10% of total losses. Best possible depending on duty and pump type
Pump operating cost	<ul style="list-style-type: none"> Cost per volume of water pumped KWh of energy used per volume of water pumped related to pressure 	\$/ML < 5.0 KWh/ML/m
Micro irrigation/point source	<ul style="list-style-type: none"> Emission uniformity Flow variation 	EU > 90% FV < 20%

Information

Interested in following up? Contact Irrigation Australia for a copy of *Rural Irrigation System Design Guidelines*, phone 1300 949 891, email info@irrigation.org.au or download the publication from website www.irrigationaustralia.com.au.

LOOKING FOR IRRIGATION SYSTEM DESIGN COURSES?

Irrigation Australia has developed three new training courses in irrigation design, a two-day urban design course, a two-day commercial design course, and a three-day IrriCAD design course.

Urban Irrigation Design. This two-day, entry-level domestic irrigation design course is suited to people who work in irrigation and landscape sales and installation, as well as irrigation system operators and managers interested in the basics of irrigation system designs. Participants will be taken through the steps required for a residential irrigation system design, including a material list costing.

Commercial Irrigation Design. This two-day, mid-level parkland/football field irrigation design course is suited to urban domestic irrigation system designers or technicians looking to take the next step in irrigation system design processes.

IrriCAD Design. A three-day high-level course for people looking to do designs for large areas such as sports complexes and in agriculture. It is suited to existing irrigation system designers looking to advance or consolidate their current irrigation system design processes using the IrriCAD design software.

For information about training and professional development go to website <https://www.coie.com.au/> or contact Kahla McKinless, email kahla.mckinless@irrigation.org.au phone 07 3517 4000.

Anne Currey, Irrigation Australia

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Waste not, want not – use it for irrigation instead

Southern Stars Holiday Park, which opened in March 2019, is located just south of Busselton in Western Australia. It has 105 powered camping and caravan sites supplied from an onsite bore with water that is treated to drinking water standard. In 2017, Earth & Water were engaged to design and install its water supply and wastewater systems. In this article they describe the process and system design.

The holiday park offers a great farm setting for campers to enjoy the country, sit around a campfire, experience farm animals and embrace the open spaces. Campers can also enjoy a farm walk through an orchard of 2000 citrus trees irrigated using wastewater from the holiday park. The trees are undersown with a kikuyu lawn, which also benefits from being irrigated.

The wastewater is re-used from several family-sized bathrooms, each containing a shower, toilet and basin in the one space. Additional facilities include a full-scale laundry, two large kitchens, a covered dining room and entertaining hall. According to the Western Australia departments of health and water and environmental regulation (DWER), this infrastructure can generate up to 55,000 L of wastewater per day (in fact, the actual flow rates are 75 L/person/day, not 150 L a day as per the Department of Health and Australian Standard specification.)

Southern Stars re-use this water to irrigate the 15,000 m² citrus orchard undersown with kikuyu. The caravan park operates 24 hours a day, so the wastewater treatment plant has to do this too.

DESIGNING THE SYSTEM

Our first step was to design the treatment system and process with our client, Southern Stars. When we had a design that worked for our client and complied with DWER guidelines, the next step was to submit the applications to DWER.

APPROVALS

We were aware that the system design would need to go through a number of approvals and government agencies. The process started with the local shire council, then the Department of Health who advised that DWER are the primary approval regulators for systems delivering over 20,000 L a day. Additional approvals were sought from departments such as Water and Rivers Commission and the Department of Fire and Emergency Services.

After eight months of submitting the designs to the various regulators and consulting with them, we were awarded works approval. In the first half of 2019, we undertook a three-month commissioning process requiring weekly monitoring, water sampling and record-keeping for the operator license (final approval).

Nutrient Irrigation Management Plan. A critical part of the approval process was to submit a Nutrient Irrigation Management Plan (NIMP). The NIMP is a bit like a profit and loss sheet defining wastewater seasonal effluent outflows and nutrient load. The NIMP needs to confirm that no nutrient leaching occurs through over-irrigation or rainfall and that nutrients are taken up by plants and trees throughout the season.

Citrus and kikuyu grass require high ratios of nutrients, especially nitrogen and phosphorous, as well as acidic soils, which allow better uptake of phosphorous in low PBI (Phosphorus Buffering Index) soils.

The NIMP calculated that the trees should be planted in two stages (1.5 ha x two plantings) to accommodate predicted increasing wastewater volumes as caravan park occupancy grows to maturity. The trees are planted in 3 m wide rows with 2.5 m between each tree. Kikuyu grass is seeded in the inter-row to prevent soil erosion and make the orchard look great as well increase extraction of nutrients.

After the settling (commissioning period) DWER will decide if we need to increase the area to 3 ha from a current 1.5 ha. The department might also request a holding dam to store excess effluent irrigation in winter if the field is saturated.

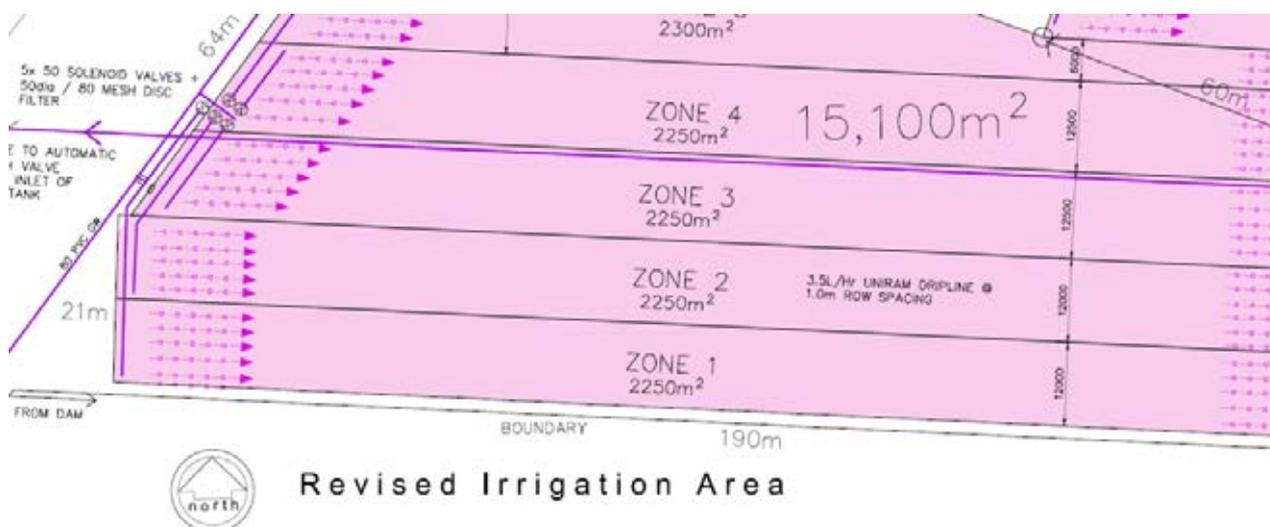


Figure 1. The system design included block layout and specifications for irrigation of the orchard.

HOW THE SYSTEM WORKS

The wastewater management or flow process uses a simple system of collection of sullage water (grey water) from the van's showers and basins. The sullage points and toilet-blocks drain into a common pump pit with a pair of standby/delivery macerator pumps for pump out to the main treatment plant.

All the pump-pits and treatment plant have audio-visual alarms to alert the van park operator of failure.

The wastewater treatment system starts with three settling and flotation tanks and then drains into the aeration and treatment system, and finally into the irrigation holding and disinfection tank for chlorination and final settling.

The treatment system is a closed-loop system with sludge and solids returned to the first treatment tank for settling and breakdown. There is very little odour as the wastewater treatment system uses air scrubbing for odour control and the vent is mounted on the farm shed about 20 m above ground.

The first tank becomes the sludge tank for solids, which are removed by a licensed waste management contractor.

The liquid effluent then passes into the settlement chamber. Any solids will drop out and high-quality effluent drains into the disinfection chamber for chlorination using chlorine tablets. Finally, the effluent drains into the pump-out tank (irrigation tank). The irrigation water goes through a set of four deep media sand filters to provide suitable treated effluent water to the subsurface dripline. The sand filter rinse product is returned to the first septic tank for settling and further breakdown.

A 50 mm water meter inside a locked box monitors and logs flows for future recording and monitoring. A sample valve is located next to the water meter.

A signal irrigation controller uses flow technology and is programmed to allow uniform application of the treated water. A soil moisture probe is connected to the controller to stop or divert irrigation if the field has reached saturation.

The irrigation is dispersed to areas via seven solenoid valves, which sequence the amount of water equally through the citrus orchards. Each irrigated zone is automatically rinsed back to the first treatment tank after each irrigation cycle to prevent fouling of the dripline.



Dripline being installed to irrigate citrus trees with wastewater.



Four media sand filters supply treated effluent water suitable for irrigation to the orchard's subsurface dripline.

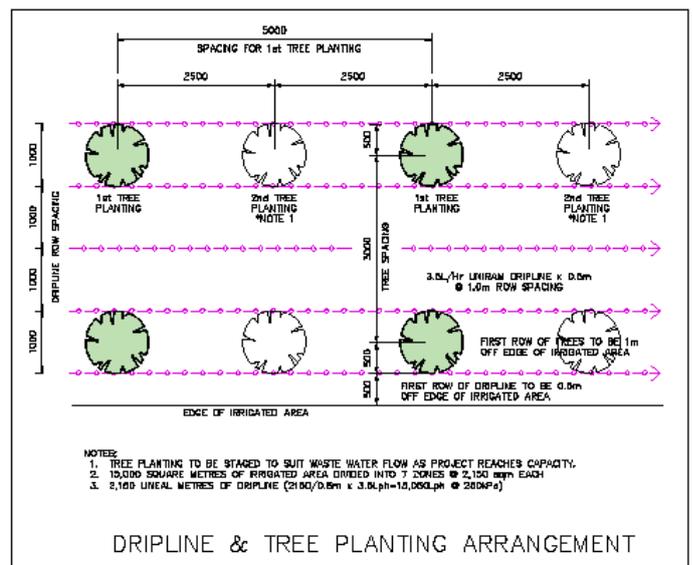


Figure 2. Orchard and dripline arrangement.

The infrastructure and buildings started in January 2018, and Southern Stars opened in March 2019.

Acknowledgment. Thanks to *The Overflow* for allowing this article to be reproduced.

WHAT'S DRIVING HIGH WATER PRICES IN THE MURRAY-DARLING BASIN?

Water prices in the southern Murray-Darling Basin have reached their highest levels since the worst of the Millennium drought more than a decade ago. These high water prices are causing much anxiety in the region, and have led the federal government to call on the Australian Competition and Consumer Commission to hold an inquiry into the water market. Neal Hughes, senior economist with ABARES, explains that lack of rain is the main cause.

Inevitably, whenever an important good becomes more expensive – be it housing, electricity or water – there is a rush to identify potential causes and culprits. In the past few years high water prices have been blamed on foreign investors, corporate speculators, state government water-sharing rules, new almond plantings and the Murray-Darling Basin Plan.

While some of these factors have affected the market, they are in many ways a distraction from the simpler truth: that high water prices have mostly been caused by a lack of rain.

Supply drives the market

Market reforms in the 1980s and 1990s enabled water trading in many parts of Australia. By far the most active market exists in the southern Murray-Darling basin, which covers the River Murray and its tributaries in northern Victoria, southern New South Wales and eastern South Australia.

