



FEATURES

Good design and installation
Training and professional development

NEW COURSE

Irrigation systems auditor

RURAL

Real-time data
improves water
management

THE BIG ISSUE

Converting open
channels to pipeline

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IRRIGATION AUSTRALIA CONFERENCE UPDATE
IRRIGATION DESIGN FOR AGRICULTURE
SUBMERSIBLE VS TURBINE PUMPS
NEW IRRIGATION TOOL FOR APPLE GROWERS

ISSN 0818-9447

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ON THE FRONT COVER:
Scott Howard, Darcy Leatham and Daniel Larcome from Murray Irrigation completed the Meter Installation and Validation course in 2021.

WELCOME



CHAIR'S MESSAGE

As I write this Chair's message it seems the world around us is in an unprecedented state of flux. Governments at all levels are making, and then rapidly changing, decisions on how to best manage the impact of a world pandemic on the Australian population. We have local weather changing from drought to floods to storms to bushfires almost overnight. Abroad, various nations are in diplomatic situations that suggest long-term planning could at best be fraught with challenges, and at worst a waste of time.

Amid all this, our irrigation industry – our livelihood – must continually adjust to meet the needs of irrigators. Whether for food production, pasture, amenity landscape or other purposes, efficient irrigation helps the end-user to address the challenges presented by the world, and in doing so, sustain and enhance their livelihood and the economy of our nation.

Irrigation Australia works in various ways to support its members through

these challenging times – providing a robust and reliable source of industry training; advocacy on behalf of our industry; communications about matters that affect our industry; and in fact, a focal point for discussion of any matter our members raise with us. The small but dedicated team in our Brisbane and Perth offices have been pushing all boundaries to continue remote service delivery during the pandemic. The response from members has been fantastic, and your support for Irrigation Australia is greatly appreciated.

After such a long period of having to engage remotely with our industry partners, we are eagerly looking forward to the Irrigation Australia Conference and Exhibition to be held in Adelaide in October. Finally, our industry will again be able to meet face to face, to rekindle business relationships that may have faltered over the past three years, and to establish new

relationships with our industry peers. Your Irrigation Australia team is working hard to ensure that those attending this event have the best possible experience – more on this elsewhere in the journal.

In another coming change, after six years of service with Irrigation Australia, our Chief Executive Officer Bryan Ward has advised the Board of his intention to retire after the Irrigation Australia conference later this year. The Board have engaged the Lucas Group to commence a recruitment process and we plan to have our new CEO designate available at the conference to meet with members and our industry partners. We are anticipating strong interest in this role and we look forward to the appointment of a candidate who will capably lead the organisation in the next stage of our journey.

Andrew Ogden
Chair



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WELCOME



FROM THE CEO

Welcome to the first *Irrigation Journal* for 2022.

I thought I would start this year with some positive news from your irrigation association – in particular, I'd like to highlight three initiatives:

New industrial relations and human resources service

Irrigation Australia is pleased to announce a new partnership with the Master Plumbers' Association of Queensland (MPAQ) where MPAQ will provide human resources and industrial relations (HR/IR) services for Irrigation Australia members applicable to their state. The agreement includes the provision of free award summaries, wages, allowances and fact sheets for five key industry awards. You can download these documents from the [Irrigation Australia website](#): just select the Member Centre, which will be visible once you have logged in.

Additionally, if you need help with any award, enterprise bargaining agreement or industrial matter, we now offer a personalised HR/IR service on a fee-for-service basis. The service will be provided by MPAQ, and members will be invoiced by Irrigation Australia once the service is complete. Further information can be found in the Member Centre.

It is likely that in the coming year, Fair Work Australia and industry unions will be focusing on business compliance with Australian workplace laws around payment of appropriate wages and superannuation, and that many more employers and industries will be targeted. Accordingly, we recommend that members audit payments to staff to ensure that your employees are all paid and classified appropriately. If you need assistance with or advice about this, the experienced team at MPAQ can help at a competitive price.

New customer relationship management system and website

We are in the middle of a transition to a new customer relationship management (CRM) system. This new system will deliver many benefits to our members and solve several frustrating issues – for example, members will soon be able to register a separate accounts payable email address to receive membership invoices. With this new CRM system comes a brand-new website with a fresh look and increased functionality. We hope to have the new system go live in May 2022, and before this occurs, we will provide all members with information on using and logging into the new CRM. We will be asking

members to review and update their membership details including maintenance of their linked employees.

Conference and exhibition

The Irrigation Australia Conference and Exhibition combined with the ICID 24th International Congress and Executive Council Meeting in Adelaide is now only eight months away. This is an exciting time for the irrigation sector, as the last significant event was in 2018 and much has happened since then. Many papers by international and Australian authors have been submitted for consideration, and this is sure to result in a high-quality program.

Manufacturers and suppliers have expressed significant interest in the large exhibition, recognising the opportunity to meet and showcase their products to a large percentage of the irrigation industry over three days.

A number of side events and workshops coincide with this event, including a one-day geosynthetics workshop.

Early-bird registrations are now open and further information on this event can be found at the [event website](#).

We look forward to seeing you there.

Bryan Ward
CEO

Check out Irrigation Australia's social media feeds.



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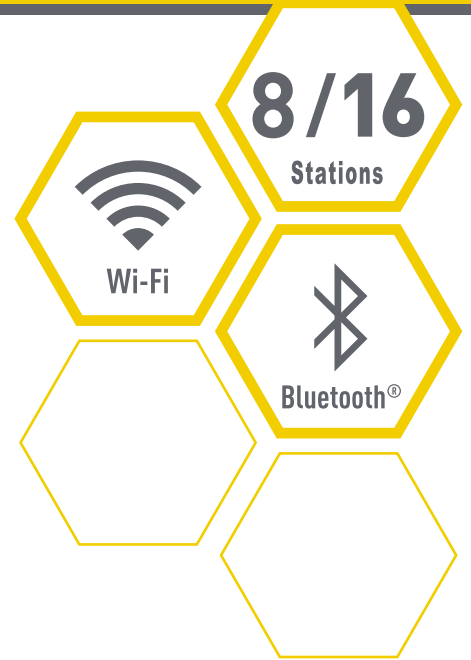
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PRO SMART CONTROLLER

The Pro Smart Controller is so easy to program and simple to use including an oversized LCD display and weatherproof case. The mobile app allows users to control watering from anywhere. Available in 8 or 16 stations, the controller will adjust watering based on local weather and site conditions to reduce water waste.



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REAL-TIME DATA IMPROVES WATER MANAGEMENT

SNAPSHOT

- Innovative technologies that produce data are seen as an effective way for farmers to grow horticultural produce efficiently and in an environmentally sustainable way.
- The Smart Farms Project, which is a six-year project funded until 2023 by the Australian Government and a range of stakeholders and industry partners, is trialling digital remote monitoring equipment as a way of improving the environmental performance of agriculture and horticulture.
- Bundaberg chilli producers, AustChilli, have established a pilot farm as part of the project to develop new technologies and tools to help horticultural businesses improve nutrient, water and labour use efficiencies.
- Technologies they are trialling include Full Stop wetting front detectors, soil moisture sensors, dendrometers and rated flumes.

There is a growing desire from farmers and consumers for produce to be grown using more efficient and environmentally friendly on-farm practices. A key step in achieving this goal is to find new and innovative ways to deliver real-time field data into the hands of farmers, allowing them to make best decisions for their crop.

Bundaberg growers AustChilli have established a pilot smart farm to develop new technologies and tools that will help Australian horticultural businesses improve nutrient, water and labour use efficiencies. AustChilli is the largest chilli grower in Australia. The 160 ha operation is family owned and operated and has vertically integrated on-site production, processing and packing facilities.

The new systems, developed by project partners Applied Horticultural Research and Hitachi Vantara, focus on real-time monitoring and data collection combined with a user-friendly interface. This combination can help farmers maximise nutrient and water use efficiency and minimise inputs of inorganic nitrogen and phosphorus, reducing potential run-off.



Measurements from soil moisture sensors are used to minimise overwatering and detect leaching events.



Run-off flumes have been installed to monitor flow rates and minimise nutrient loss to the environment.



Full Stop wetting front detectors are used to monitor nitrate runoff.

The establishment of the AustChilli pilot smart farm allows these technologies to be tested in a working farm environment.

Technology

A range of technology has been installed on the pilot smart farm, most of them supporting improved irrigation management. The different technologies and their functions are shown in the table (next page).



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TECHNOLOGY: RURAL

TABLE. TECHNOLOGY INSTALLED ON THE PILOT SMART FARM.

Technology	Productivity	Environmental	BMP
Weather station	On-site real time weather information, such as wind and rain	Overwatering can be minimised	Spray records are automatically populated
Smartphone and tablet	Reduced time required for audit forms	Improved accuracy of audit forms	Freshcare environmental records are automated
Full Stop wetting front detectors	Improved nitrogen management	Nitrate loss to environment can be minimised	Nitrate runoff and leaching load manually monitored
Soil moisture to 80 cm	Improved irrigation management	Overwatering can be minimised	Leaching events are detected
Rated flumes	Improved irrigation and nitrogen management	Nutrient loss to environment can be minimised	Runoff loads can be calculated
Stem dendrometer	Improved irrigation and tree stress management	Overwatering can be minimised	

Decision support tools

Farm staff have access to a range of decision support tools to help interpret information from the technology that has been installed.

These include the following:

- simple displays of soil moisture, evapotranspiration and plant stress data show if irrigation matches plant water use
- seven-day forecasts of nutrient runoff and leaching for better managing irrigation and fertiliser timing
- growing degree day forecasts, to predict a fruit maturity date using short-term and seasonal forecasts
- simple displays of current and predicted spray conditions with guidelines on when to avoid spraying
- interactive farm overlay of field conditions, plant health, sensors, assets, and plant health.

Crop X soil moisture probes

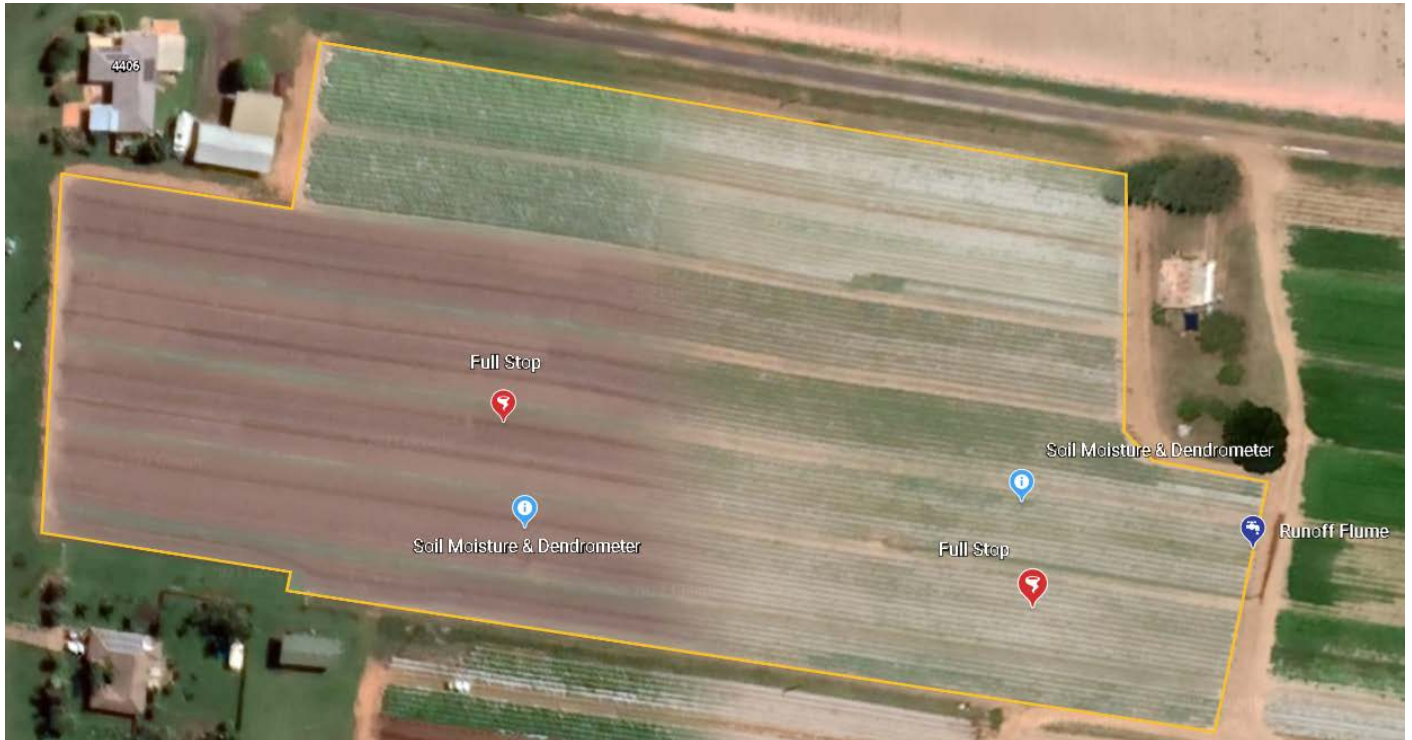
Crop X soil moisture probes are being trialled at AustChilli. These sensors, which are preferred to regular soil moisture sensors in short-term crops such as chillies, are easily installed and removed, with minimal soil disturbance. The probe is shaped to behave like a screw, an advantage compared to the cables of conventional sensors. This is especially important when monitoring chillies, because of the regular cultivation and rotation involved with growing them. The Crop X soil moisture probes will be compared to TDT sensors in this trial.

Future activities

With the equipment installed and data being collected, the project partners and AustChilli are now installing more sensors. The next step will be using the information they are collecting to develop nutrient and growth models with the aim of improving water using efficiency and nutrient management.



Crop X soil moisture probes, which can be easily installed and removed, are trialled on the farm.



Top: An aerial view of the farm showing the location of soil moisture sensors and the weather station **Above:** The environmental block with locations of monitoring equipment.

Acknowledgment. Thanks to AHR for permission to reproduce this information. You can download factsheets on four pilot smart farms in Great Barrier Reef catchments from their [website](#).

SMART FARM PROJECT

The Smart Farm Project, funded by the Australian Government, is trialling digital remote monitoring equipment as a way of improving the environmental performance of agriculture and horticulture. A range of stakeholders and horticultural industries are collaborating in the project to build innovative digital smart farms to drive improvements in soil and water resource management in sensitive catchments across the Great Barrier Reef in Queensland.

The AustChilli smart farm is a part of the *Digital remote monitoring to improve horticulture's environmental performance project* funded by the National Landcare Program and Hort Innovation, which is part of the Smart Farm project.

As part of the project, Applied Horticultural Research is developing water balance, nutrient load and growth models that will be updated by soil, plant, and weather sensors. Hitachi Vantara is developing the control tower to holistically measure farm productivity and environmental stewardship by integrating sensor data, weather forecasts and biophysical models.

AUSVEG and Freshcare are also supporting the project by exploring how these new technologies can be used to automatically collect and provide evidence for certification audits and BMP systems, including EnviroVeg and Freshcare ENV. This will significantly reduce barriers to Best Management Practice adoption for Australian farmers.

The project will automate much of the Freshcare Environmental audit reports and provide decision support tools for managing nutrient runoff and leaching.



IRRIGATION DESIGN AND INSTALLATION – BALDIVIS DISTRICT SPORTING COMPLEX

SNAPSHOT

- The City of Rockingham is constructing Baldavis District Sporting Complex on a 20 ha site south of Perth
- Irrigation of the outdoor areas relies on groundwater from two bores
- This article, provided by the City of Rockingham, describes the design and installation of the irrigation system for this site.

The City of Rockingham is constructing the Baldavis District Sporting Complex (BDSC) on a 20 ha site in the rapidly growing suburb of Baldavis, south of Perth.

After extensive consultation with the community, sporting groups and government departments, civil engineering works commenced in March 2020, and Stage One has a projected completion date of mid-2022. The first stage will deliver a district-level pavilion and multiple playing ovals. Once all stages are complete, the BDSC will provide about 8 ha of open space, two pavilions, a nature playground, youth space and an indoor recreation centre. The outdoors areas will be irrigated with groundwater.

Groundwater analysis

As part of the due diligence and early planning process, a hydrogeological assessment was undertaken to determine potential groundwater availability, access and extraction.

Tests conducted at five test bores showed that adequate water was available to irrigate the future site and reconfirmed the methodology of constructing two production bores to distribute water across the area.

An existing groundwater licence was in place on one of the lots; however, the allocation was not adequate to service the complex. The City applied to Department of Water and Environmental Regulation (DWER) for an amendment to the licence to include the remaining three lots that form the site, increase the allocation, and applied for a construction watering licence.

The groundwater aquifer within the Baldavis area generally contains a high iron content; however, in this case the static water level was approximately 4 m, which was unique in depth and provided an iron content of > 0.01 ppm in that specific corridor of groundwater.



Hunter i40 sprinklers with opposing nozzles were used.



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Sprinklers were tested to check application rates and uniformity.



Bore construction

Two production bore locations were nominated from among the test holes. They were chosen because they were outside the 500 m conservation and wetland parameters set by DWER as part of the City's groundwater licence.

The two bores were constructed using 200 mm PVC casing with a 9 m stainless-steel screen to a depth of 18 m.

The test pumping results indicated that a delivery of 20 L/PS out of each bore could be achieved with limited drawdown, which did not hinder abstraction from the bores with a near-instantaneous recovery time over an 8-hour step-and-pumping test period.

Two SP 77 -8b 26 KW pumps were constructed with an operating pressure of 770 kPa at the bore head and a DWER approved headwork's with a MAGS1 digital water metre and flushing head.

Design methodology

The irrigation design parameters were determined by Brendan Evans, Irrigation Supervisor, to consist of the following:

- Achieve a CU/DU across the active sporting playing area of above 90 percent in testing environment.
- Focus on the delivery of water to the active areas only – incorporating hydrozoning and ecozoning. This included individual stations for particular parts of the field such as: wing areas, interchange bench areas, inside 50 m area, and additional focus on high-wear zones such as the goal square and centre bounce areas.
- Providing individual valves within these key-use areas to enable effective and efficient watering of future areas subject to being re-turfed each season.
- Hunter i40 sprinklers with opposing nozzles were the preferred sprinkler, due to the delivery performances, as noted in the Hunter product manual. The expected higher pressure chosen for the pump would enable the higher

sprinkler optimal pressure < 550 kPa at the head to be achieved and to potentially deliver the greatest level of precipitation and water application efficiency.

- Sprinkler spacings were nominated at 16 x 16 m or as near as possible based on the CU/DU achieved, and to fit inside the oval parameters.
- Six-inch gear drives were requested for the design instead of the normal 4-inch.
- Poly pipe was the chosen pipe work across the entire oval, lateral and mainline over the standard PVC pipework, which has been typically used in the past.
- Rainman MPG TWIN board controllers were to be designed: two controllers, one at each cubicle, running two VFD drives next to each bore headworks with TWIN Rainman decoders. This was selected to provide flexibility to run one pump and up to four stations or two pumps and up to eight stations. However, only one operating controller was installed, with the secondary controller being predominantly pump-start and communications.
- Two 4G modems were installed with SIM cards that enable the controllers to run through the City's central control system inside the virtual City server and mobile phone applications. The central server provides trends of milliamps, flow and pressure, station data, systems alarms, configuration set points and many more useful functions. A direct pump start cable has been run to link the two pumps together back at the main operating controller.
- Isolators have been installed to isolate the main oval from the secondary fields to enable the two pumps and fields to operate through separate pumps and programs.
- Bermad 100 series 6 bolts were selected to operate a higher flow rate per valve to distribute the water. This enabled us to minimise infrastructure onsite by running maximum lines where practicable while still fitting inside the hydrozoning and ecozoning parameters of the irrigation system.

- The design was also to accommodate operation from only one bore source to irrigate the entire complex; therefore, if there was an issue over holidays or weekends, the system could still operate from one bore/pump system. The end design enables one pump to operate the main oval in approximately three hours, one pump to operate the secondary oval in approximately seven hours. The entire complex could be operated by two pumps in approximately five hours or one in approximately 11 hours.

The design phase was awarded to Total Eden through quotation process that follows the City's procurement process. The design process involved extensive consultation, and took five revisions to meet the complex design parameters.

Construction

The irrigation installation component of the project was put out for tender in 2020, and Newground Water Services was the successful tenderer to install the infield irrigation, using the Total Eden irrigation design.

Only one bore was equipped and energised during the irrigation installation. This was run through an onsite

generator for the entire construction period as the site did not have mains power at this time. This enabled the contractors to flush, test and operate the system.

The 160 mm poly ring main was installed first with flushing and tests undertaken. Valves were installed with wiring connected before the lateral poly pipe and sprinklers were installed.

Installation was completed within the planned construction period of six weeks. Some minor redesign was required due to modification to the upper oval playing surface sizing.

System delivery and parameters

Catch can tests were placed on the site once the irrigation system was established. Thirty-six cups were placed across an area on the playing oval. The average total of water was 4.63 mm and the lowest quarter was 4.16 mm, giving a DU rate of 90 percent and CU of 94 percent, with an average precipitation rate of 18.1 mm/hour.

Acknowledgment. This article, provided by the City of Rockingham, was originally published in *The Overflow*.

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IRRIGATION AND NITROGEN DECISION TOOL FOR APPLE GROWERS

SNAPSHOT

- Researchers at the Tasmanian Institute of Agriculture (TIA) have developed SINATA (the Strategic Irrigation and Nitrogen Assessment Tool), a simple decision-support tool to help apple growers manage their orchard's water and nitrogen (N) inputs while maximising fruit quality
- The model is based on eight years of field trials investigating the effect of N and water application on fruit quantity and quality in different varieties of apple in areas with varying climatic and soil properties
- Growers can enter their soil type, local climate and tree information in an Excel workbook to determine average irrigation and N requirements, assess the efficiency of their current practices and explore potential savings associated with changes in irrigation and nitrogen application

Researchers at the Tasmanian Institute of Agriculture (TIA) have developed SINATA (the Strategic Irrigation and Nitrogen Assessment Tool for Apples), a simple decision-support tool to help apple growers manage their orchard's water and nitrogen (N) inputs, boosting productivity and maximising fruit quality. Irrigation and nitrogen are often studied independently, but in SINATA they are integrated to give a better reflection of what is happening in the system as a whole.