The market allows users – mostly irrigation farmers – to trade their water allocations (effectively shares of water in the rivers' major dams). This trading helps ensure limited water supplies go to the farmers who value them the most, which can be crucial in times of drought.

Historical data shows the main driver of water market prices in the southern basin is change in water supply.

Figure 1 shows storage volumes (in orange) and water prices (in red) in the southern basin since 2006. Prices peaked at the height of the Millennium

drought in 2007. During the floods of 2011, they fell near zero. Prices have increased again during the latest drought and are now at their highest levels in a decade.

Lower rainfall, higher temperatures

While water prices have always been higher in dry years and lower in wet, we've been getting a lot more dry years in recent decades.

Over the past 20 years, rainfall, run-off and stream flow in the southern basin have been far less than historical conditions.

Figure 2 shows modelled flow data for the Murray River, assuming historical weather conditions and no water extraction, over the past century. It shows that average water flows this century are about 40 per cent below the average of the 20th century.

We know these reductions are at least partly related to climate change, driven by both reduced winter rainfall and higher temperatures.

Lower rainfall and higher temperatures also make crops thirstier, increasing demand for irrigation water. This was evident in January, when temperatures exceeded 35°C for 14 days and irrigators' demand for water spiked from about 4.5 to 7 GL a day.

The basin plan in perspective

The Murray-Darling Basin Plan seeks to improve the environmental health of the river system by recovering water rights from irrigation farmers. To date, more than 1,700 GL of water rights – about 20 per cent of annual water supply – have been recovered in the southern basin.

By reducing supply, water recovery was always expected to increase water prices. However, the

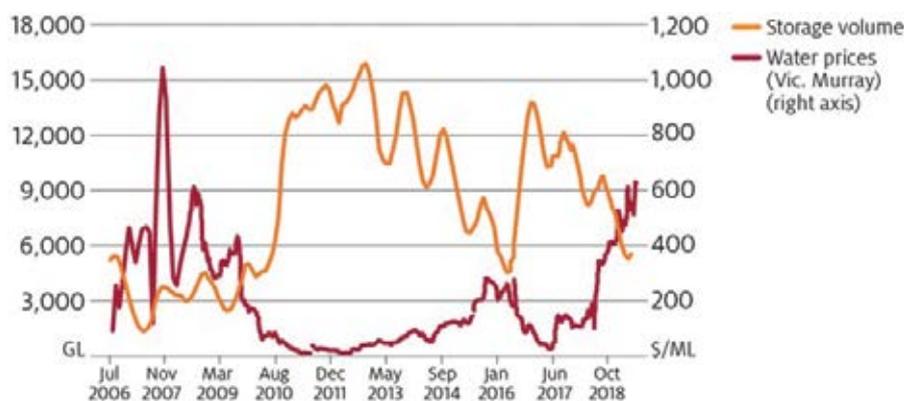


Figure 1. Water allocation prices and storage volumes in the southern Murray-Darling Basin. State government trade registers, BOM, Ruralco Water, ABARES estimates.

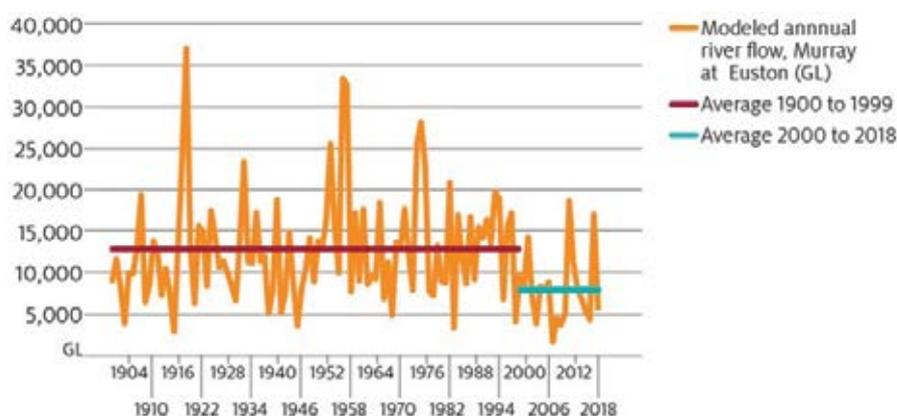


Figure 2. Modelled 'without-development' annual Murray River flow, 1900 to 2018. Murray-Darling Basin Authority.

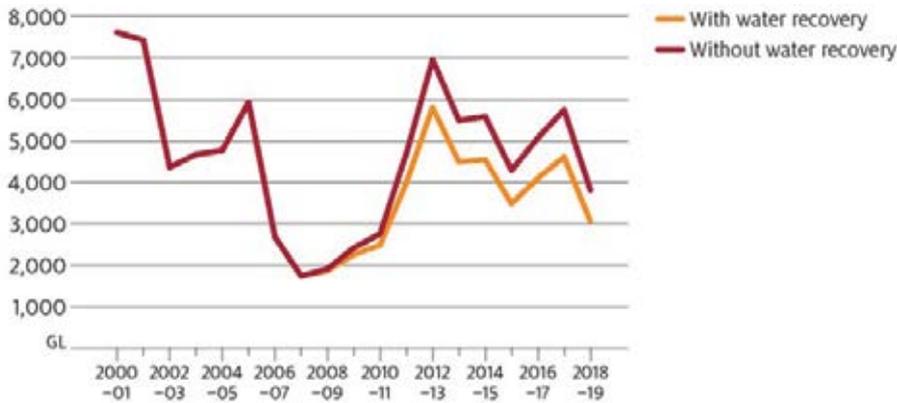


Figure 3. Water allocation use in the southern basin with and without water recovery. State government agencies, Department of Agriculture, ABARES estimates.

effects of water recovery on supply, while significant, are still small relative to the effects of climate over the same period, as shown in Figure 3.

Measuring the precise effect of water recovery on prices is difficult. Water buybacks are straightforward and have been modelled by ABARES and others. But the effects of infrastructure programs, where farmers return a portion of their water rights in exchange for funding to upgrade infrastructure, are harder to estimate.

‘Carryover’ rule changes

Historically farmers had to use water allocations within a 12-month window. The introduction of

“carryover”, most recently in Victoria in 2008, means users can now hold their unused water in dams. This rule change was a good thing, as it encourages farmers to conserve water and build up a buffer against drought.

But it might also have contributed to anxiety about the water market’s operations.

Since water allocations can be bought and held for multiple years, information about future conditions can have a big effect on prices now. For example, we see large jumps in price following news of worse-than-expected supply forecasts. This may have helped fuel concern about “speculators”.

Over the longer-term, the ability to store water

helps to “smooth” water prices, with slightly higher prices in most years offset by much lower prices in drought years. Again, this is a good thing, but it may have added to the perception of higher prices in the market.

Water demand is rising

When a profitable new irrigation activity is willing to pay more for water, as is the case with almond farms in the southern basin, competition for limited supplies can potentially drive up prices.

ABARES’ research shows that between 2003 and 2016 there was little change in irrigation demand (aside from that linked to rainfall). Growth in demand from expanding activities such as almonds and cotton was offset by reductions in others, including dairy, rice and wine grapes. There is evidence since 2016, however, that demand for water has started to increase, contributing to higher water prices. Longer-term projections suggest this trend may continue.

With drought and climate change reducing water supply, and demand for both environmental and irrigation water increasing, high water prices are only likely to become more common in the basin in future.

Acknowledgment. This article is from The Conversation, website www.theconversation.com. Accessed 19 July 2019.

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Retail roundup

We asked irrigation retailers for their perspectives on how their businesses fared in 2019 and trends for the next 12 months.

NEW SOUTH WALES



Hugh Southwell,
Southwells,
Camden, Bowral
and Cowra



Low water availability and tight economic conditions have had an impact on irrigation retail in their shops according to Hugh and Janine Southwell.

Trends this year

This year we have seen demand increase for commercial sprinkler systems, agricultural hard hose irrigators and agricultural irrigation mainlines, as a way of making better use of productive land.

2019 compared to previous years

In general, business conditions are slower. Customers have run out of water to irrigate with and/or have run out of money to spend on finding irrigation water.

Major external influences on the business

This year, water availability closely followed by tight economic and financial conditions as stated above, have been the major influences on business.

Next 12 months?

I think firefighting pumps used for fire protection will be the big mover. Sprinkler systems will be slow and pumps OK.

SOUTH AUSTRALIA



Brad Smith, Daish
Irrigation & Fodder,
Murray Bridge

Trends this year

This year has seen very few enquiries about larger project work but there has been a greater interest for smaller irrigation blocks, mainly for growing lucerne crops. I imagine that this interest is a result of last year, where many crops were unsuccessful thus creating a shortfall in feed across this area and the nation in general.

We are lucky at Daish Irrigation to have such a broad range of products and parts available in our retail store as well as the extra advantage of having a fodder store attached to both our irrigation outlets. This means that we always seem to have a reasonable amount of traffic through the store.

2019 compared to previous years

This year has been more of a traditional year with frequent rainfall providing hope for a successful season for our farmers. I believe this has a major effect on our retail business as we rely on custom from the farming community throughout our town and this certainly seems to have a flow-on effect with most businesses in our area.

It has been noticeable in previous years that when we have good rain in the autumn and winter months there is a downturn in traffic through the door, but quite often when this happens, the moment the weather takes a turn for the better it can be quite chaotic at times.

Major external influences on the business

For our irrigators, water allocations are a concern. While most irrigators are hoping to reach 85 per cent of their total allocation, there are already people chasing extra water knowing that even if allocations reach 85 per cent, they will still struggle to meet their needs. Something creating extra concern is the fact that the price of water is already quite high.

Retail in general is down across the nation as has been well publicised, however, in our region some large civil projects being undertaken which should

bring new opportunities to our area over the next 5 to 10 years.

Next 12 months?

I believe the next 12 months will be quite interesting in retail. If the farmers have a good year, the flow-on effect throughout the community cannot be underestimated. As a retail outlet, we are always looking to introduce the latest and greatest options to save on water and power to our customers, which can only better their bottom line and inevitably build their trust for the future.

VICTORIA



Gary Andrews,
Smart Water
Shop,
Melbourne



Trends this year

The current trend, which has been ongoing for some time, is one where our customers are demanding smart and sustainable irrigation and water management solutions.

2019 compared to previous years

Customers are interested in control systems that can account for water consumption and can be accessed remotely using Bluetooth and the internet. These products are now readily available and cost effective. Equally, water efficient stream rotor nozzles and drip irrigation are highly sought after.

Major external influences on the business

In a word, staff. Having trained staff who can communicate the water efficiency message to customers is essential. In times where the

community is aware of water shortages the demand for irrigation expertise increases.

Next 12 months?

The only negatives on the horizon are economic conditions and a turndown in the construction industry.

WESTERN AUSTRALIA



Stacey Oakley, Great Northern Rural Services, Geraldton

Trends this year

The past 12 months have seen an increase in domestic, commercial and mining water storage requests. The value of our natural resources during long periods of little to no rain is being felt from the coast all the way inland.

2019 compared to previous years

The water industry is now more than ever a 12-month-a-year business. Gone are the times when winter meant a slowdown in enquiries or orders.

Major external influences on the business

The quality of ground water is forcing industries to move to desalination/RO units, spreading bore loads to reduce fatigue. Internet purchasing and tendering remains a big influence on local markets.

Next 12 months?

The market will continue to tighten with overseas imports and retail outlets prepared to fight harder for market share. In the Midwest, steady growth will be maintained.