The tool is based on data from eight years of field trial research in Tasmania and Victoria investigating tree water use and N content of the leaves and fruit. The model incorporates data about hydraulic and physiochemical soil properties for five key apple growing regions in the country, so it can be used by growers in different areas.



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3. Irrigation

The purpose of this worksheet is to define some details about the irrigation system
 Values in the green boxes are changed by either entering a value in the box or selecting a value from a pull-down list
 The worksheet has blue boxes that display typical maximum flow rates for each emitter type
 Note: the apple variety is shown in a white box and it has already been set on worksheet No. 1.

Select the emitter type (click on the green box) from the pull-down menu

- there are 3 types of emitters (dripper, micro- and min-sprinkler)
- set the rated emitter output (L/hr).
- The size of the wetted area is calculated using flow characteristics related to the output rate (L/hr) and the type of emitter
- the 'wetted area' is used in the water balance calculations to determine how much water is evaporated from the soil surface

Set the emitter spacing and the distance between the irrigation lines

- typically there would be one irrigation line in each row of trees
- these two factors determine water volumes applied per hectare
- In this example, there are 1250 emitters per hectare.

Each emitter outputs 50 L/hr = 62500 liters per hour for each hectare = 0.0625 ML/hr/ha
 For the 10 yr old trees at Grove (as shown above), 45 minutes of irrigation will replace daily tree water use during mid-summer

Select the irrigation strategy (click on the green box) from the pull-down menu

- SINATA provides for a choice of 5 irrigation strategies
- each strategy is defined by a set point that changes during the season
- the set point is defined as a fraction of plant available water (PAWC)
- this is the amount of water held in the root-zone soil between field capacity (FC) and wilting point (WP)
- for more details information on the soil's hydraulic properties (FC and WP) go to the AppleSoils website
www.applesoils.com
- Scientific literature shows apple trees begin to exhibit symptoms of water stress once the root-zone water deficit exceeds more than 50% of PAWC. Yields will be negatively impacted by mild water stresses.
- Irrigation strategies should aim to keep soil moisture above this 'stress point' during critical periods such as flowering and fruit set.
- SINATA can be used to investigate the potential impact of different irrigation strategies in terms of the total volumes of water uses and/or the yield outcomes resulting from mild water stresses

Variety	Gala	
Emitter type	micro-jet	wetted area (m ²)
Emitter output (L/hr)	50	5.6
Emitter spacing (m)	2	
Irrigation Line spacing (m)	4	
Irrigation strategy	Grower	
maximum rate (mm/wk)	0	

Irrigation strategy	Grower
maximum rate (mm/wk)	Conservative Early deficit Late deficit Replacement Grower

0. USER guideline 1. Location & Variety 2. Planting & Yield 3. Irrigation 4. Annual Water Balance 5. Weekly Water Balance 6. Annual Nitrogen

Figure 1. An excerpt from the irrigation section of the SINATA model's instruction sheet.

SINATA allows growers to look up their soil type, local climate and tree information to determine average irrigation and N requirements, assess the efficiency of their current management practices, and explore potential savings associated with changes in irrigation and nitrogen application (such as switching from calendar-based irrigation schedules to targeted schedules based on predicted soil moisture status).

Collecting baseline data

In an earlier project, PIPS1, the researchers spent several growing seasons running field trials in orchards in southern Tasmania and Victoria to get baseline data about water and N use by apple trees; how the timing and rate of these can be manipulated to produce high quality fruit; and the link between the percentage of N in fruit and the fruit's quality at harvest and after storage. The team used this data to develop a model, known as SPASMO (Soil Plant Atmosphere Model), originally developed by Plant and Food Research New Zealand, to accurately predict tree water use and nitrogen content in leaves and fruit of trees in Australian growing conditions.

But more data was needed to understand how rates and timings can be managed to satisfy the trees' nutrient requirements and to create a user-friendly tool for growers in different regions. In particular, the researchers needed to know the main sources of plant-available N within an orchard, when peak demand for N occurs, how much of this is provided by internal tree N, and how soil characteristics vary between key apple growing regions.

SINATA was developed

The recently completed four-year project, PIPS2, focussed on collecting this further information as well as extending their existing fertigation trials. The team used the SPASMO model, together with this additional data, to create SINATA.

To build on previous work and develop SINATA, the researchers:

- continued the fertigation trials started in earlier work, investigating the effect of rate and timing of N application under varying irrigation rates on 'Gala' fruit quality and productivity in an orchard in Tasmania.

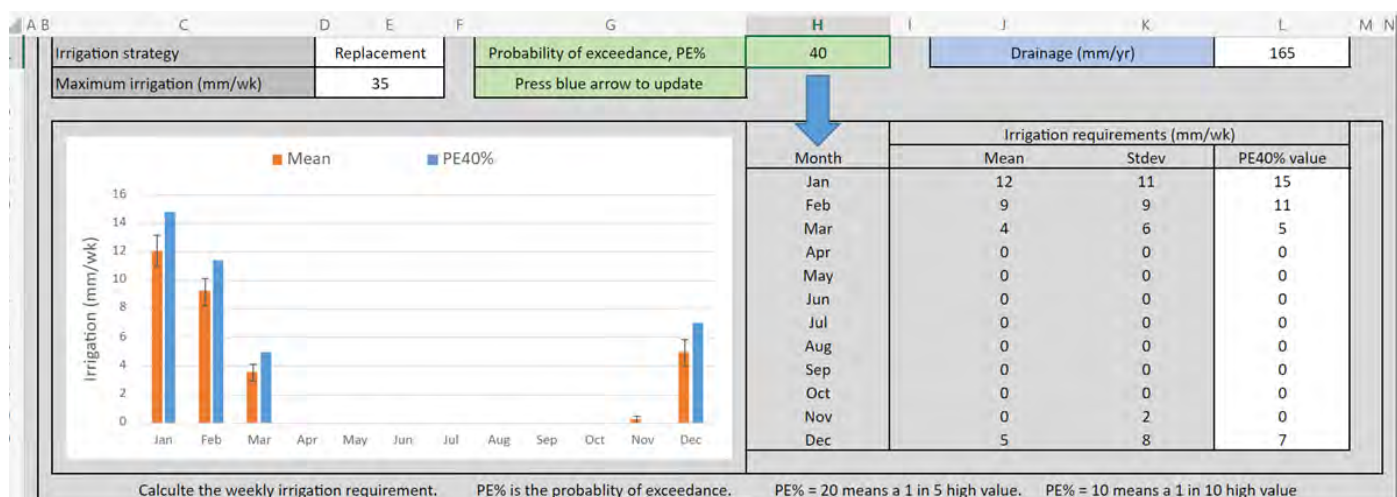


Figure 2. SINATA calculates a soil water balance to provide advice on crop water use and irrigation strategy.

- investigated 15N whole tree recovery to determine how much fertiliser nitrogen is taken up by the tree relative to soil nitrogen sources and the fate of this nitrogen in the tree. This research was to better understand N uptake efficiency in orchards, peak demand for N and internal N dynamics
- conducted a N, P and K fertigation trial to determine how the addition of N influences P and K uptake in trees
- analysed soil samples from orchards to determine the ability of the soil to supply N to trees
- characterised soils from 40 different orchards from five apple growing regions, looking at the following soil properties for each soil layer: saturation, plant available water content, permanent wilting point, hydraulic conductivity, soil carbon and nitrogen distribution with depth including each of the soil carbon pools, as well as observation of root distribution.

How SINATA can help growers

The main goal of SINATA is to understand how water and fertiliser application (rates, timings) can be managed to satisfy the tree's requirements, mitigating leaching and optimising productivity without cost to fruit quality.

SINATA, formulated in Excel, works at the block scale to determine water and N needs based on local soil and climate conditions, tree age and anticipated crop yields.

The model comprises worksheets that enable the user to set inputs, e.g., to describe the soil and climate and irrigation within the orchard block (Figure 1), and to view outputs and outcomes of management decisions – e.g., annual and monthly water and nutrient balances in response to irrigation and N-fertiliser use.

The model provides advice about irrigation and N needs in a particular orchard by using local climate and soil data as well as phenology and yield for different apple varieties. The following list outlines the key elements of the model:

- inputs – soil (hydraulic and physio-chemical properties), plant (crop factors and productivity), atmosphere (long term climate including evapotranspiration and rainfall) data

- processes – water (uptake, runoff, drainage, storage) and nitrogen (uptake, soil transformation, leaching, runoff) balances
- functional descriptions of tree productivity (variety and age relationships including phenology and yield)
- outputs –monthly and annual water and nitrogen balances
The user can choose from various options on a pull-down menu to describe location, variety, irrigation and fertigation on the tool's 'Input page' worksheet. The remaining factors are set internally, by default, and are from within a set of linked worksheets ('parameters', 'soil', 'crop' and 'climate' data) that are normally hidden from the user's view.

SINATA can help growers by:

- calculating a soil water balance – to provide advice on crop water use and irrigation strategy (see Figure 2)
- simulating crop growth, dry matter allocation, N distribution – to advise on tree N demands and returns of N from organic matter (leaves and prunings)
- simulating N turnover in the soil – to advise how much N is mineralised from soil organic matter, tied up through denitrification or lost to leaching
- calculating a soil N balance from grower inputs – to provide advice on the fate of surface applied fertiliser
- estimating the environmental impact in terms of N losses

SINATA will continue to be fine-tuned and improved with inputs of both new research data and feedback from grower workshops during 2022.

Information. You can access SINATA [here](#)

Source. You can read the full report on the Hort Innovation [website](#). This project was funded by Hort Innovation, using the Apple and Pear research and development levy and contributions from the Australian Government and the University of Tasmania. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.



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Your options for certification and training

Certification is a national program of industry recognition. Being certified means that an individual is licensed by an industry body to perform a job. It shows that the person has a minimum set of knowledge, skills or abilities to perform their job to the satisfaction of water managers and customers.

Certification grants you a point of difference in the marketplace. The Irrigation Australia certification program is highly regarded by customers, who consider it a mark of quality assurance – it gives them confidence that the service provider will meet or exceed the average industry standards.

THE GROWTH OF CERTIFICATION

Geoff Harvey, Irrigation Australia's national training, certification and marketing manager, explains that Irrigation Australia's certification program has been around since 1982 and has grown over time.

"We run the Certified Irrigation Designer (CID) program under licence from the Irrigation Association (IA) in US. The other ten programs [see pages 19 and 20 for more information] have been developed by us in Australia, and the IA is interested in duplicating some of them in the US."

Geoff has noticed that over the years, more local governments, organisations and businesses have been asking for certified irrigation professionals, "We're seeing that organisations, especially governments, are looking for certified professionals. It's now legislated in some states that meter installers/validators must be certified in order to do this work.

"We're seeing a similar trend with irrigation design as well – councils are starting to require their irrigation systems be designed by CIDs. For large irrigation projects, too, the federal government has said they'd like to have them approved by CIDs."

Owing to the increasing demand for certified professionals, more people in the industry are choosing to go through the certification process. "It's definitely growing," Geoff says, "There are more than 800 certified professionals in Australia across all disciplines. Many of these are certified meter installers and validators. The CID program is taking off too, with about 30 people going through the program at any one time."

HOW DO YOU GET CERTIFIED?

For all disciplines, you need a minimum level of industry experience to start with (usually three years). If you work in irrigation design and want to become a certified irrigation designer, you need to complete a series of exams. For the other disciplines, the process is different: instead of passing exams, you need to obtain competencies. This means you must be able to prove that you can competently perform certain essential tasks within your area of expertise.

Say, for example, you work in installation and want to become certified – you will need to tick off five of the following eight competencies (either one or two of these must be installation units):

- measure irrigation delivery system performance
- troubleshoot irrigation systems
- monitor soils under irrigation
- install irrigation pumps
- interpret irrigation plans and drawings
- install pressurised irrigation systems
- implement and monitor environmentally sustainable work practices
- install and terminate extra low voltage wiring system



OPMENT

You must get a Statement of Attainment for each of your nominated competencies from a relevant Registered Training Organisation (RTO) (to search for RTOs, visit the Department of Education, Skills and Employment [website](#)). Irrigation Australia operates its own RTO - Irrigation Training Australia.

To get each Statement of Attainment, you need to prove that you are competent in each area. There are two ways to do this:

- through recognised prior learning – this can include prior formal training, or skills you've learnt on the job. Evidence of this might include a reference or similar from your employer
- by course work – in a classroom or online. Irrigation Australia runs regular courses, which are listed [here](#).

You can find out about what competencies you need to meet for the different disciplines in [Irrigation Australia's Certification booklet](#).

According to Geoff, "People achieve certification through a blend of both recognised prior learning and course work – but we know there are actually a lot more people out there working in the industry who could achieve it through recognised prior learning alone.

"We can advise you on whether to use recognised prior learning, course work, or a mix of both. We try to make the process as easy as possible for people. Just contact us via the [IAL website](#) and we can work out what's best for you."

CERTIFICATIONS FOR DIFFERENT DISCIPLINES

There are currently 11 areas within the irrigation industry that you can obtain certification. These are:

Certified Irrigation Designer (CID).

Certified irrigation designers have the technical expertise and an up-to-date understanding of the latest water management practices to design, install, manage, and maintain a range of irrigation systems. This is an exam-based certification, and the process takes at least three years. The first step is to gain one year of field experience and then pass a prequalification exam.



Certified Irrigation Agronomist (CIAG).

If you're a practising agronomist with at least three years' experience and particular skills in irrigation then you may be eligible to become a certified irrigation agronomist. You'll most likely have a qualification in another discipline such as agriculture, horticulture or agronomy. You currently provide advice to end-users on system types, purchase and use, and you might troubleshoot, evaluate and audit irrigation systems.



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Certified Irrigation Contractor (CIC). If you're currently working as an irrigation contractor managing the installation process of irrigation systems, you may be eligible to become a certified irrigation contractor. You'll need to have at least three years' relevant experience that includes irrigation system installation and maintenance. You will use best practice in the installation and use of irrigation systems, and you'll understand the regulations relating to water access and use. You can recognise and minimise the environmental impacts of irrigation.



Certified Irrigation Installer (CII). If you're currently installing, troubleshooting, upgrading or repairing irrigation systems, and have three years' relevant experience, then you may be eligible to become a Certified Irrigation Installer. You will currently use best practice when installing a system, and can recognise and minimise the environmental impacts of irrigation.



Certified Irrigation Manager (CIM). If you are currently a farmer, farm manager, parks superintendent or turf manager responsible for applying water in irrigation systems you may be eligible to become a certified irrigation manager. You will have at least three years' relevant experience and currently be implementing best practice in irrigation and water use and can recognise and minimise the environmental impacts of irrigation.



Certified Irrigation Operator (CIO). If you're currently working on an irrigation system and you're responsible for the efficient and sustainable use of irrigation water, then you may be eligible to become a certified irrigation operator. To apply you'll need to be actively working in the irrigation industry, plus have three years relevant experience in assisting with the operation and maintenance of irrigation systems.



Certified Irrigation Retailer (CIR). To become a certified irrigation retailer you will be expected to be actively working in an irrigation retail business, using your substantial knowledge of irrigation hydraulics, pumps and components to understand and meet the needs of your customers. On application you will be working in the retail sector of the irrigation industry and have two years' relevant industry experience.



Certified Meter Installer and Validator (CMI) If you are currently installing and certifying irrigation water meters for agriculture or commercial fields you may be eligible to become a certified irrigation meter validator. To apply you'll need to be actively working in the irrigation industry, plus have three years relevant experience.



Certified Storage Water Meter Installer/Validator (CSV). In order to install and validate water storage meters, you must become qualified and certified as a Storage Meter Installer & Validator (CSV). The NSW Government requires that approved storage water meters be installed where a landowner holds a floodplain harvesting access license. This course covers how to select water storage meters, data loggers and telemetry systems and the installation, commissioning/maintenance and validation of water storage meters.



Certified Poly Welder – Electrofusion (CEW). This certification is achieved through coursework and practical exercises. It is designed for any worker who is required to use an electrofusion welder to form electrofusion welds on polyethylene pipes and fittings. Electrofusion is particularly suited to installations where access is difficult such as in trenches or around other pipes. Likewise, electrofusion is applicable to pipe sizes from 16 mm to 710 mm. It is appropriate for people involved in the installation and maintenance of pipelines transmitting gas and liquids as well as personnel working in the mining sector.

Certified Poly Welder – Butt Welding (CBW). This certification is achieved through coursework and practical exercises. It is designed for any worker who is required to use a butt welder to form butt welds on polyethylene pipes and fittings. Butt welding is applicable to pipe sizes from 50 mm to 2000 mm but wall thickness must be the same in the pieces to be joined. Also, butt welding removes the need for connection components while also allowing the pipe to bend without worrying about tension increase. It is appropriate for all people involved in the installation and maintenance of pipelines transmitting gas and liquids including those in the mining sector.

Irrigation Australia is also introducing a brand-new certification in 2022: Certified Irrigation Systems Auditor. You can find out more on page 22.

For more information on Irrigation Australia's certification programs, visit the [IAL website](#).

Certification – why it matters

While Irrigation Australia’s certification program is not new (it has been around for 40 years), the last five years or so have seen an increase in the number of irrigation professionals choosing to get certified, as well as more organisations requiring that their jobs be done by certified professionals.

With the growing value being placed on certification, there are clear advantages, from an employment and business perspective, to being certified. We got the lowdown from an irrigation designer and a local government staff member about why certification is worthwhile.

Perth-based irrigation designer, Troy Fiscus, Director of CadsultiDS, completed his CID in 2015. Troy says, “Achieving certification didn’t really change the way I worked as a designer, but it definitely helped to solidify the underlying knowledge – the theory of design.

“You need to have been in the industry for a while before you do the exam, but there are always some things that you don’t get exposed to in everyday design. So even an experienced designer can learn something in the process of studying.

“As well as this, being certified connects you a bit more to the industry. You get CPD points for activities like attending events. This encourages you to stay in touch with what’s going on and the latest technologies.”

Certification also gives irrigation professionals credibility, according to Troy, “Being able to say you’re a certified designer shows that you’ve been through the process; it shows that you’re legit”. It gives clients a sense of trust, knowing that they’re dealing with professionals.

“And for me, being certified gave me a bit more security. Some councils require it now, so it can open a few doors.”

DEMAND FROM CLIENTS GROWING

Josh Hill, Group Leader of Irrigation at Port Adelaide Enfield Council, shares this view: “Certification shows that the person has been taught the theory behind what they are doing, and we have greater confidence in their ability,” he says, “When we put out a tender, we engage a certified designer before going out to market for installation.

“At the moment, we don’t require certified installers, but this is going to change. There’s currently a shortage of certified installers, so we rely on people with a restricted plumber’s licence. We need more certified irrigation professionals.

“I’ve seen a huge change in the last four or five years in terms of demand for certified people,” Josh says, “This is being taken seriously by a lot of councils that I speak to.

“Plumbers are required to be licensed because they’re dealing with drinking water, so there are obvious safety issues. Irrigation is a different discipline, but decisions made by irrigation professionals are also important, particularly in terms of cost, efficiency, and environmental outcomes”.



Demand for training is growing from young professionals in the industry. Scott Howard, Darcy Leetham and Daniel Larcome completed the Meter Installation and Validation course in 2021.

The take-home message, according to Josh, is that open-space expenditure by councils is increasing and councils need to be confident that what they’re doing is efficient. But while Port Adelaide Enfield Council engages CIDs for their design work, there is a lack of certified installers.

“I’d like to see the public sector putting more people through training – for it to be subsidised. We’re seeing younger people coming through who say they didn’t have anyone to train them. The younger generation want training and councils want certified professionals.

“Certification matters for both environmental and economic reasons, and it’s going to be more important in the future, Josh says, “This is just going to pick up and keep running”.

Want to know more about certification?

Download the certification guide from the Irrigation Australia website.



New certification – Irrigation Systems Auditor



Irrigation Australia is introducing a new certification for 2022 – Certified Irrigation Systems Auditor.

This certification might be right for you if you are:

- a practising irrigation professional with a particular interest in auditing and exposure to irrigation system performance.
- currently providing advice, designing, or consulting to end-users on irrigation system types, purchasing, operation, troubleshooting or evaluating irrigation systems.

National Training, Certification and Marketing Manager Geoff Harvey says this certification was developed following member feedback, “We put out a survey and the number one thing that people were wanting was a certification in irrigation auditing. Our members want to be able to differentiate themselves – to have their skillset acknowledged.”

To be eligible, you must have at least three years relevant and documented experience as an irrigation designer, agronomist, advisor, consultant or manager. This certification can be achieved through a combination of on-the-job training, recognised prior learning and/or coursework.

To help people meet the required competencies, Irrigation Australia will be running a new course in irrigation systems auditing. The course includes Certificate IV and diploma-level subjects that cover the skills relating to all the competencies that are required to achieve certification in this discipline.

The first week-long course, in collaboration with the dairy industry, is planned for May and will be run in Brisbane.

SKILLS AND KNOWLEDGE

Irrigation Australia has aligned this new certification to the new nationally recognised (training.gov) Irrigation Systems Auditor skill set (AHCSS00099). To attain this skill set and become a Certified Irrigation Systems Auditor, the following seven competencies need to be completed:

1. AHCIRG435 Determine hydraulic parameters for an irrigation system
2. AHCIRG438 Select and manage pumping systems for irrigation
3. AHCIRG507 Audit irrigation systems
4. AHCWRK502 Collect and manage data health and safety processes
5. AHCWRK510 Audit site operations
6. AHCWRK513 Write and present reports
7. BSBINS401 Analyse and present research information

Other Statements of Attainment with similar skills and knowledge will be considered for credit towards these competencies.

Contact Irrigation Australia to find out more or to register your interest: training@irrigation.org.au.