Mark Jury, Total Eden Busselton



Trends this year

With the new housing market slowing or even showing signs of a slight dip, we have decided to take the opportunities in the increasing demand for domestic service work.

Regionally, there appears to have been an increase in capital expenditure in the agricultural and commercial projects sectors. We also are seeing more money being invested in upgrading and repairing pumping and irrigation systems, especially in the remote monitoring and operating sectors.

2019 compared to previous years

While there has been a gradual upward trend in online shopping for clients who know exactly what they want, the demand for professional advice and troubleshooting remains high. In response to the demand for 24/7 shopping our company has developed an online shopping platform with the goods being sent to their nearest store for pickup. As a retailer, this enables us to engage with the online shopper and offer more of our services.

Major external influences on the business

Climate plays a big part in the domestic retail business. Long, hot and dry summers mean extra pressure on domestic reticulation systems, and these years generally run hand in hand with an increase in sales and service work.

Economic conditions, whether good or bad, are particularly important for our agricultural and commercial customers, and they each drive very different types of sales. Good times provide the customer with an opportunity to expand or upgrade infrastructure while in the tougher times providing good economical savings through efficient use of water and energy are more appropriate. Understanding your customer's business is essential in providing them with the most appropriate solutions to help them make the most of their position.

Next 12 months?

I believe the industry still has a lot of strong growth ahead of it. In an ever-drying climate and with clean water not going to become any cheaper, the domestic and commercial customer will begin to drive the demand for more water-efficient systems.

While the product focus may change, the need for professional advice to make this transition will remain as important as ever. The skilled irrigation retailer will have a strong place in providing this support moving into the future.



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DELIVERING PUMPING SOLUTIONS

Online another arm to the business

In the last few years the retail sector has been subject to many changes, some of which have been a challenge for businesses to manage. One of the most significant challenges to have emerged is online shopping. While the irrigation sector has not been as vulnerable as the personal shopping sector, irrigation retailers have been watching developments and some have taken the step and developed online stores.

Brett Peel from TIS in Brisbane is one of the many retail business owners around Australia that have set up online stores. We asked him about his experiences with the online store he developed for his business in 2014.

Brett explained that the key reason for developing the store was a marketing one.

“We recognised we needed to adapt our sales strategy to meet our market and the increasing reach of the digital economy,” he said.

One of the big issues with anything that goes online is that developing the website is just the beginning of a commitment in terms of time and money. And with online shopping, there are a number of formats, the most effective of which can usually only be identified by research and testing.

“We have several portals that provide us market exposure and access to our products by customers,” said Brett.

TIS has trialled most formats, including eBay, ground up online stores, third party templates and hosting companies.

“Each have their specific advantages regarding ease of set up, cost and adaptability. As an example, we have found that the cookie cutter, online store templates are simpler to begin with but are generally limited in their ability to be customised as customer, product and company needs develop over time. As an ongoing basis we have our in-house team regularly monitoring and maintaining our site,” he said.

In the five years that the store has been active, Brett said that no special trends have emerged in terms of buyers and what they buy e.g. age groups, professionals, amateurs or equipment.

“This isn’t surprising as Australians have a track record of being early adopters of new technology,

so our market and product breakup has been fairly consistent over time,” Brett explained.

Obviously, the most important question, especially considering the online store is now mature, is whether it is important to the business.

According to Brett, it very definitely is.

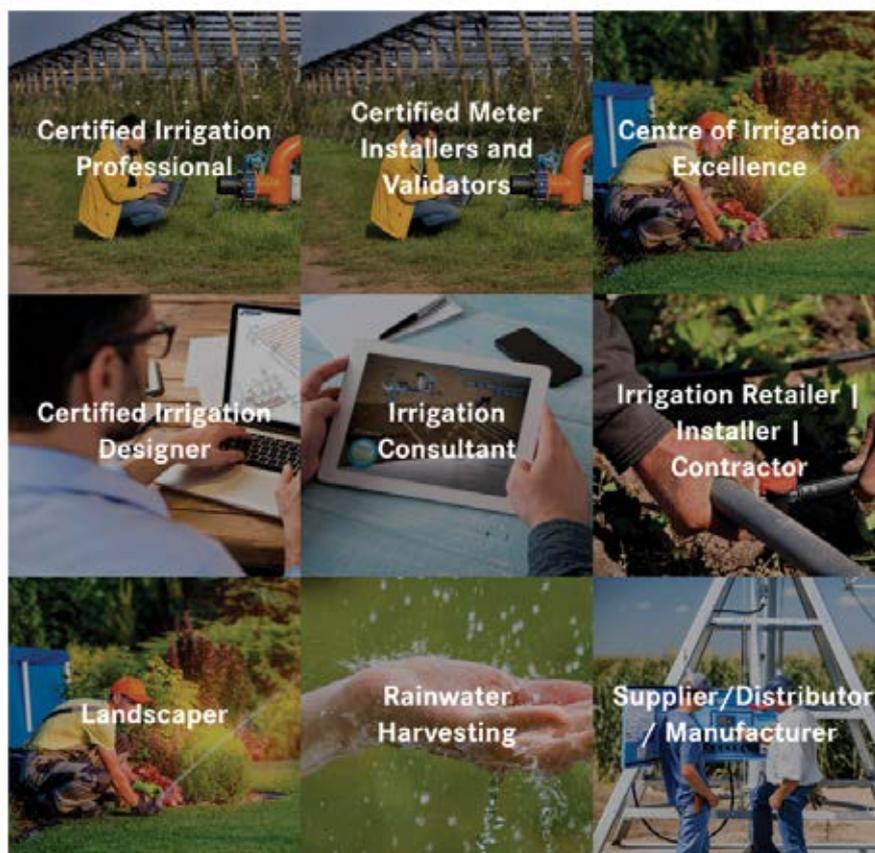
“We have had good, year-on-year growth, which is in line with our expectations,” he said.

And what would he advise retailers who are considering including online to their business?

“Don’t expect to set and forget! The online market is constantly shifting and adapting to these changes is vital.”

Anne Currey, Irrigation Australia

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AUSTRALIAN HYDROGRAPHERS ASSOCIATION JOINS FORCES WITH IRRIGATION AUSTRALIA

One of the activities of Irrigation Australia is to build strategic partnerships with organisations as a way of increasing its ability to lobby and influence policy in irrigation related areas.

In August, CEO Bryan Ward announced that Irrigation Australia had signed a Memorandum of Understanding with the Australian Hydrographers Association (AHA). According to Bryan, the

fact that state governments in eastern Australia in particular are working to strengthen metering standards and regulations will be enhanced by the MoU.

“The two organisations can now work together on mutually beneficial projects, drawing on the expertise of each other and share knowledge and information and promote each other’s certification programs,” he said.

AHA, which provides professional certification to its members, focuses on open-channel systems, while Irrigation Australia concentrates on closed-conduit systems. Under the partnership agreement, professionals who undertake meter installation

and validation from either organisation can elect to complete training and become certified in open-channel or closed-conduit systems, if they meet the necessary requirements and have requisite skills and experience.

“This arrangement does not affect the independence of either association but does benefit financial members of both organisations,” said Bryan. “AHA members can now access Irrigation Australia courses, events and services at member rates, and vice versa.”

In the future, the two organisations will explore joint training opportunities.

A BUSY YEAR FOR CERTIFICATION BOARD

The role of Irrigation Australia’s Certification Board is to oversee our certification program and to ensure that its quality and credibility are maintained. This includes ensuring that certified professionals adhere to the code of conduct, resolving disputes and auditing the processes for issuing, recording and promoting certification.



Gennaro Vellotti, Chair of the Certification Board, provides an update on the Certification Board’s busy year.

This year has been a busy one for the board. Gennaro Vellotti, Chair of the Certification Board, provides an update on recent activities.

- Promotion of certification is an important way of helping clients recognise certified irrigation professionals. The board has created a Certification Marketing Toolkit for certified professionals’ use, which can be downloaded from the Irrigation Australia website under the certification tab, <https://www.irrigationaustralia.com.au/certification/certification-marketing-toolkit?command=logIn>.
- A new certification for a Certified Irrigation Evaluator has been finalised. This certification is for individuals with experience in the industry to be able to evaluate irrigation systems.
- The board is working with government authorities to promote and recommend the

use of certified meter installers and validators. A strong new metering framework to improve the standard and coverage of non-urban water meters across Australia under the Water Reform Action Plan is now in place under the Australian Standard 4747. The framework will be implemented in each State through a staged roll-out over five years. Irrigation Australia offers approved training courses to meet increased demand for certified meter installers. For information on each state’s interim standards that align with the AS4747, go to the Irrigation Australia website, <https://www.irrigationaustralia.com.au/certification/certified-meter-installer-validator>.

- At Irrigation Australia Conference and Exhibition 2018, irrigation industry professionals who had been certified for 20+ years were recognised at a luncheon and certificate ceremony. This is an important achievement for these individuals, and we intend to make this a biennial event at each Irrigation Australia Conference and Exhibition.
- We have been working closely with Irrigation Association in the USA to update our CID exam. This involves metricating (from US units to metric) *Principals of Irrigation*, one of the main textbooks for CID exams. This will allow us to renew and update our exams as well as reduce from three to two the CID number of exams to become certified. This has been a very time-consuming task for the board.
- The board has revised its structure and terms of reference to include a young professional. This was to encourage young professionals to become involved in our industry and to provide the board with a young professional’s views and input in certification. Daniel Rose from HydroPlan is our first young professional member (see interview in next column).

- We have recently also been working on Continued Professional Development (CPD) system to expand some of the additional activities that are required to gain points. As a certified professional you are required to achieve 10 CPD annually to maintain your certifications. The board has been working on simplifying the process and adding activities like online Moodle tests to achieve points.

CERTIFICATION BOARD MEMBERS

Gennaro Vellotti, Netafim. Chair
Peter Brueck, Water Wise Consulting
John Harvie, Irrigation Systems Australia
Jim Phillips, JP Water
Daniel Rose, HydroPlan. Young Professional member
Peter Smith, Sapphire Irrigation Consulting
Geoff Harvey, Irrigation Australia

Young professional joins board



The Certification Board recently welcomed its newest member, Daniel Rose, who is its first Young Professional to be appointed.

The newest member of the Certification Board is Daniel Rose, who works with HydroPlan and is based in Perth. Daniel is the board’s first elected Young Professional member. We spoke with him about his role and what he hopes to achieve on the Certification Board.

Daniel’s irrigation career started in 2009 at a small irrigation shop in Perth’s Northern suburbs, where he was a bit of an allrounder, covering all areas when needed. His diverse role involved supplying irrigation product, providing advice and, frequently, working on



IRRIGATION AUSTRALIA NEWS

sketched plans and “how-tos.” He even spent a few years working in the shop’s commercial pump division.

In 2014 he made the move to HydroPlan as an irrigation design consultant.

“While most of my work is still providing clients with advice and expertise, I have far greater project involvement.

“Some projects I work on start as early as the initial conceptual/feasibility phase, where we discuss with the client their needs, wants and any restrictions that might be in play for a given project. We can also remain involved all the way through to the end of the defects period if need be,” said Daniel.

While he has only been a member of the Certification Board for a couple of months, he said that he is looking forward to helping the team develop initiatives and maintain the framework of standards which help to promote and grow the irrigation industry.

Daniel has experience with the Certification program, having gained his Landscape Turf/Golf accreditation in 2017.