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CHANGES IN THE PIPELINE

SNAPSHOT

- Up to 30 percent of water is lost from open irrigation channels through evaporation and seepage. Many ageing channel systems are being replaced with pipeline networks in Australia's main irrigation areas
- Pipelines result in significant water savings, are less labour-intensive, and require less maintenance than channels
- Pressurised pipeline systems allow greater areas of land to be irrigated and give farmers the option to use a range of irrigation techniques, such as centre pivot
- *Irrigation Australia* spoke to Mark Davies from Aquamonix, and Richard Yates and Stephen Cook from Harvey Water in Western Australia about their perspectives on the transition to pipeline systems.

In recent years there has been a move to replace ageing channel-based irrigation networks with pipeline systems, which offer many advantages, including reduced water loss due to evaporation and seepage.

The key drivers to move away from channels, according to Mark Davies, Business Manager of irrigation technology development company Aquamonix, are staffing issues, water losses and ageing infrastructure. In open channel systems, significant water loss occurs through evaporation and seepage. In addition, while some have been automated, reducing the amount of labour required, old channel systems typically require controllers to be available at every hour of the night to direct water through different channels, and not many people are willing to take this job on.

With ageing infrastructure and the availability of new automation technology, replacing channel networks with pipelines has many advantages, and over the last ten years, many kilometres of channels in Australia's major irrigation areas have been replaced.

Why pipelines?

Mark says that the advantages of pipeline over channel systems can be summed up as savings in water, time, and in many cases, energy.

In open channel systems, up to 30 percent of water is lost through evaporation and seepage; closed pipelines solve this problem.



In open channel systems, significant water loss occurs through evaporation and seepage.

But in addition, Mark says, pipeline systems can be more easily automated: "Supplying water just means opening a valve, and a flow meter measures how much water goes out. In the old days, water had to be ordered days in advance by irrigators and water had to travel from the dam through channels to the properties.

"A minimum volume had to be released every time, and this meant water was wasted. These systems had to manage water losses, and the controllers had to open and close multiple gates up and down the channels to direct water to the right places."

Pipeline systems, in contrast, are pressurised, with water always available in the pipes, enabling instantaneous delivery of water to the irrigator and an even take of water over a 24-hour period, which makes pressure management easier.

"The main consideration, when it comes to delivering water, is scheduling," Mark says. "Delivery of water to irrigators must be scheduled to ensure that the systems don't drain, which is a risk if too many people use water at once. From an irrigator's point of view, ordering water is a simple online process that no longer needs to be done days ahead."

Mark points out that there are less obvious side-benefits of converting to pipelines: it is easy to run these systems on solar power; opening and closing valves uses far less energy than the actuation control required to open and close gates.

In addition, pipeline systems don't present the risks to public safety and livestock that channels do. People in communities that have converted from channel to pipeline systems have also noticed that they have fewer mosquitoes.

Pipelines in Western Australia

Harvey Water, in south-west Western Australia, is a self-funded cooperative that delivers non-potable water to its 722 members and 285 non-member customers.

The main agricultural enterprises in this region are dairy, beef and horticulture. Traditionally, surface irrigation has been the main method used on the region's farms, with water delivered by channels, built in the 1950s, that are susceptible to leakage and evaporation. In the early 2000s, Harvey Water began to replace these with pipelines.

Stephen Cook, Operations Manager at Harvey Water, says, "We completed the Waroona pipe project, which was our test area, in 2003–2004, then the Harvey project from 2005 to 2009. Since then, we have continually expanded the area, replacing around 300 to 400 km of channel with high-density polyethylene pipe in the northern section.

"In total, we now have close to 600 km of pipeline in the ground, because where you've got the pipe you can extend the system and can take water to other areas that haven't had it in the past. The water is gravity-fed from dams in the hills."

New opportunities. Being able to extend the system introduces new opportunities: water can be delivered to areas that previously weren't irrigated, and the pressurised

system gives farmers the ability to use more efficient irrigation methods that result in on-farm water savings.

"With surface irrigation, farmers can typically irrigate one-third of the area of a farm", Stephen explains, "but with irrigation techniques that the pressurised pipelines enable, larger areas can be irrigated."

"If a farmer wants to change their irrigation methods, the pipeline gives them that opportunity. As a result, we're seeing more citrus and table grapes being produced here. Before, when we relied on channels, people could do small-scale horticulture with on-farm storage, but this wasn't common practice."

With the transition to pipeline, many farmers in the region have converted from surface to centre pivot irrigation in areas where it is feasible, and trials by Harvey Water have shown that this switch can significantly increase fodder production.

Although some farms are not well-suited to centre pivots, and are still using surface irrigation, they can still benefit from water-savings owing to the pressurised system.

"Many farmers have stayed with head ditches and are still using surface irrigation. But we are working on modernising surface irrigation by piping the head ditch systems and automating the irrigation bay delivery valves. As each bay is irrigated, the valve receives the signal to close down and the next one opens up; the farmer can plan and control irrigation from his computer or phone. Using piped head ditches instead of open-channel head ditches can result in 12 to 15 percent savings on-farm," Stephen explains.



Many farmers have stayed with head ditches and are still using surface irrigation but Harvey Water is working on ways to save water while using surface irrigation.

Longevity and maintenance. Although pipeline networks require a large initial outlay, they last longer and require far less maintenance than channels. "Pipeline lasts at least 100 years," Stephen says, "but actually, we expect it to last a lot longer than this."



“Also, in terms of maintenance, there’s no comparison: with a pipeline, everything is mapped out so we can locate pipes easily if necessary, to repair a leak or to add an extension. Old channels require regular concrete lining repairs, and major repairs in winter, when the weather makes it harder to get on with job. The concrete doesn’t last, and maintenance can be intensive.

“Some channels are hard to access on hilly terrain, and after storms, silt and debris need to be cleaned out. Over time, sediment builds up in channels, but with pipeline, we flush it out once a year, so we don’t have a problem with sediment.”

Planning for the future. Any large-scale changes to systems inevitably have flow-on effects. On the one hand, Richard Yates, Water Service Manager at Harvey Water, says, “You put the investment into the pipeline and the demand will follow, and we need to consider this in the design stage. The design of the pipe needs to be future-proofed – if you want to increase the flow once it’s in the ground, there is limited ability to do this, so it’s important to consider aspects like pipe size early in the process.”

On the other hand, while the pipeline will result in substantial water savings as well as increased demand and larger areas of irrigated land, the impacts of climate change will mean less water is available for irrigation.

These interacting factors contribute to the complexity of designing a large-scale irrigation network that will be viable in the long term. But one certainty is that pipeline can save us considerable amounts of water, which in a changing climate, is essential.

“Pipeline has reduced water losses by about 30 percent in this region”, Stephen says. “This is important because we have also seen rainfall diminish over 20 to 30 percent over 30 years here. Putting water in the pipe has breathed some life into the system and enabled us to manage water in a proactive way.”



Using piped head ditches instead of open-channel ditches can result in a 12 to 15 percent saving on-farm.

HISTORY OF IRRIGATION CHANNELS IN AUSTRALIA

Many of Australia’s irrigators have traditionally relied on extensive networks of channels to deliver water to their farms.

- Irrigation in the Murrumbidgee valley began in with the irrigation experiments of agricultural pioneer, Samuel McCaughey at North Yanco station in 1900. This private scheme involved the construction of around 320 kilometres of channels to irrigate about 162 square kilometres of land.
- McCaughey's success appeared to have encouraged the New South Wales government to commence large-scale irrigation. This process began in 1906 with the proclamation of the Barren Jack and Murrumbidgee Canals Construction Act 1906 (Cth). Burrinjuck Dam on the Murrumbidgee River near Tumut was commenced in 1907, work commenced on the channels and the first farms were established soon after.
- In Western Australia, the state's first controlled irrigation scheme, the Harvey Irrigation Scheme, was officially started in 1916. It was further developed during the latter part of the 1930s depression to take unemployed workers to dig and build the extensive irrigation channels in the district.
- From around 1910, Dethridge wheels were used to measure water flowing onto farms. The wheel was invented by John Dethridge, the commissioner of the Victorian State Rivers and Water Supply Commission. The revolving wheel measures the flow of water from the irrigation supply channels into the farm channels and provides the basis upon which irrigation farmers are charged for water. The measurements provided by this system were up to 18 percent inaccurate and the wheels are a WHS issue.
- Channel and gate systems were established in the 1970s. These were networks of concrete and unlined channels with weirs, and wheels or flow meters to measure how much water goes through. These channels allow large volumes of water to be distributed over extensive areas.
- The move to replace ageing channels with pipeline systems charged by pump stations began in around 2010, solving the problem of water loss through evaporation and seepage from open channel systems.

Sources. [The History of Irrigation - Irrigation Australia Limited](#) and ‘Modernisation of Irrigation Distribution Networks’ PowerPoint presentation by Aquamonix to Irrigation Australia Limited, 2018.



SURFACE IRRIGATION – FACTS VS FICTION

There is a perception held by some that surface irrigation is more inefficient and wasteful than other methods such as drip and centre pivot. The reality, however, is more nuanced. While the application technology is important, other factors such as design, maintenance and operator skills and knowledge are important in determining the efficiency of any irrigation system. Jim Purcell, long-time Irrigation Australia member and certified irrigation designer (surface), has a wealth of experience in designing surface systems around Australia. He recently put together a summary of the common misconceptions about surface irrigation, along with the facts.



Misconceptions	Facts								
Old, wasteful and inefficient	<ul style="list-style-type: none"> Precision surface irrigation can operate at >90% efficiency. As with any system, design, regular maintenance and management are important in determining efficiency. Surface irrigation is the cheapest system to build and the cheapest to operate, e.g. centre pivot and lateral move can cost \$25 to \$40/ML just to pressurise. 								
It doesn't really matter how long it takes to irrigate; the clay only takes so much water.	Duration of irrigation is a key variable in efficient surface irrigation. It is vital to understand the soil type. The rate of infiltration in a heavy clay, for example, slows dramatically but infiltration continues while the water is on the soil and if the irrigation continues for too long drainage below the root zone can occur.								
It is best to stop the siphons before the furrows run through because there is plenty of water still coming down.	Long runs and high flows rates need to run tailwater so siphons should not be stopped before the furrow run through.								
Siphon size doesn't make much difference	<p>Siphon size does have a significant impact on flow rate.</p> <p>The figures right illustrate how significant this can be using the example of 0.3 m head. Increasing the siphon size by from 50 mm to 75 mm more than doubles the flow rate. Irrigation time must be adjusted accordingly.</p> <table border="1" data-bbox="1086 1413 1465 1547"> <thead> <tr> <th>Siphon size (mm)</th> <th>Flow (L/sec)</th> </tr> </thead> <tbody> <tr> <td>50</td> <td>1.9</td> </tr> <tr> <td>63</td> <td>3.3</td> </tr> <tr> <td>75</td> <td>5.0</td> </tr> </tbody> </table>	Siphon size (mm)	Flow (L/sec)	50	1.9	63	3.3	75	5.0
Siphon size (mm)	Flow (L/sec)								
50	1.9								
63	3.3								
75	5.0								
Head (water level in the head ditch above the field) doesn't make much difference to siphon flow.	<p>Again, this is not correct, as shown by the figures below using the example of a 63 mm siphon. An increase of 0.2 m of head increases the flow rate from 1.9 to 3.3 L/sec</p> <table border="1" data-bbox="1086 1585 1465 1720"> <thead> <tr> <th>Head (m)</th> <th>Flow (L/sec)</th> </tr> </thead> <tbody> <tr> <td>0.1</td> <td>1.9</td> </tr> <tr> <td>0.2</td> <td>2.7</td> </tr> <tr> <td>0.3</td> <td>3.3</td> </tr> </tbody> </table>	Head (m)	Flow (L/sec)	0.1	1.9	0.2	2.7	0.3	3.3
Head (m)	Flow (L/sec)								
0.1	1.9								
0.2	2.7								
0.3	3.3								
Over irrigation is cheap insurance for good crop yield	The adage that if a little is good, a lot is better, does not apply where irrigation is concerned. Apart from the extra cost of using more water than is necessary, water is our scarcest resource. Also, over irrigation can flush nutrients below the root zone making it unavailable to plants and having possible environmental effects. Over irrigation can also lead to localised water logging which suppresses plant growth and yield.								

Acknowledgment. This is an edited version of a fact sheet from the Irrigation Toolbox series published by [Cotton Research and Development Corporation](#) (accessed 17 January 2022).

SIX MONTHS TO GO TO THE SOUTHERN HEMISPHERE'S BIGGEST-EVER IRRIGATION EVENT

In October this year, the Australian irrigation industry will showcase itself to the world in a weeklong demonstration of why it is regarded as a leader in irrigation practice and technology and policy development.

Irrigation Australia and its partner organisation the International Commission on Irrigation and Drainage (ICID) are combining forces for this unique event. Irrigation Australia is organising its Conference and Exhibition while ICID is organising its 24th ICID International Congress and 73rd IEC Meeting.

The theme of the Irrigation Australian Conference program is "Irrigation for the Future – Challenges, Innovations and Opportunities". Delegates will be able to attend sessions in seven program streams across both the Irrigation Australia and ICID programs.

The congress, conference and exhibition will be held at the Adelaide Convention Centre, and there will be a range of technical and partner tours on offer and a fun night for all at the Outback Spectacular dinner.

These concurrent events will draw a significant audience and expert presenters from Australia and around the world. With organisers expecting to host more than 1,500 delegates from more than 60 countries to attend the congress as well as the Australian conference, the event provides an unprecedented opportunity to share ideas, knowledge and best practice between Australia and the world.

CONFERENCE REGISTRATIONS NOW OPEN

For information about registering for the Irrigation Australia Conference go to website www.icid2022.com.au.

Early bird registration rates are available until Friday 1 July 2022.

The congress, conference and exhibition will be held at Adelaide Convention Centre.





Grundfos is sponsoring the workshop on energy transition and agriculture.

Workshops and special events a feature

As well as the conference and congress program, workshops dealing with issues that are set to have a big impact on the future of irrigation and the sustainability of agriculture and water supply have been introduced to the program.

The energy transition and agriculture. COP26 has dominated the news cycle recently and the road to Net Zero is an important issue for Australian agriculture. Energy costs are a significant component of farm operating costs and, to catch up with the latest on this topic, a half-day workshop titled The Energy Transition and Agriculture has been included on the Irrigation Australia Conference program Thursday 6 October 2022.

Agriculture is set to prosper from Australia's energy transformation. If planned well, farmers will cut costs, reduce emissions and build business resilience both on farm and through hosting large scale solar and wind developments. But there are a few changes that need to happen first.

Participants at this session will learn about how farmers are taking advantage of renewables, what else can be done to support their transition, how microgrids could be enabled by a modernised grid and opportunities from combining solar farms with agriculture.

We are pleased to announce that Grundfos Australia will be the sponsor of this important workshop.

We have been fortunate to secure the services of Karin Stark who has agreed to be the coordinator/chair of this workshop. Karin's international and professional history combines 20 years of engagement with communities around contemporary environmental issues such as waste, sustainable travel and clean energy. She has a Degree in Environmental Science and Sustainable Development and worked in WA before moving to the UK and finally settling to live on her partner's family farm in Narromine, NSW. Australia's largest solar diesel irrigation pump was installed on her farm in 2018 and she founded the National Renewables in Agriculture Conference and Expo in 2019, to share their story and help others take advantage of the benefits renewables provide.

Integrating fish into irrigation. Another important topic this year will be a special half-day workshop on integrating fish into irrigation. This session is supported by The Food and Agriculture Organization of the United Nations (FAO), World Fish, International Water Management Institute (IWMI), Charles Sturt University (CSU) and sponsored by the Australian Centre for International Agriculture Research (ACIAR).

Fish-friendly agricultural water management offers a way to enhance the productivity of water, in parallel with progressing towards environmental and food security goals. Engineering solutions (such as fish passages) can help mitigate adverse impacts of irrigation, but they are only one part of the complex and multidisciplinary approach that is needed to achieve multiple policy objectives (e.g. food security, enhanced nutrition, restored ecosystems and secure rural livelihoods).

Solutions to integrate fisheries and irrigation therefore need to bring together engineering, agronomic, environmental, and social interventions, and operate across scales from field to river basin. This special session will explore recent advances in knowledge and practice of fish-friendly irrigation and discuss ways to overcome technical and institutional barriers to widespread application.

Geosynthetics event. In collaboration with Irrigation Australia the International Geosynthetics Society (IGS) have agreed to host a one-day workshop on Tuesday 4 October on enhancing the performance of canals, reservoirs and dams using geosynthetics.

Geosynthetics have been used successfully in construction for decades. They offer cost-effective and durable solutions for numerous applications in geotechnical engineering. Sealing products are used in dams, reservoirs and canals to control seepage, avoid erosion, stabilise banks, or to ensure structural integrity. Additional benefits include a reduction of the carbon footprint of construction and a lowering of the long-term costs associated with their maintenance.

The full-day workshop offered by the Technical Committee on Hydraulics (TC-H) of the International Geosynthetics Society (IGS) will focus on how geosynthetics reduce water losses in irrigation and agriculture-related applications, canals, water reservoirs, and dams.

The IGS is a learned society dedicated to engineering education in the proper use of geosynthetic materials to improve infrastructure and support sustainability measures.

Delegates who register for the Geosynthetics conference will have access to the full conference program for both the ICID Congress and Irrigation Australia Conference.

Women Working in Irrigation

Irrigation Australia is excited to announce a new forum at the event that recognises the important and often unrecognised role that women play in the international irrigation and drainage community. The Women Working in Irrigation Forum, which will consist of a breakfast and panel discussion, is supported by the Australian Centre for International Agricultural Research (ACIAR). Further details including speakers and the program will be announced soon.

Extensive technical tour program

Irrigation Australia is currently calling for expressions of interest to attend the below tours so it can assess interest in and the viability of running them.

- Langhorne Creek – Water, Wine and Wetlands
- Adelaide Desalination Plant, Willunga Basin Water and McLaren Vale Wastewater Irrigation
- Goolwa – Where the Murray meets the Sea
- Adelaide Airport, Oaklands Stormwater Harvesting Project and Tonsley Innovation Precinct
- Northern Adelaide Irrigation Scheme and Salisbury Stormwater Harvesting
- Regional NSW incorporating Murrumbidgee and Colleambally Irrigation (modernised channel systems), environmental watering
- Western Australia, focusing on dairy farming, orchards, truffles and vineyards

Further details about each tour and the expression of interest form are available via the [conference website](#)



The exhibition promises to be an enormous showcase of the latest in irrigation technology and services from Australia and around the world.

A unique opportunity to showcase your products and services

With six months to go, Irrigation Australia CEO Bryan Ward is encouraging organisations that are considering attending to book their exhibition space.

The exhibition promises to be an enormous showcase of the latest in irrigation technology and services from Australia and around the world. With organisers preparing for 2000+ exhibition visitors, many of them product buyers and specifiers, this event will be a unique opportunity in the southern hemisphere to meet potential and current customers.

“Major companies such as Goldtec Control Systems, HTM Complete and Brown Brothers Engineers have already signed up and many more are currently considering package options,” said Bryan.

Organisations interested in exhibiting can download the prospectus from the [event website](#).



24th ICID INTERNATIONAL CONGRESS 73rd IEC MEETING

3RD OCT - 10TH OCT 2022
ADELAIDE | SOUTH AUSTRALIA



INTERNATIONAL CONFERENCE & EXHIBITION | 5TH OCT TO 7TH OCT 2022

Event Supporter



Meet People From



Registration Now Open

Irrigation Australia is proud to join with the International Commission on Irrigation & Drainage (ICID) for their 24th International Congress & 73rd IEC Meeting and we look forward to welcoming delegates from around the world to Australia in 2022 for this international conference on irrigation and drainage.

Why attend?

- Visit the exhibition and meet with the industry leading suppliers of irrigation & water management technologies.
- Hear from the leading researchers and experts in the field of irrigated agriculture and drainage.
- Build strong relationships with industry suppliers and professionals.

Why exhibit?

The combined 2022 Irrigation Australia and International Commission on Irrigation & Drainage (ICID) conference and exhibition will bring people from up to 78 countries representing 90% of all irrigated land, to Adelaide in 2022 – can you afford not to be there?

ICID Conference Theme

Innovative Research in Agriculture Water Management to Achieve Sustainable Development Goals

Irrigation Australia Conference Theme

Irrigation for the Future – Challenges, Innovations and Opportunities

- Visit the event website at www.icid2022.com.au for further information.

Expected Participation

1500+

Conference Delegates

2000+

Exhibition Visitors

FOR MORE INFORMATION
www.icid2022.com.au

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THE MURRAY–DARLING BASIN PLAN – COURTS AND WATER USE

SNAPSHOT

- The Murray–Darling Basin Plan is a statutory plan made under the *Water Act 2007* (Cth) to improve the health of the Murray–Darling Basin by setting aside water for the environment
- Currently the Basin Plan has set the amount of water to be secured for the environment at 2,145 GL – far lower than the 3,000 to 7,600 GL per year that initial research showed was necessary for sustainable environmental flows
- Hypothetically, the legal validity of the Basin Plan could be challenged through a judicial review, where one may argue that the *Water Act* does not give the Murray–Darling Basin Authority power to create a Basin Plan that is not sustainable
- In practice, however, not following a law when making a decision does not automatically render it invalid. Determining that the Plan is invalid would lead to major public inconvenience, which represents a significant challenge to a plaintiff seeking to attack it.

The court weighing in on the cancellation of Novak Djokovic’s visa was a recent example of how the courts function to keep a check on government power, a process known as ‘judicial review’. In *Djokovic v Minister for Immigration*, the Federal Court of Australia held that the power to cancel a visa for ‘public health, safety and good order’ under the *Migration Act 1958* (Cth) permitted the minister to cancel Djokovic’s visa as an unvaccinated sportsperson.

Migration matters are just one type of executive power that the courts can engage with and decide whether a decision was made in accordance with a given law. Water law is an area where courts have a role to play in ensuring that the decisions of the relevant minister and statutory bodies are consistent with what is authorised by legislation.