“I applied not long after joining HydroPlan as I believe having the certification is a clear indicator of my level of understanding and expertise in irrigation and gives our clients greater confidence in what we do,” he explained.

What would he say to other members contemplating completing a certification?

Daniel’s answer was simple.

“Don’t wait. The hardest part always is taking that first step and the while the overall process may look daunting, if you are contemplating it then chances are you’ve already got a better-than-fair level of skill and know how. And the people involved are all extremely helpful and accommodating,” he said.

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REGIONAL ROUNDUP

What’s going on in the regions and with membership by Tracy Martin, Irrigation Australia’s National Membership and Regions Manager.

South East Queensland

The regional committee hosted an informal breakfast, site visit, discussion and presentation 12 September at the Doomben Racetrack sponsored by Davey Water Products and Rain Bird Australia for SEQ members and the wider irrigation industry.

Presenters included Ben Chapman of Project Pumps & Irrigation, who was involved in designing the new irrigation system at the track, Ian Lacey from Davey Water Products and Tim Robertson from Rain Bird Australia. Irrigation Australia also took the opportunity to update industry participants on the Irrigation Trade qualification and other professional development news.

Western Australia

The big item on the Western Australia regional committee program was Waterwise Irrigation Expo, held 14 August. For more information on this extremely successful event, read the article on page 28.

Melbourne

The Melbourne Urban Committee meets on the third Tuesday of every month. Members are welcome to attend.

In August, the committee held a field day at the Geelong Botanic Gardens, which was attended by 100+ people. Workshops covered a range of irrigation topics, including how irrigation design affects performance; piping systems; control systems; pumps, filtration and tank systems; system testing; and maintaining an efficient irrigation system.

There was also a tour of the onsite stormwater harvesting and re-use system.



A range of inside and outdoor workshops were a feature of the recent field day at Geelong Botanic Gardens organised by the Melbourne Urban Committee.

South Australia

A number of members in South Australia are looking to reinvigorate the regional committee. In general discussions, it has been agreed that a new committee would be more effective than in the past if smaller sub-committees were organised to deal with specific topics, i.e. rural, urban landscape, training, events and local government/SA Water.

An industry update has been sent to members with information about the sub-committees and asking for nominations. A regional meeting is scheduled for October to plan future activities. Keep an eye on the regional committee news section of the Irrigation Australia website for updates.

Sydney

Sydney members have been approached to rev up the local committee to oversee industry interests, plan activities for NSW members and to be an initial point of contact for Sydney Water on irrigation matters. Nominations for the regional committee have been called. The committee will focus particularly on creating a uniformity standard, helping Sydney Water prepare levels of water use (staggered percentage dam levels) for conservation programs and formulating a dedicated Waterwise sub-committee.

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IRRIGATION AUSTRALIA LANDSCAPE IRRIGATION CONFERENCE

A FIRST-CLASS EVENT

In June this year, Irrigation Australia held its first-ever landscape irrigation conference and exhibition.

The event was a joint activity where Irrigation Australia partnered with the Nursery and Garden Industry, Turf Australia, Landscape Queensland Industries Association and Sports Turf Association Queensland.

According to Irrigation Australia CEO Bryan Ward, the event was right on topic with positive feedback about the range of speakers and quality of their presentations as well as technology on display at the exhibition.

A highlight was the participation of ABC television garden guru Costa Georgiadis.

Costa's key message was about the important role the irrigation industry plays in greening urban areas and how innovative water management solutions can serve several purposes, such as improving the environment and green spaces, managing storm water and increasing community awareness about sustainable water use.

Speakers from landscape industries, the irrigation service sector and water supply companies provided different perspective on topics ranging from large-scale recycled water supply and managing urban run-off through to irrigation system designs for landscape projects and the need to change irrigation regimes and plant species mixes as a result of climate change.

An event like this would not be complete without its exhibition, which allows attendees to follow up on presentations, check out products and services on display and develop commercial relationships. Twenty-seven companies showcased their products and services, and feedback about the number and quality of enquiry was positive.

"This was very much us putting a toe in the water to assess the potential of holding a regular landscape irrigation event and, based on participant and exhibitor response, we are definitely looking to another one in two years' time," Bryan said.

The conference was opened by Minister for Agricultural Industry Development and Fisheries, Hon Mark Furner, representing the Queensland Government.



Costa Georgiadis meets Irrigation Australia staff (l to r) Tracy Martin, Kahla McKinless, Geoff Harvey, Bryan Ward, Costa, Chris Delphin, Paris Lobie and Andres Jaramillo.



The conference was opened by Minister for Agricultural Industry Development and Fisheries, Mark Furner MP, shown here with Bryan Ward (CEO Irrigation Australia) and Andrew Ogden (Chairman Irrigation Australia).



Gardening Australia presenter Costa Georgiadis was an entertaining speaker who had a serious message about the important role the irrigation industry will continue to play in greening urban areas in innovative and sustainable ways.



The exhibition was a valuable opportunity for attendees to find out about equipment and services on display.

URBAN IRRIGATION: CHALLENGES AND OPPORTUNITIES

Michael Smit, Kingspan Water and Energy

Michael Smit attended the Landscape Irrigation Conference and Exhibition and, in this article, captures some of the more thought-provoking ideas about urban irrigation that were presented by speakers.

When looking at urban irrigation, we know that managing the urban water cycle is a very different challenge from managing the natural water cycle. Figure 1 illustrates just how different the urban water cycle is.

One of the key challenges in an urban environment is managing stormwater. The way we currently do this is to connect our roofs and roads directly to our streams and not let stormwater go into the ground. This means that while urban soils are usually dry, there is a LOT of runoff, and this has to be managed. As an indication of this volume and the scale of the issue, houses in Sydney use about 200,000 L each year, but they generate about 300,000 L of stormwater runoff into local creeks.

This is a major problem for our capital cities to manage. Our pattern of urban development, which results in large areas of hard surfaces, creates huge amounts of stormwater that is very damaging to local waterways. One indication of just how important this is, is that urban flooding is emerging as a major issue according to the insurance industry.

Maintaining green space

The other big problem in our cities is that they are getting hot, dusty and dry. As development becomes denser, areas of trees and grass are disappearing. At the same time, we know that green spaces act as natural air conditioners for our cities. Ian Hasselman from the City of Parramatta gave a good talk at the conference about the doubling of very hot days since the 1960s, and explained that 70 per cent of their new residents will not have a backyard, rather they will depend on the council for streets and parks for recreation and urban cooling.

Geoff Connellan talked about urban street trees in Melbourne needing 60,000 L of water annually to develop a canopy suitable for significant cooling benefits. Only about 7,000 L of this requirement, however, might be available as local stormwater. All capital cities already have significant numbers of street trees and Brisbane recently planted 2 million more. If each tree as a guide needs around 60,000 L a year, the big question is, where is this water going to come from?

We know that some councils at the Victorian Stormwater Conference earlier this year reported that they were requiring installation of rainwater tanks on each new building as part of their planning approvals to manage the stormwater impacts on site. A rainwater tank and permeable pavement and rain gardens are very effective at taking some of the stormwater out of the system at the source, before it becomes a problem.

According to Engineers Australia, rainwater harvesting is an effective design solution for controlling peak discharge, improving water quality and harvesting stormwater. There is an interesting catch, however. For rainwater tanks to be effective in managing stormwater, they need to be mostly empty when it rains, therefore captured rainwater needs to be used.

Integrated water management

Is this a good example of integrated water management? Could we use the valuable rain water we have captured to fix a stormwater problem as a source of water for greening our cities? The answer is yes, although there are some practical management challenges to be managed in an urban context.

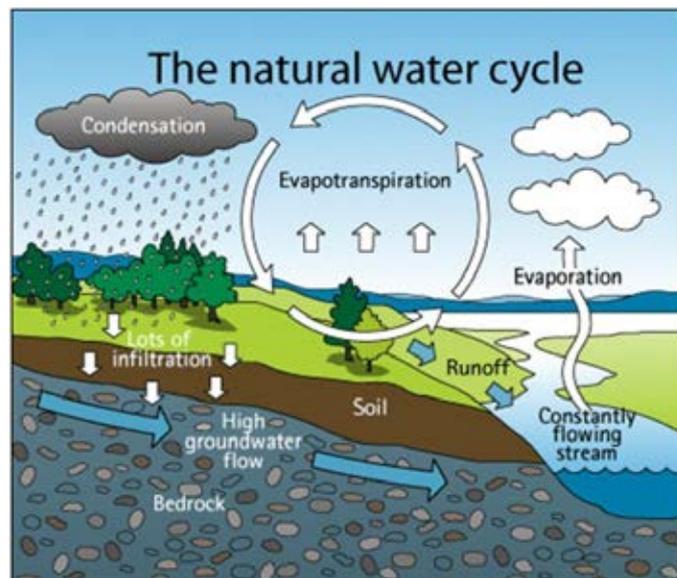
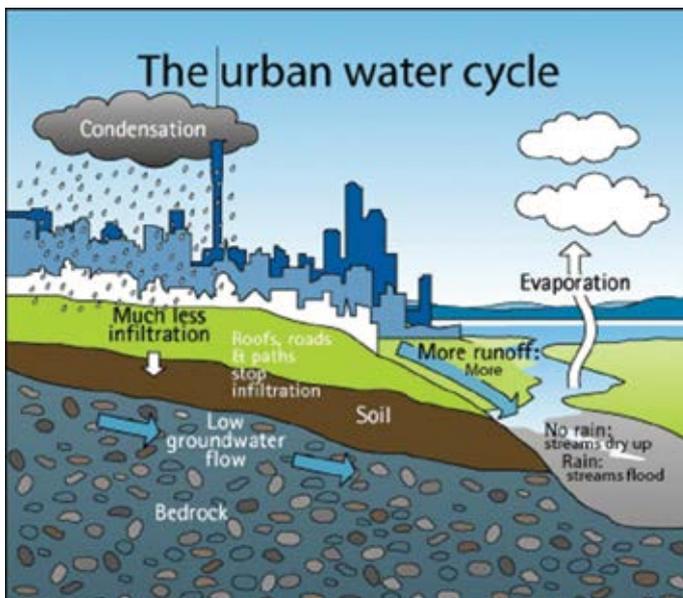


Figure 1. An abundance of hard surfaces such as pavements, roofs and roads, is just one aspect of cities that result in the urban water cycle being very different from the natural cycle.



Urban development is characterised by large areas of hard surfaces, something that has significant consequences for stormwater impacts (Google maps 14 June 2019)

This is irrigation at a very different scale to rural irrigation. It is irrigation at the lot scale, capturing rainwater which has low treatment costs and using it locally for plants on site or on the nature strip. Michael also believes that in future we will need to change our planning rules to require more green spaces on each new development.

While it does rain in the dry season, it doesn't rain as much, and this is when plants and trees need the most water. Geoff Connellan noted some very interesting research about the benefits of water banking - storing water deep in the soil during the wet season for use by plants in the dry season - at the Royal Botanic Gardens in Melbourne. This meant that irrigating even in winter and in spring (in Melbourne this is the "wet" season) can be useful.

A key benefit of the urban context is that we have a dual water supply, i.e. we can use other sources such as recycled water or mains water to make up the shortfall. This combination will still save tens of billions of litres of water at the same time as improving our local waterways and reducing flooding risk and starting the long process of cooling, not heating, our cities.