The Murray–Darling Basin Plan (Basin Plan) is a statutory plan made under the *Water Act 2007* (Cth) (*Water Act*) to improve the health of the Murray–Darling Basin by setting aside water for the environment. However, what if the Basin Plan did not achieve this aim? If a decision has been made without complying with the procedures set out in a statute, it may be invalid.



Photo by Zac Edmonds on Unsplash.

Could the Basin Plan be challenged?

This article looks at how a court would hypothetically consider a challenge to the legal validity of the Basin Plan if it were challenged on environmental grounds. Such a challenge would be a judicial review, similar to the Djokovic case, where one may argue that the Water Act does not give the Murray–Darling Basin Authority (MDBA) power to create a Basin Plan that is not environmentally sustainable.

The Water Act contains prescriptive requirements for the preparation of the Basin Plan. A key concept is sustainability. Viewed as a whole, the Water Act could be said to direct the preparation of a Basin Plan that delivers a sustainable Murray–Darling Basin. These environmental objectives under the Water Act are noted at section 3, including –

“...to ensure the return to environmentally sustainable levels of extraction...[and]... to protect, restore and provide for the ecological values and ecosystem services of the Murray-Darling Basin...”

Other sections in the Water Act make clear that sustainability is a requirement when creating the Basin Plan and deciding on sustainable diversion limits. For example, section 22 states that the Basin Plan must include ‘management objectives and outcomes to be achieved by the Basin Plan’, which must address ‘long-term average sustainable diversion limits’ and section 21 states that the Basin Plan is to be prepared in accordance with the National Water Initiative, which contains sustainability objectives.

When deciding what the Water Act actually allows, courts will also look at what parliament intended. For example, when the Water Bill 2007 was introduced into the lower house, then Minister for the Environment and Water resources Malcolm Turnbull noted that the Bill would ensure “clear pathways to return all water resources to environmentally sustainable levels of extraction”.

The Basin Plan set the amount of water to be secured for the environment each year at 2,750 GL target. This target has since been amended using the Sustainable Diversion Limit Adjustment Mechanism, and from 2019 the sustainable diversion limit has been reduced by 605 GL to 2,145 GL. Initial research and policy documents identified 3,000 to 7,600 GL per year being required to deliver sustainable environmental flows.

With a diversion limit under the Basin Plan substantially different to what is considered sustainable, would a court find the Basin Plan is not made in accordance with the Water Act and is invalid?

South Australian Royal Commission a guide?

If the findings of the [2019 South Australian Royal Commission](#) in relation to the Murray–Darling Basin Plan are anything to go by, the answer to this question is probably yes – the Basin Plan is invalid. In its report the Royal Commission relevantly concluded the following:

“In 2009, the CSIRO advised the MDBA that ... the MDBA should consider the recent climate of the past 10–20 years, and its climate change projections. This advice was ignored by the MDBA. This amounts to negligence, and maladministration.”

“The MDBA’s failure to heed the advice of the CSIRO, and to follow the requirements of the law, imposed by the Water Act, has not been explained and cannot be justified.”

“The process for determining the Basin-wide ESLT [Environmentally Sustainable Level of Take] was undermined by an incorrect construction of the Water Act, in particular the term ESLT. The MDBA has impermissibly adopted a so-called triple bottom line approach.”

The lawfulness of the Basin Plan is particularly relevant given the CSIRO predicted that by 2030, surface water availability across the entire basin is expected decline due to the impacts of climate change, with flows reaching the end of the Murray River being reduced by 24 percent.

It is worth noting that not following a law when making a decision or exercising power does not automatically render it invalid. The test from *Project Blue Sky Inc v Australian Broadcasting Authority* is whether it was the purpose of the legislation that such a breach should lead to invalidity. This is a problem with respect to an instrument like the Basin Plan because its invalidity would lead to major public inconvenience. Public inconvenience represents a significant challenge to a plaintiff seeking to attack the Basin Plan. It has been a decade since the Basin Plan was adopted, and longer still since its preparation commenced. Invalidity would result in great inconvenience to many parties. Water entitlement holders whose entitlements have been affected through the implementation of the Basin Plan would be significantly aggrieved.

Potential for challenge in the future

As water scarcity produces increased need for management, and competition for dwindling resources, challenging government decisions by way of judicial review for failing to meet the overarching goals of water legislation may become an increasingly viable and effective method for water users and communities.

Dr Joseph Monaghan, Partner at Holding Redlich, and Christopher Watt, Graduate at Holding Redlich. Joseph is a lawyer who practices in water law, having completed his doctorate on the Murray–Darling Basin Plan and Christopher has degrees in law and environmental science. Joseph can be contacted on joseph.monaghan@holdingredlich.com.

Irrigation design for agriculture

Irrigation design and management affects performance, yield and quality of crops. Irrigation design determines the efficiency and effectiveness of water use, and therefore influences business profitability. Irrigation professionals can provide advice on good design that may increase profits. In this article, Rohan Prince outlines the important aspects of irrigation design needed for an irrigation system that will suit the crop, farm and business needs.

IRRIGATION DESIGN CRITERIA

Irrigation design is a specialist job, and one of the best guarantees of expertise is Irrigation Australia's Certified Irrigation Designer (CID) scheme. A certified irrigation designer will need to know:

- any legislative requirements associated with the abstraction and application of the water being used, particularly about licencing and environmental issues
- the available or potential water volume along with quality parameters
- crop details and any details of crop effective root zone depth
- size and topography of area of water source and irrigation area
- soil survey information – soil type, texture, structure and chemical analysis
- climatic conditions near the proposed irrigation area
- power availability
- cultural or on-farm practices that may affect irrigation requirements (i.e. not spray on leaves, frequent soil cultivation, deep ripping)
- plans for future expansion of operations.

The designer will use this information to assess water supply options.

CROP WATER REQUIREMENT

A CID will calculate the seasonal water requirement based on crop stage demand and environmental conditions for the location being assessed. With a changing climate, a CID should use scenarios of hotter, drier years to calculate peak daily water requirements and a system able to deliver the right amount volume when required.

Soil structure influences the maximum infiltration rate of water into the soil, and this should determine the maximum irrigation application rate. If water is applied at a rate faster than infiltration, runoff will result.

An irrigation system also needs to be able to deliver the right amount of water in the period required. For example,

if a water sensitive crop requires 12 mm between 7 am to 7 pm, the implied application rate required is only 1 mm an hour. In practice, however, you may need to apply water over one, two, three or even four shifts to accommodate the soil's water holding capacity in the root zone of a crop. When combined with meeting the demand for different irrigation shifts throughout the farm, a significantly different application rates may be required.

Water quality may also influence the volume and type of system required. If irrigation water contains levels of salts harmful for the crop to be irrigated, extra water may be required to provide a leaching fraction. With higher levels of salts, it may also be desirable to limit spray on the leaves of plants so drip irrigation may be the preferred option.

The topography of the area will affect the hydraulic design of an irrigation system too. Increase in elevation results in pressure loss while decreased elevation results in pressure gain. A one-metre change is equal to approximately 10 kPa pressure difference.

Over an irrigation system's life, running costs are usually greater than capital expenses. Correct hydraulic design will limit the power wasted from unnecessary creation of pressure and incorrectly selected pumps.

Plans for future expansion may influence the size of pipes, the layout of the system and the capacity of the system to deliver a certain volume over a certain time. It is important for clients to discuss planned expansion with their designer.

There will always be the question about the cost and benefit of larger pipes and pumps. By using a CID and working through the design criteria in this document, irrigators may be able to assess the economics between the risk of crop or yield loss, and likely frequency of that risk occurring, versus irrigation system cost over its lifetime.

INVESTING IN A WELL-DESIGNED SYSTEM MAKES GOOD BUSINESS SENSE

A well-designed irrigation system often costs less and performs better than a poorly designed system due to lower running costs. Using a CID and designing an irrigation system that suits the crop, as well as soil, supply capacity and climate makes good business sense.

Acknowledgment. Thanks to WA Department of Primary Industries and Regional Development for permission to reprint this article in edited form. The article can be downloaded from the department's [website](#)


IRRIGATION DESIGN IS A SPECIALIST JOB

Whether a small or a large system is being designed, irrigation design is a specialist job, which is why Irrigation Australia's Certified Irrigation Designer program is important. A Certified Irrigation Designer (CID) has demonstrated the knowledge and experience required to design irrigation systems by passing a series of closed book, supervised exams. Irrigation is a large and diverse industry, covering irrigation applications from broadacre agriculture to residential gardens.



Design requirements vary widely across this range, so it is important that clients engage a designer who can demonstrate design skills, knowledge and experience in projects like the project being proposed. Irrigation designers are bound by a code of conduct, and to maintain currency of their certification, a CID must meet annual obligations to demonstrate continuing professional development, ongoing integrity, knowledge and compliance with industry standards.

For information about Irrigation Australia's certification process, go to the [website](#).



Irrigation design, which determines the efficiency and effectiveness of water use, is a specialist job for a professional designer.

Tasmanian Irrigation – a new approach to irrigation scheme project management

Tasmanian Irrigation is overhauling its approach to project management as the size and complexity of the next round of irrigation projects increase in capacity by up to tenfold.

After designing, building and managing 15 irrigation projects around the state, as well as taking over responsibility for a range of inherited assets, Tasmanian Irrigation is now planning or working on ten new irrigation projects as part of Tranche Three. Projects currently being progressed are the Don Irrigation Scheme, Northern Midlands Irrigation Scheme, Tamar Irrigation Scheme, Sassafras Wesley Vale Irrigation Scheme Augmentation, South East Integration Project, the South East Interim Solution and the Southern Midlands Irrigation Scheme.

It is expected that these projects will more than double Tasmanian Irrigation's current capacity of delivering 133,000 ML of high surety irrigation water per year.

Work underway on the South East Interconnect, one of the Tranche 3 projects.



INCREASED CAPACITY PROMPTS CHANGE TO PROJECT MANAGEMENT

One thing that has promoted a rethink on the approach to project management is strong demand from Tasmanian farmers, which means that new schemes are being designed with a capacity of up to 35,000 ML, compared to some of the 3,000 ML schemes constructed as part of Tranche One.

This means an entirely new approach to partnerships, flexibility, design, risk, safety, operability, efficiency, technology, governance, quality, communication and engagement.

Tasmanian Irrigation's Program Development and Delivery Team is responsible for delivering irrigation projects from concept to water delivery, ensuring schemes are designed to be in operation for the next generation of farmers and beyond.

Eric Shegog, the team's general manager, is leading the development of these projects.

"We moved from a design and construct approach to a design finalisation and construct approach. This gives contractors more certainty and Tasmanian Irrigation more control over design outcomes, incorporating lessons learned from previous schemes.

"Design specifications have been standardised for engineering, hydraulics, electrical plans, pumps, pipelines and dams, leading to a more consistent system control and data acquisition, as well as assisting with water delivery and asset management operations," he said.

GHD and Pinion Advisory were appointed as contractors in August 2021 and are designing the infrastructure for Tranche Three projects, including pipelines, tanks, dams and pump stations. They will also provide technical support during early project phases and construction and commissioning.