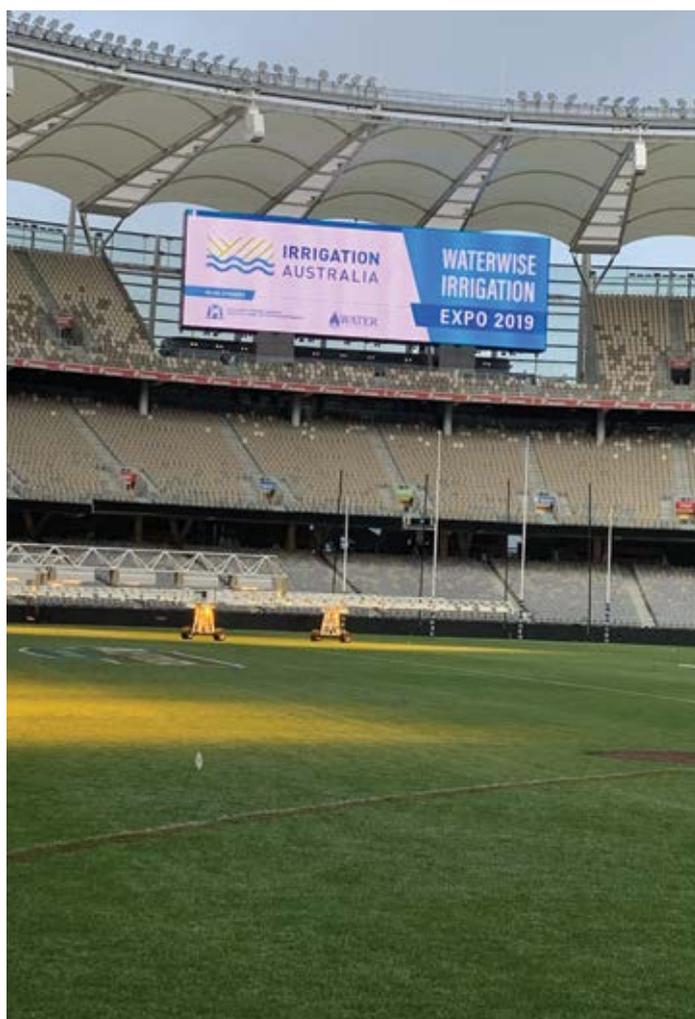
WATERWISE IRRIGATION EXPO CREATES BUZZ IN WA

In August, the Western Australia region held its biennial Waterwise Irrigation Expo, which has been a feature of the irrigation calendar since 2007.

This year's event was the biggest and most successful to date with 33 organisations and businesses showcasing their products and services and a busy schedule of presentations keeping the 150+ participants interested.

A highlight for all participants was the opportunity to visit Optus Stadium and listen to Jarrod Hill from SportEng explain the challenges of designing and building this world class facility and see the irrigation system in operation. During his talk, Jarrod reinforced the importance of uniformity and efficiency, something that was to be repeated by other presenters throughout the day.

In support of the key messages of water efficiency and education, the WA Minister for Water; Fisheries; Forestry; Innovation and ICT; Science, Dave Kelly MBA, opened the event and announced a rebate for the purchase and programming of eligible smart irrigation controllers and components by members of the Waterwise Irrigation Programs.



The opportunity to step onto the oval at Optus Stadium and learn about its design and installation was one not to be missed.



Irrigation Australia Chair Andrew Ogden welcomes Dave Kelly, WA Minister for Water; Fisheries; Forestry; Innovation and ICT; Science to Waterwise.



Thirty-three businesses and organisations took up the opportunity to exhibit their products and services at the Waterwise Irrigation Expo 2019.

With an event like Waterwise, what matters is whether it lives up to the expectations of both participants and exhibitors. According to Irrigation Australia Chair Andrew Ogden, the feedback from attendees, stakeholders and exhibitors has been consistently positive, so congratulations to the regional committee and Irrigation Australia staff members Tracy Martin and Ellen Slobe, who both spent countless hours working to ensure that it was a huge success.

A GREAT SHOW

Just some of the feedback about Waterwise Irrigation Expo 2019.

Thanks for an epic, awesome, superstar filled, fully sick location and content at the expo yesterday. I'm glad it was so well attended, and the seminars were very insightful and interesting. Rotation format worked a treat.

You now have a huge problem – how to better this year's effort. Well done

It was a very successful event especially for us and good interaction with the consumers, councils, landscapers etc. Well done by you guys, and we certainly would join again.

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LEARNING UNDERPINS IRRIGATION CAREERS

Irrigation Australia recently caught up with two professionals who work in the industry in Victoria – Sharlene Maple and Jessica MacDonald. Both Sharlene and Jessica recently completed their Certificate III in Irrigation. Learning and continuing to develop their skills and knowledge underpin the careers of both these industry professionals.

Professional development a priority for Sharlene

Sharlene, who works for SmartWater in Melbourne, has enjoyed outdoor work since she began her career in the ground maintenance industry almost 15 years ago. Professional development has always been a priority for her, and as well as her Certificate III in Irrigation, she also has a Certificate IV in frontline management.

Her interest in irrigation was stimulated when she was involved in landscaping for five years.

“We were working on display homes for Metricon and Simmonds and took them from blank canvases into beautiful gardens,” she said.

From there Sharlene progressed to working with a housing construction and improvement company in the garden/nursery areas where she designed gardens and provided recommendations on the use of plants and watering systems.

Not content with the garden scene in Melbourne, she moved to the warmer and wetter climate of Darwin where she worked at a resort as grounds and maintenance officer. But the call of home was strong, and she returned to Melbourne and to SmartWater, where she now works in sales.

Her commitment to professional development remains as strong as ever, which is why she decided to complete her Certificate III.

“My aim is to continue learning more about the industry and irrigation as I go,” she said.

Sharlene explained why she joined the irrigation industry and why professional development is important to her.

“For a few years it was just lay the irrigation system out, then one day it twiggged, and I thought



Sharlene Maple recently completed her Cert III in Irrigation through Irrigation Australia. The one-week course included theory and practical activities such as completing catch can tests.

I wouldn't mind learning more in-depth about irrigation, not just installation,” she said.

This prompted Sharlene to look more into the technical aspects of irrigation and landscape management and she became interested in biodiversity and ecological systems and the impact of irrigation on plants and crops, as well as on recreation areas such as parks and sports grounds.

“Add to this the impact of climate and geology, and I realised that all these things affect how and when we apply irrigation and how we design our systems. It became more interesting the further I looked into it,” she said.

Sharlene has taken her interest, training and experience in irrigation installation and design and now works at SmartWater in retail irrigations sales.

“I like to get to know the customer and what they are looking to achieve, which means I do ask a lot of questions to help determine what sort of irrigation system will work and what the appropriate design would be.

“I enjoy knowing that I can use my knowledge to teach and inform clients. I not only suggest how they should design the irrigation system, but I also use information to help show the benefits, including saving water, and to get the results the client requires,” she explained.

Earlier this year Sharlene completed her Cert III in Irrigation through a one-week class held by Irrigation Australia. This included practical

exercises and face-to-face sessions with guest presenters from different irrigation and pump industries.

“I found that in the week we covered a lot and the information will be valuable in furthering our careers and improving our skills in the industry,” she said.

Sharlene explained that her reason for doing the Cert III was to improve her understanding of how irrigation affects the environment, including biodiversity and ecological development.

“The environment is changing rapidly so I think it is important that I understand how it all works. I can apply my skills and knowledge to develop an irrigation system that can benefit the environment as well as provide beautiful parks and sporting grounds,” she said.

While Sharlene currently works in an urban environment, she is also interested in agriculture and would love to expand her knowledge if the opportunity came up.

And her message for anyone thinking about committing to a professional development program?

“For people wanting to follow a career in the irrigation industry, look beyond thinking irrigation is ‘just a watering system’.

“Take the time and look outside the box and see what our irrigation provides for today's society, and how we all benefit it from it.”

Irrigation a long-term profession

Jessica MacDonald has worked for almost eighteen months for Ecostream Water Management, based in Mornington in Melbourne's south. The company does commercial and domestic designs and installations all over Victoria. When not in the field installing systems, Jessica enjoys time with her family in Inverloch, where she makes the most of the laid-back coastal lifestyle away from work.

Irrigation Australia spoke with her about her perspectives on the industry and why she completed the Cert III.



Jessica MacDonald is enthusiastic about her career in the irrigation industry and enjoys the support of her small team with Ecostream Water Management.

IA. Why did you decide to join the Irrigation industry?

Jessica. I decided to pursue a career in the irrigation industry as I was keen to become a valuable and long-term contributor to a growing industry. I believe irrigation will become a highly

sought-after trade in the future particularly to do with sustainability and using water wisely.

IA. What do you enjoy most about your job?

Jessica. I mainly install irrigation systems and I always enjoy the variety of location, systems and duties involved. I enjoy travelling and being outdoors and it has the benefit of allowing me to get to know Victoria as I am originally from Tasmania and moved here a few years ago. I enjoy working with a variety of people from many different trades from site to site as well as being a part of a close-knit, supportive and encouraging team at Ecostream Water Management. Working in such environments and enjoying it daily has enabled me to relax and learn about the trade easier through on-the-job experiences.

IA. How did you complete your Certificate III?

Jessica. I completed my Certificate III through direct training from Irrigation Australia via two four-day training blocks in Ringwood in 2018. This included talks from specialists and suppliers in the industry, practical lessons offsite at local businesses involving pumps, commercial maintenance and soil identification as well as in class activities such as irrigation design. This was followed up by online questionnaires which I completed at my own pace.

IA. Why did you decide to do the Certificate III?

Jessica. I was keen to do the Certificate III to build on and improve on my skills in irrigation. I particularly enjoyed learning about hydraulics and wiring because it has given me more of an understanding about why things are installed certain ways. I also found it helpful meeting others who are working in different areas in the industry such as retail and agriculture.

IA. What would you say to other people thinking about doing an irrigation qualification?

Jessica. I would tell others who were considering doing an irrigation qualification to just go for it. The ability to learn from those who are leaders in the industry is invaluable, and I am looking forward to continuing my studies in both the short- and long-term future.

Irrigation Australia has irrigation training covered

Thinking about updating or adding to your skills and knowledge in irrigation? Check out Irrigation Australia's training courses, which include:

- Centre Pivot/Lateral Move (CPLM)
- Introduction to Irrigation (Urban and Agriculture)
- Certificates III and IV in Irrigation
- Irrigation Drip
- Irrigation Efficiency
- Irrigation Pumps and Systems
- Meter Validation and Installation (CMI)
- Basics of Wiring and Electrical Troubleshooting
- Urban Irrigation Design
- Commercial Irrigation Design
- IrriCAD Design.

Information

For information about training and professional development go to website <https://www.coie.com.au/> or contact Kahla McKinless, email kahla.mckinless@irrigation.org.au phone 07 3517 4000.

PRIMING IRRIGATION INDUSTRY TRAINING

Grundfos is a familiar name immediately associated with pumps and pumping by everyone in the irrigation industry.

The company was founded in 1945 in Denmark and now operates in 83 countries, including Australia, where its head office is in Adelaide.

Grundfos has long had a commitment to training and developing the skills and knowledge of its staff and those who specify, install and use their equipment.

It is a valued sponsor of Irrigation Australia's Centre of Irrigation Excellence, and recently

developed its Ecademy, an online knowledge base designed for irrigation and water. Users can choose a topic, complete it and do a quiz to improve their technical knowledge in things pump-related. Topics include basic hydraulics, pump principles, wastewater drainage and pumping, submersible pumps and systems and solar pumping systems.

Boosting its credentials in professional development even further, Grundfos now has a new training facility in Adelaide. In August, participants in a Certificate III in Irrigation course run by Irrigation Australia were able to use the facility.

According to Irrigation Australia National Training Manager Geoff Harvey, it was an excellent

venue for the 4-day course with state-of-the-art equipment and facilities.



Participants in Irrigation Australia's Certificate III in Irrigation course try out Grundfos's new training room in Adelaide.

NRAR AUDITORS IDENTIFY BREACHES OF WATER ACT

In its June 2019 Budget, the NSW Government increased funding for the Natural Resources Access Regulator (NRAR), which is charged with ensuring compliance with water legislation.

The extra \$5.1m funding will allow the regulator to double the number of staff inspecting properties and assessing compliance with water users' licences and the Water Management Act 2000. As a result, the initial complement of 73 officers has been increased to 145, most of whom are on the front line.

The NRAR hotline had received up to 12 calls a day — 4000 in total — up until June 2019 from people dobbing in alleged water theft. At the end of June, there had been 773 breach allegations reported.

Breaches vary from small scale to significant ones, as demonstrated in July 2019, when the owner of a vineyard on the NSW-Victorian border pleaded guilty in the Land and Environment Court to unlawfully taking 1378 ML of water from the Murray River between April 2016 and March 2019.

SURVEY: AUSTRALIANS WILLING TO PAY LEVY TO REALLOCATE WATER TO ABORIGINAL PEOPLE

The June 2019 edition of US journal *Water Resources Research* reported on a survey of about 3,000 Australians that found almost 70 per cent support for the idea of reallocating a small amount of water from irrigators to Aboriginal communities. The research was done by Griffith University and the University of Tasmania.

Aboriginal native title does not extend to water, but the research estimated households are willing to pay \$21.78 in a one-off payment on a water bill to see a fairer distribution of water.

The total value of what households in the Murray-Darling Basin were willing to pay was \$74.5 million, which is almost double a recent government commitment to fund the acquisition of entitlements for Aboriginal nations of this basin. Those who took part in the survey did not have a strong preference for how Aboriginal communities should use any reallocated water.

CURRENT DROUGHT IN MDB OFFICIALLY WORST ON RECORD

The drought affecting the Murray-Darling Basin (MDB) is now the worst on record according to the Bureau of Meteorology (BOM).

Based on rainfall records that go back to the early 1900s, the severity of this drought has now exceeded

that of the Federation Drought, the WWII drought and the Millennium drought.

One impact of this low rainfall is very low levels of run-off into the system, which have in turn affected river volumes and recharge into aquifers and the subsoil.

And unfortunately, the BOM is reporting that there is no immediate end to the big dry in sight.

The bureau has also noted that while the MDB has been in the publicity spotlight, much of the rest of Australia is also in drought. While there was good summer rain in western Queensland, since the start of 2017 it has been very dry in most other areas of the nation.

Source: *Farmonline newsletter*, 18 July 2019

NSW METERING GUIDANCE TOOL

The NSW Department of Industry has created an online tool to help water users determine if they are required to comply with the current metering framework. It consists of a series of short questions and takes less than 5 minutes to complete.

The website that houses the tool includes information about the NSW non-urban water metering framework, including the regulation and policy. To access the tool go to website www.industry.nsw.gov.au/water-reform/metering-framework



STBIFM CLOSES IN NSW

After nine funding rounds since 2012 the Sustaining the New South Wales Basin Irrigated Farm Modernisation (STBIFM) program ceased operations on 30 June 2019.

According to NSW DPI, in its seven years of operation, \$121 million has been invested in

irrigation infrastructure modernisation on farms in the Northern NSW Murray-Darling Basin. This involved 111 separate projects in partnership with 78 individual irrigators.

The Australian Government provided funding of \$84 million through the NSW Department of Primary Industries, with a further \$37 million invested by irrigator partners.

STBIFM funded irrigation improvements have recovered water savings totalling 33.9 GL, about two thirds or 23.3 GL of which have been transferred as water entitlement to the Commonwealth. The remaining 10.6 GL have been kept on farms to boost agricultural production.

MDBA PROBE BEGINS

In August the Australian Competition and Consumer Commission began its inquiry into water-trading markets in the Murray-Darling Basin.

As a formal inquiry under the Competition and Consumer Act 2010, the ACCC will have access to compulsory information gathering powers for a thorough examination of competition and transparency issues in the markets.

"This inquiry gives us the ability to seek information from a wide range of sources. This will help us form a clear picture of water markets in the Murray-Darling Basin," said ACCC Deputy Chair Mick Keogh.

The ACCC will also engage closely with other bodies with roles in relation to the Murray-Darling Basin, including the Department of Agriculture, the Murray-Darling Basin Authority, the Productivity Commission, the Bureau of Meteorology and the relevant government departments and agencies in the Basin states.

Matters to be considered by the inquiry will include:

- market trends since 2012, including the demand for water, changes in the location where water is used, the quantity of water traded, water availability, water users and their communities, development of new trading products, and the number of participants and sectors participating in the water markets
- the role of carryover allocation practices in water markets
- the role and practices of market participants, including water brokers, water exchanges, investment funds and significant traders of water allocations and entitlements
- the availability to the public of information on water market activities and tradeable water right holdings

- the timeliness, accuracy, and completeness of public information released on water market activities and tradeable water right holdings, including true trade price reporting and the types of trade (for example, immediate purchases, forward contracts, leases)
- barriers to entry, expansion and exit, including transaction costs
- the management of constraints on the storage or delivery of water, including adjustments made to give effect to trades and intervalley transfers.

\$1.5 BILLION WATER EFFICIENCY PROGRAM NOW OPEN

The Australian Government announced in September that its \$1.5 billion Water Efficiency Program is now open with eligible participants being able to register their project proposals directly or through a delivery partner.

The program targets water-saving projects across the Murray–Darling Basin under the Department of Agriculture’s newly-relaunched Water Efficiency Program.

The program will fund water saving projects by agricultural businesses, as well as water infrastructure providers, local governments and councils, industries, property developers and public utilities. All projects must deliver a neutral or positive economic outcome to communities.

The program will fund water saving projects by agricultural businesses, as well as water infrastructure providers, local governments and councils, industries, property developers and public utilities.

Applicants must be either permanent water entitlement holders in the Basin, or water users in the case of towns or industries in the Basin and looking to modernise their water infrastructure

or technology, whether urban, industrial or agricultural.

Successful applicants will receive funding up to 1.75 times the market value of the water they save.

For information go to website <http://www.agriculture.gov.au/water/mdb/programs/basin-wide/water-efficiency>



AROUND INDUSTRY

AWARD WINNING PARTNERSHIP RESTORES FLOODPLAINS IN THE RENMARK IRRIGATION DISTRICT

Floodplains across Renmark in South Australia will continue to get a helping hand under a five-year extension of a landmark Partnership Agreement between the Commonwealth Environmental Water Holder and the Renmark Irrigation Trust.

This agreement was recognised for excellence in innovation at the Water Industry Alliance’s 2019 Smart Water Awards, held in Adelaide in June.

The first of its kind, the partnership (formed in 2016) allows delivery of Commonwealth water for the environment to floodplains in the Renmark area using the Renmark Irrigation Trust’s irrigation infrastructure.

The water is restoring areas affected by salt from rising water tables, caused by past irrigation practices. The water is helping important native vegetation such as the iconic river red gum, and black box trees to survive the drought. These trees provide habitat for our native birds, including the threatened Regent parrot.

Under the partnership water is typically delivered to the environment during the irrigation off-season. This helps maintain irrigation infrastructure, flushing pipes and reducing water delivery costs for customers.

Commonwealth Environmental Water Holder Jody Swirepik said the agreement represents a unique opportunity to use irrigation infrastructure while delivering water for both the community and environmental outcomes.

“Boosting the health of our floodplains is showcasing the great work of the Renmark Irrigation Trust while building an innovative, environmentally-

responsible culture within the community and providing flow on benefits for recreation and tourism,” she said.

Humphrey Howie, Chairperson of the Renmark Irrigation Trust Environmental Watering Committee, said that the agreement demonstrates Renmark irrigators are seeking to be proactive and responsible environmental stewards.



Water Industry Alliance’s 2019 Smart Water Awards (L to R): Jody Swirepik, Commonwealth Environmental Water Holder, Humphrey Howie, Chairperson of the Renmark Irrigation Trust Environmental Watering Committee, Rosalie Auricht, General Manager Renmark Irrigation Trust, Michelle Campbell, Local Engagement Officer, Commonwealth Environmental Water Office.



ACCURATE METERING THE MEASURE OF CONFIDENCE IN MURRAY-DARLING WATER USE

The Murray–Darling Basin Authority (MDBA) is encouraging water users to check a list of approved water meters to ensure the meters they buy are appropriate and fit for purpose when taking water in the Murray–Darling Basin.

The head of the MDBA's Office of Compliance, Brent Williams, said a list of 'pattern approved' meters had been developed to help irrigators choose the right water meter for their circumstances.

A list of pattern-approved meters was released in May this year. It was the result of working with testing laboratories and meter manufacturers to set a timetable for delivering a comprehensive range of approved meters.

"Given the number and diversity of meters required in the Basin, we expect manufacturers to expand the list of meters with potential to be pattern approved in the near future," he said.

The MDBA has revised the list of pattern-approved meters to include information provided by the New South Wales, Victorian, Queensland and South Australian governments about the indicative metering requirements of water users in each state. The information identifies the need for a significant growth in meter installations over the next decade.

As at August 2019, there were no pattern approved open channel meters although two were being assessed – the Accusonic 8510+ Multiple Path Transit-Time Flowmeter and the Rubicon SlipMeter.

Information

The list of pattern approved meters can also be found at the Australia website under the Certification ~ Certified Meter Installer menu.

More information about MDBA compliance and enforcement activities as the water use regulator in the Murray–Darling Basin is available at mdba.gov.au.

TABLE. PATTERN APPROVED CLOSED CONDUIT METERS

Certificate of Approval Number	Meter model	Approved sizes (DN = internal pipe diameter in millimetres)	Approved maximum continuous flowrates (Q3)
PATTERN APPROVED			
14/3/21	Krohne Waterflux 3070	DN25 – DN600	10 m ³ /h – 6,300 m ³ /h
14/3/24	Siemens MAG8000	DN50 – DN1200	63 m ³ /h – 12,500 m ³ /h
14/3/29	Arad Octave DN50	DN50 – DN200	40 m ³ /h – 400 m ³ /h
14/3/30	ABB AquaMaster3 FEV2	DN40 – DN200	40 m ³ /h – 1,000 m ³ /h
14/3/32	Aquamonix / Pentair I500	DN50 – DN600 Provisional approval: DN700 – DN1035	36 m ³ /h – 7027 m ³ /h
14/3/34	Sensus WP-Dynamic	DN40 – DN400	25 m ³ /h – 2,000 m ³ /h
14/3/36	Euromag MUT 2200 EL	DN40 – DN1000	25 m ³ /h – 3,600 m ³ /h
P14/3/42	Rubicon Sonaray Pipe Meter	Provisional approval: DN600	42 m ³ /h – 1313 m ³ /h
P14/3/44	Arad WSTsb	Provisional approval: DN50 – DN300	63 m ³ /h – 1,000 m ³ /h
METERS BEING CONSIDERED FOR PATTERN APPROVAL			
	MACE AgriFlo XCi	not provided	not provided
	Flexim F501IP with K Transducers	DN100 – DN2400	Transit time clamp-on ultrasonics have a very large turndown, and are not limited by flow rate
	Krohne Optiflux 2300	DN25 - DN1800	16 m ³ /h – 25,000 m ³ /h
	ABB AquaMaster4	DN40 – DN600	not provided
	Siemens MAG5100W (Mains powered)	DN50 – DN2000	63 m ³ /h – 40,000 m ³ /h
	Bermad / Euromag MUT 2200 EL	DN600 - DN1000	not provided
	Arad Octave	DN250 - DN300	1,000 m ³ /h – 1,000 m ³ /h
	HR Products Multijet MTEX	DN15 – DN50	108 m ³ /h – 108,000 m ³ /h
	HR Products Woltman LXLG	DN50 – DN300	108,000 m ³ /h
	HR Products Woltman paddle wheel PW	DN50 – DN200	5,760 m ³ /h – 4,320,000 m ³ /h
	Aquamonix/Pentair I500	DN1035 – DN1500	8,640 m ³ /h – 2,880,000 m ³ /h

Note. Some Q3 units have been converted to cubic meters per hour (m³/h) for consistency.

BUSINESS

ATO UNCOVERS SMALL BUSINESS TAX GAP

In August this year, Australian Taxation Office (ATO) released the results of its research into measuring Australia's small business tax gap. The tax gap is an estimate of the difference between tax actually collected and the amount which would be collected if every firm was fully compliant with the law.

Based on this research, the ATO said that Australia's small business community failed to pay \$11.1 billion in income tax obligations in 2015-16, with \$7 billion (64 per cent) of this unpaid tax tied to black economy activity.

Hiding income, exaggerating expenses and operating outside the system are all considered to be black economy behaviours, and businesses doing the wrong thing are about to attract the full attention of the ATO. The economic cost of the black economy is estimated to be as high as \$50 billion a year.

As a result, it has alerted small businesses that it will be increasing its enforcement efforts, which include banning sales suppression software and launching a dob-in-a-business tip-off hotline.

While identifying the issue of the tax gap, the ATO also acknowledged that most businesses are doing the right thing, with its research finding 90 per cent of income tax paid by small businesses is contributed voluntarily.

Superannuation guarantee compliance

The ATO has also said it will be checking on and sending warnings to businesses not complying with their superannuation guarantee obligations.

Something that is making it easier to identify businesses not doing the right thing with superannuation is the growing use of data matching and analytic technologies in the tax office. This is set to increase with single touch payroll (STP) reporting

As well, mobile "strike teams" are being deployed by the ATO as part of its increased enforcement efforts, with close to 10,000 businesses across the country have been visited in the ongoing crackdown over the last year.

In the next three years 30,000 more firms will be getting a visit from ATO in a program being rolled out alongside broader community engagement efforts.

Single Touch Payroll – are you on board?

Time is running out for small employers to have implemented STP, with the transition period set to end 30 September. The ATO recommends the following steps to get started:

- If you already use payroll software, check to see if it offers STP reporting by talking to your software provider or viewing their website.
- If you don't use payroll software, you can choose an STP-ready solution or talk to your tax professional for advice on the best solution for your business.
- If you use a registered tax or BAS agent, you can ask them to report through an STP-ready payroll solution on your behalf.
- If you have up to four employees, you can choose a low-cost STP solution. Find out more at ato.gov.au/STPsolutions.

Note. This information was compiled from information on the ATO website www.ato.gov.au and Smart Company newsletter, www.smartcompany.com.au.

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SYDNEY 2020

Sydney 2020 has well and truly been the focus of the Australian committee's energies, and the second announcement was made official during the ICID Bali Conference (1 to 7 September 2019).

The event website is live, the programs for both the Irrigation Australia Conference and the international conference are being developed and a call for papers will go out in early 2020. Why not get in early and register for the conference now through the website <https://eew.eventsair.com/icid2020/eoi/Site/Register>.

Conference committees have been established for the following areas:

- Program Management and Abstract Panel (Australian Conference)
- Program Management and Abstract Panel (ICID Conference)
- Technical Tours
- Young Professionals Program
- Partner Tours
- Media Communications and Marketing
- Student Awards/Scholarships
- Social Program
- Finance Committee.

A number of major industry exhibitors have already committed to the exhibition, which promises to be the biggest and best showcase yet of irrigation technology and services from around the world.

For information about Irrigation Australia 2020 Conference and Exhibition and the ICID Congress, go to website <https://www.icid2020.com.au/>



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IMPORTANT DATES

DATE	PLACE	DETAILS
2 – 4 October 2019	Valencia, Spain	Water and Society 2019: 5th International Conference on Water and Society. Theme is Invention of new significant tool for sustainable growth in soil, plant and natural resources on earth. Contact Jack Watson, E: socialscience@brainstromingmeetings.com , W: https://soilscience.insightconferences.com/
16 – 19 March 2020	Marrakech, Morocco	5th African Regional Conference on Irrigation and Drainage (ARCID). Theme is sustainable Management of irrigation for improved resilience of agriculture in Africa. W: http://5arcid.ma/
22 – 28 September 2020	Sydney, Australia	24th ICID International Congress and 71st IEC Meeting. For more info E: info@irrigation.org.au , W: http://www.icid2020.com.au

IN THE NEXT ISSUE

The **Summer 2019** issue of *Irrigation Australia Journal* will feature:

EDITORIAL

- > Pumps and pumping, including auditing and energy sources such as solar, diesel, hybrid
- > Digital technology

ADVERTISING FEATURES

- > Annual pumps and pumping feature

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WATER USE IN THE MDB UNDER THE SPOTLIGHT

Lately it appears that nearly every week brings another story about the tenuous nature of water supply in the Murray-Darling Basin. This is at least in part because of the worst drought in the last century imposing considerable demands on the water resource from water users such as towns and cities, agriculture and mining, revealing weaknesses in the system.

Two recent reports highlight some of the issues – a report by Aither into horticulture demand for water in the Murray and a draft review of water management in the Barwon-Darling by the New South Wales Natural Resources Commission.

Demand for water in the River Murray

The new independent report by Aither analyses water supply scenarios and new estimates of current and future horticulture demand with a focus on the lower Murray region.

Aither estimate that current horticultural water demand from tree plantings like grapes, fruit and nuts, including almonds, in the southern Murray-Darling Basin is 1,230 GL per year and will grow to 1,400 GL once all current plantings reach full maturity. This is around 55 per cent higher than recent estimates by the Australian Bureau of Statistics.

During periods of extreme dry water availability (like a repeat of the worst year of the Millennium drought), horticultural water demand will be similar to all surface water that may be allocated for

productive use in that year. If horticulture manages to meet this demand by buying water on the market, there would be little water left to supply other irrigated industries, and water market prices could increase (see figure).

The report highlights a challenge in the future for policy makers and water managers, especially in very dry times, when there will be vigorous competition for whatever water allocation is available. Victoria Department of Environment, Land, Water and Planning outlines potential issues for existing irrigators, investors and policy makers as follows:

For **existing irrigated agricultural enterprises**, it is likely that it will become harder for horticulture businesses and all other irrigated agriculture water industries to meet their demands in dry to average years if they rely on the allocation market. This could potentially lead to higher water prices in the future, particularly in dry years, as well as loss of production of horticultural plantings. These irrigators will need to manage the risks of water availability by using tools like carryover and trade, as well as considering the likely cost of water as an input to their business.

For **potential investors** in new irrigated horticulture developments, planning and investigating water supply options are crucial. Investors will need to understand the water supply demand balance and consider their options to secure water under different seasonal conditions.

For **policy makers** it is important that they are aware of this shift in water use and what it will mean for demand, any further environmental water recovery in the southern Murray-Darling Basin and in any future water market reform. This is particularly the case in the context of climate change.

Barwon-Darling draft report released

The NSW Natural Resources Commission (NRC) recently released its draft recommendations on the Water Sharing Plan for the Barwon -Darling Unregulated and Alluvial Water Sources 2012. It argued that an intense drought, significant volumes of upstream water extractions, an apparent climate shift and the rules within the plan have all contributed to insufficient ecological, social and agricultural outcomes in Barwon-Darling.

The NRC recognises the NSW Department of Industry has undertaken significant and commendable reform since 2017, however, steps to improve water management need to be accelerated and further extended.

The review identified key issues that have particularly affected water management under the plan, including:

- the lack of specific ecological targets
- cease to pump rules based on incomplete ecological data
- the rules allowing increased volume and rate of extractions of water in low flows (A class licenses) and allowance to take “imminent flows”
- the lack of ability to use held environmental water for environmental purposes
- the failure to introduce individual daily extraction and total daily extraction limits
- the failure to allocate water in line with Native Title.

The final report was delivered to the Minister for Water, the Hon Melinda Pavey in early September 2019.

To download the report, go to website <https://www.nrc.nsw.gov.au/2018-2019-wsp-reviews>.

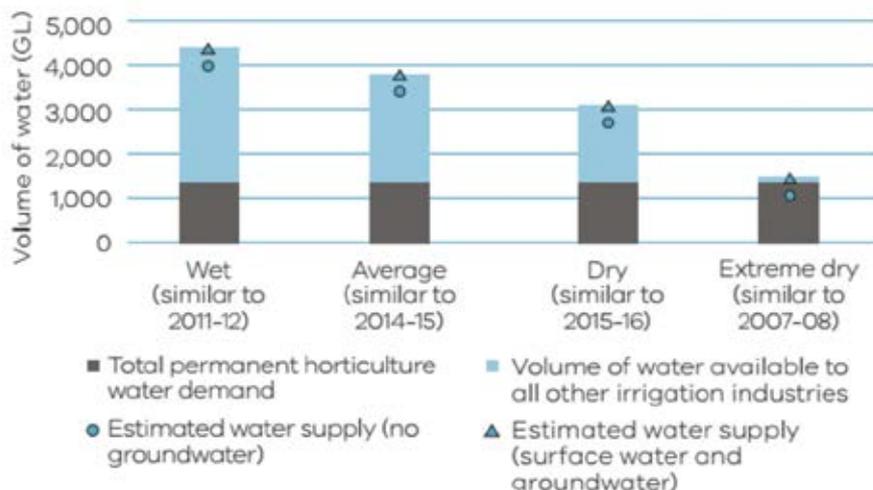


Figure. Water availability scenarios and baseline permanent horticulture water demand (at full maturity) - connected Murray region. Source: Factsheet *Water supply and demand: An assessment of water availability and horticulture water demand in the southern Murray-Darling Basin*, State of Victoria Department of Environment, Land, Water and Planning 2019

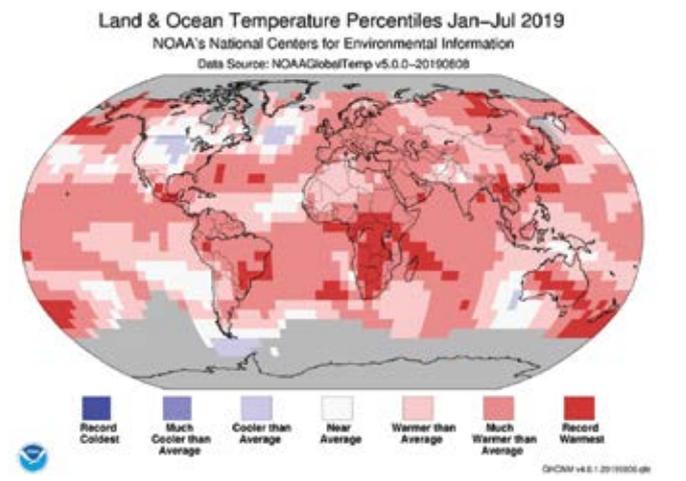
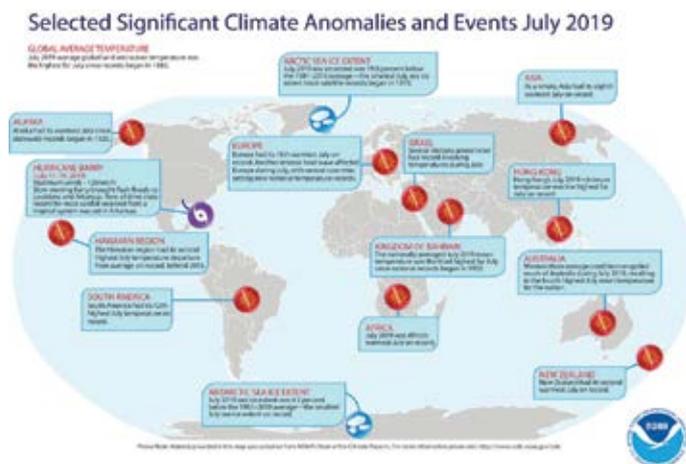


JULY SETS CLIMATE HEAT RECORD

The monthly report for July 2019 from the National Oceanic and Atmospheric Administration (NOAA) in the United States provides a snapshot of temperatures across the globe. In short, it shows that the average temperature this July across global land and sea surfaces was 0.95°C warmer than the 20th century average of 15.8°C.

This is a new record, overtaking the previous record in July 2016, making July this year the hottest month on record. The dataset NOAA uses extends back to 1880.

As well, according to the data, the five hottest Julys occurred in the last five years, and the top 10 have all occurred since 1998. Longer term, this July also marked the 43rd year in a row where July had global temperatures above the 20th century average. In fact, there hasn't been a month with global temperatures below average since January 1985.



With half of 2019 now gone, NOAA also looked at temperatures for the first six months of the year. Between January and July, the global average temperature was 0.95°C warmer than the 20th century average, which means it was the second-warmest first half of a year on record (this is equal to 2017, while 2016 holds the record for the warmest first six months of the year).

This period was the hottest on record for parts of Australia, New Zealand, North and South America, Asia and Africa, as well as areas of the Atlantic, western Pacific, and western Indian Oceans.

These temperature readings are confirmed in reports from other institutions, including the United Nations, NASA, the World Meteorological Organization and the Intergovernmental Panel on Climate Change.

Information. For the full report go to NOAA's website <https://www.ncdc.noaa.gov/sotc/global/201907>.

BOM PREDICTS DRY TO CONTINUE

At the end of August, the Australian Bureau of Meteorology issued its climate prediction for the rest of 2019. The forecast is for the dry to continue.

- A drier than average end to the year is likely for much of Australia, although the outlook for western Tasmania and southwest WA indicates a wetter than average September.
- Spring days are likely to be warmer than average for mainland Australia, but cooler for western Tasmania.
- Warmer than average nights are likely in the north and west during spring. With below average rainfall forecast and therefore clearer skies, nights are likely to be cooler than average in parts of the south at times, with increased risk of frost in susceptible areas.
- Cooler than average nights are also expected in the tropics in the coming weeks.
- A positive Indian Ocean Dipole (IOD) remains the main driver of Australia's climate over the coming months. A positive IOD is typically associated with below average rainfall and warmer than average days for large parts of southern and central Australia.

Source: BoM Website www.bom.gov.au. Accessed 2 September 2019.

PUMP CALCULATIONS AT YOUR FINGERTIPS

Whatever the pump or the system, there are a number of online resources users can access, including those of pump manufacturers. Another is the Pump Calc website, which was developed in the US to provide information to professionals involved in pumping. Website www.pumpcalc.com.

PUMP CALCS
Simplified Pump Calculations for Sophisticated Results

HAVE QUESTIONS? ASK EXPERTS IN THE EMPOWERING PUMPS INDUSTRY FORUM.

Calculators

- Basic**
 - Centrifugal Pumps: Single Impeller, Double Impeller, Pump Efficiency, Specific Speed, Motor Selection
 - Electrical Motors & Systems: HP - AC Single Phase, HP - AC Three Phase, Motor Selection, Motor Efficiency, Motor Selection
 - Mechanical Seals and Checkvalves: Motor Sealing, Motor Sealing
- Advanced**
 - Vertical Turbine Pumps: Power, Head, and Flow, Operating Pressure, Motor Selection, Motor Selection
 - PS Pumps: Power, Head, and Flow, Operating Pressure, Motor Selection, Motor Selection
 - Pump Design: Pump Design, Motor Selection, Motor Selection
 - Vertical: Motor Selection, Motor Selection, Motor Selection
- Expert**
 - Centrifugal Pumps: Motor Selection, Motor Selection
 - Vertical Turbine Pumps: Motor Selection, Motor Selection

WESTERN MURRAY IRRIGATION UPGRADES WATER METER FLEET

In May this year, Western Murray Irrigation (WMI) selected Siemens to help upgrade its water supply to farmers across an area of 5,000 ha in one of Australia's most important horticultural regions in south-west New South Wales.

In a \$2 million deal, Siemens will supply 365 irrigation flow meters and telemetry systems, which will allow WMI to provide real-time monitoring and control of their entire irrigation system.

According to WMI CEO Judith Damiani, it is an investment in the future for the Sunraysia region.

"Our priority is to sustain the horticultural producers who provide food, employment, economic and export benefits to our local region, state and Australia as a whole. This new digital water infrastructure is critical to their ongoing success because it is accurate, efficient and will provide real-time data to help them make informed decisions," she said.

The new Siemens Mag8000 flow meters replace an aging fleet of mechanical flow. The new meters and associated technology will help optimise water supply and consumption. It will provide for best practice leakage detection and accurate billing.

The new water meters have intelligent features built in. There is advanced display of information, on-site data collection and remote monitoring via communication networks. This solution provides an open communication platform to make network integration easy.

It can be integrated into current farm irrigation systems. And it is open for upgrading to communication network platforms of the future, eliminating the need to re-invest in new water meters, or making a step wise investment.

Siemens in partnership with WMI is managing the project with installation commencing in winter 2019.



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NEW PRODUCTS

FRANKLIN ELECTRIC

TOP THREE BENEFITS OF VFDS FOR IRRIGATION PUMPING

Variable frequency drives (VFDs) are now widely used for irrigation pumping applications due to the many cost-saving opportunities they provide. Here, we look at the top three benefits irrigators can take advantage of by installing VFDs on irrigation pumps.

Energy savings through system flexibility

One of the major benefits of VFDs is that they can be programmed to run the pump at a certain speed and flow rate. This is beneficial for agricultural irrigation systems that are zoned by field type, crop type, crop maturity and elevation, and can require different flow rates.

VFDs allow irrigators to customise the way the system runs so that pump speed will slow down, and flow and pressure reduced to operate a smaller zone at BEP, resulting in less system maintenance, longer equipment lifecycle and reduced energy costs.

Reduced water loss

By ensuring pumps operate at the optimum pressure for the irrigation application, VFDs have cost and environmental saving benefits for water. If an irrigation system is operated with more pressure than required, sprinklers will mist which creates smaller water droplets through the nozzle that are more easily moved by the wind and evaporated into the atmosphere. This results in a loss of water as it is less likely to reach the crop.

Maintenance savings

VFDs are soft-start devices so problems associated with waterhammer and excess power draw during start-up are eliminated, and flow or pressure surges are reduced. This decreases wear, particularly on bearings and seals.

The Franklin Electric advantage

Franklin Electric's line of VFDs - Drive-Tech - was designed and developed to optimise, control and protect pumping systems and is compatible with different types of pumps. They can be used for water supply and irrigation applications and are suitable to operate most new or existing systems up to 1.5kW.

For more information visit www.franklin-electric.com.



← page 9

Modernisation scheme receives international recognition (cont.)

drying and wetting cycle of the summer-dominant pumping regime meant the clay kept migrating downstream away from the leaks. The selection of the rubber membrane channel liner was a major leap of faith as the product had never been used before on such a large scale in irrigation channels worldwide, but the advice, backup and warranty from Firestone gave the Board the confidence to proceed.

Including the automated Rubicon Total Channel Control system has substantially increased the level of service of water delivery to the members, allowing on time and accurate on-farm water supply and measurement. As a result of lining the channels and installing channel control, conveyance losses have been reduced from a historical average of 25 per cent to 7 per cent. Substantial volumes of rainfall are captured and held in the lined channel sections most winters, often providing the initial pool fills before pumping season commencing. This has all lead to the farming members now having more water available to them at the farm gate now than pre-project.

- The stock and domestic pipeline system has exceeded all expectations, with over 90 per cent water savings achieved and clean, pressurised river water available to all our members every day of the year. Previously, this water was only when irrigation water was being supplied through the channels.
- The on-farm infrastructure upgrades on the remaining member farms have led to both water savings and yield increases on both summer and winter crops grown. Most of these projects were based around replacing traditional furrow surface irrigation with centre pivot and linear move irrigators. Water use on cotton crops grown under these machines has reduced by around 1 ML per ha while crop yields have risen by 1- to 2 bales/ha, leading to WUE increases of about 30 per cent. WUE of rotational winter crops has also improved.

Expectations exceeded

According to TNCL chairman Jim Winter, this project exceeded everyone's expectations.

"It has not only reduced channel conveyance losses substantially, but also has a much higher level of service delivery of irrigation water and increased crop water use efficiency across our members' farms," he said.

As well, clean, fresh, pressurised stock and domestic water is available every day of the year.

"Our members are happy and secure in the knowledge there is another 50 years of productive irrigated agriculture ahead of them and their families," he added.

Congratulations to the board and members of the TNCL for well-deserved recognition of this innovative project by the WatSave awards.

Check out Irrigation Australia's website, facebook page and twitter feed.



Web: www.irrigationaustralia.com.au

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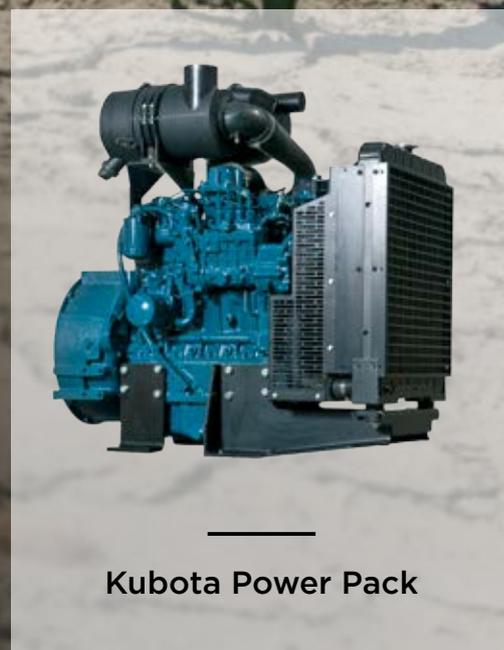
Serious power and reliability

Kubota's Power Packs are pre-assembled industrial engines and make choosing the right engine for your equipment easy. Simply hook it up to your pump and it's good to go when you are.

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