COMPLEXITY IN DEVELOPING A NEW SCHEME

Having developed the number of schemes that it has, Tasmanian Irrigation understands the complexities involved and has developed a systematic approach based on the following steps:

- community consultation
- expressions of interest
- launch of preferred design option
- water sales
- contracts with landowners
- final design
- business case
- permits and approvals
- construction
- commissioning.

Tranche Two Projects	Cost (\$ million)	Capacity (ML)	Pipeline (km)	Dams	Pump Stations	Power Stations
Duck	29.98	5,200	62	1	2	0
North Esk	30.43	4,680	63	1	2	0
Scottsdale	57.27	8,600	92	1	1	1
Southern Highlands	31.26	7,215	58	1	3	0
Swan Valley	18.88	2,000	37	1	1	0
TOTAL	167.12	27,695	312	5	9	1

Tranche Three Projects	Forecast Cost (\$ million)	Capacity (ML)	Pipeline (km)	Dams	Pump Stations	Power Stations
Don	Under tender	4,750	67	0	3	0
Sassafras Wesley Vale	69	13,686	95	0	5	0
Tamar	Under design	24,500	240	1	6	0
South East Integration	Under design	35,000	200	0	5	0
Southern Midlands	Under design	30,000	200	0	2	0

Along the way, risks are continually evaluated as the design progresses in terms of environment, social acceptability, cost and economic outcomes. As these schemes rely on a unique public/private partnership and funding model, all stakeholders are engaged and consulted to ensure key needs are met.

A focus on front-end loading to design viable and community supported schemes and meet irrigator demand is paramount, hence the consultation, expressions of interest and water sales phases. Being responsive to demand is important as demonstrated with the Northern Midlands scheme, which received expressions of interest for 13,000 ML, but water sales reached 25,500 ML.

“This means a complete re-design of the project and additional funding to build infrastructure to meet the demand,” said Eric.

CONSULTATION THE KEY

One of the challenges faced by Tasmanian Irrigation is securing contractors to carry out the on-ground work, as the state enjoys record infrastructure spending across rail, road and other projects.

“We have four \$300 million projects coming up, followed by another six irrigation projects,” Eric said. “We are already tendering a lot of work, so it is our key focus to ensure Tasmanian Irrigation is easy to deal with, shares the risk, has easy terms and conditions and a strong working culture.

This approach starts at the farm gate. Eric explained that, as an example, if they need to lay a pipeline through a farmers’ property, they go to the owners and collaborate on the best possible route to minimise impact on their farming operations, rather than turn up with a map and tell them where they are going to dig.

They also focus on building cost effective, low maintenance schemes, and looking at new options for automation and embrace technology.

Tranche One Projects	Cost (\$ million)	Capacity (ML)	Pipeline (km)	Dams	Pump Stations	Power Stations
Dial Blythe	14.4	2,855	44	1	2	0
Great Forester	4.5	1,980	0	1	0	0
Kindred / North Motton	10.6	2,500	44	1	2	0
Lower South Esk	12.7	5,298	1	1	1	0
Midlands	110.8	38,500	134	1	3	1
Sassafras / Wesley Vale	12.3	5,460	85	0	4	0
South East Stage Three	33.0	3,000	134	1	3	0
Upper Ringarooma	28.0	5,700	39	1	2	0
Whitemore	11.3	5,500	38	1	2	0
Winnaleah Augmentation	10.8	3,700	15	1	4	0
TOTAL	248.45	74,493	534	9	23	1

INVESTMENT PAYS OFF

Rob and Jane Dent, farmers at Oaks in northern Tasmania, were offered the opportunity to invest in the Whitemore Irrigation Scheme – one of the original Tranche One projects – in 2010.

“We went up to visit a farmer at Numurkah in northern Victoria who we had contracted to grow pearl millet, a robust annual grass,” Rob recalled.

“He was paying \$3,000 a megalitre then for irrigation water with only 30 percent surety and that year had received a 20 percent allocation.

“When we told him we had an opportunity to purchase irrigation water at \$1,100 a megalitre at 95 percent surety, he told us we were mad not to commit.

“So, we returned home, invested almost half a million dollars into 400 megalitres, ordered pivots and underground pipes – and never looked back.”

Rob and Jane now grow more than 30 varieties of seed crops across 240 ha of their own land, as well as on an additional 150 ha of contracted farms in New Zealand.

They said it was important that all Tasmanian Irrigation schemes are designed to last at least 100 years and deliver water at an annual average reliability of more than 95 percent.



Acknowledgment. Article provided by Tasmanian Irrigation

Effects of irrigating with saline water on soil structure

SNAPSHOT

- Sodidity is the name given to water or soil that has a high concentration of sodium compared with calcium and magnesium
- Sodification of the soil can be a problem in some irrigation areas, particularly where groundwater or recycled water is used for irrigation
- Sodidity affects soil structure, resulting in surface crusting, and consequently poor infiltration, increased run-off, and poor seedling emergence
- Soil irrigated with groundwater should be tested regularly to assess soil structure
- Good irrigation design can prevent this problem: surface and groundwater should be mixed for irrigation; application of gypsum and increasing organic matter in the soil can also help.

Sodification of the soil can be an issue in some irrigation areas, especially northern Victoria, because of groundwater use, and where recycled water is used for irrigation. The potential risk of sodification is one factor to be considered when designing irrigation systems in high-risk areas.

By applying water of a high salinity, you not only increase the risk of soil salinity, but the level of sodium within the soil. This is known as sodification of the soil. Sodification is a problem because it results in surface crusting and consequently poor infiltration of irrigation water or rainfall, increased run-off and poor seedling emergence.

WHAT IS SODICITY?

Sodidity is the name given to water or soil that has a high concentration of sodium compared to calcium and magnesium.

Water is said to be sodic when the ratio of sodium to calcium and magnesium, known as the sodium adsorption ratio (SAR), is greater than 3. Soil is said to be sodic when the sodium exchangeable percentage (ESP) is greater than 6.



Increased surface crusting can be a sign of sodicity.

Exchangeable sodium percentage is the amount of exchangeable sodium that can be replaced by another ion, such as calcium. Above this value, soils are likely to break apart (disperse) in water if soil salinity is low. These values are not definitive and should be used only as a general guide.

Salinity, clay content and other soil chemical measures also influence the extent to which sodicity will affect soil structure. Soil structural decline is more pronounced on heavier soil types such as Goulburn clay loams.

Ironically, salinity actually reduces the effect sodium has on the development of poor soil structure. It provides a stabilising influence on the soil. This means that with increasing salinity, higher concentrations of sodium can be tolerated by the soil. However, too high a salt or sodium content can be toxic to plants.

CAUSES OF SODICITY

When irrigating with saline water, the sodium ions displace other more useful ions such as calcium and magnesium. The higher the salinity of irrigation water, the greater the impacts on soil structure. If irrigation with saline water is continued, over time the soil becomes concentrated with sodium.

When fresh, less saline, water is applied, clay bonds become weak. The weakening of the bonds results in the swelling of clay particles, which then disperse, forming a soil with little or no structure. The clay particles move through the soil, clogging pores and reducing the volume of water that can move into or through the soil profile.

THE DIFFERENCE BETWEEN SALINITY AND SODICITY

Sodicity is often confused with salinity. Salinity is the total concentration of salts dissolved in water or soil. It affects the ability of plants to extract moisture from the soil. Soil salinity develops through the accumulation of salts, predominantly sodium chloride, and is measured by their electrical conductivity (EC).

Sodicity affects plant growth by altering the soil structure. Poor soil structure occurs when clay particles clog soil pores leading to surface crusting, reduced water infiltration and causing low aeration of the soil profile. As a result, less water is available for plant growth.

Irrigating pastures with saline groundwater (greater than 800 EC on a Lemnos loam) over summer will result in high soil salinity and sodicity. When channel water irrigation or winter rain follows, the salts are washed down the profile and soil salinity can be reduced to the point where the soil particles disperse.

Irrigation with saline water is stopped after a number of years and is followed by freshwater irrigation or rainfall. This results in low soil EC and potentially poor soil structure. This will most likely occur when groundwater salinity becomes too salty or there is a change in crop.

IDENTIFYING A SODICITY PROBLEM ON YOUR FARM

Sodic soils may develop slowly over a number of years. Visual signs that sodicity is present on your farm may include:

- increased run-off from pastures, due to decreased infiltration
- poorer emergence of seedlings
- increased surface crusting
- increased soil strength in dry sodic soils.

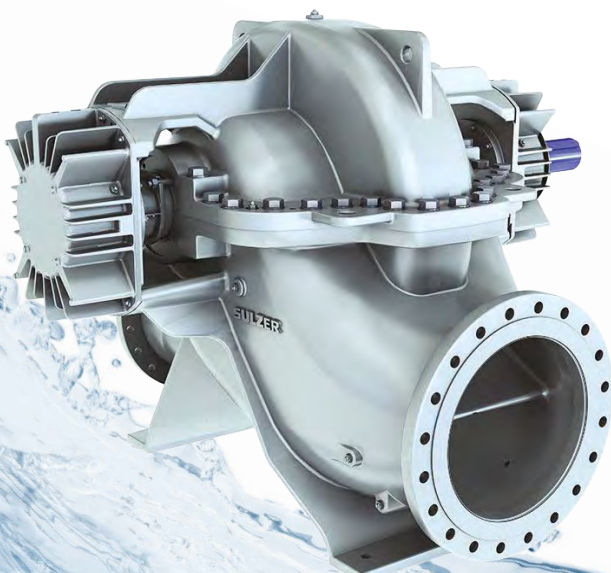
MANAGEMENT TECHNIQUES

Good groundwater practices mean:

- less money and time spent applying gypsum
- more water available for plant growth
- increased plant productivity
- more efficient irrigation.

Mixing of groundwater and surface water supplies through the whole irrigation season creates a balance between leaching salts from the soil profile and maintaining the right soil salinity to stabilise sodic soils. Applying gypsum and increasing soil organic matter are additional methods used to stabilise fragile sodic soils.

Irrigation design. Shandyng groundwater to 800 EC units at every irrigation will ensure that soil structure is maintained. Alternating between straight groundwater and channel water irrigation or starting the season with straight groundwater irrigation will increase the chances of soil structural problems developing over time.



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GOOD DESIGN AND INSTALLATION

When irrigation with saline water is followed by freshwater irrigation or rainfall, this can result in low soil EC and poor structure. Photo by Roman Synkevich on Unsplash.



Soil tests. It is recommended that soils receiving groundwater be tested on a regular basis to assess soil structure. A typical soil test will determine:

- exchangeable sodium percentage (ESP)
- soil salinity
- clay dispersion
- soil organic matter content
- soil texture
- soil Ca/Mg ratio.

Land forming on sodic soils. Land forming on sodic soils increases the risk of reducing soil structure. Sodic soils are less able to tolerate physical disturbance. Applying gypsum to the soil during land forming aids in stabilising the soil.

Using gypsum or lime to improve soil structure. Short to medium term improvement in soil structure is achieved by applying gypsum (calcium sulphate) to the soil. Gypsum replaces the sodium on the surface of clays with calcium and it reduces surface clay dispersion and subsoil swelling. The sodium released in the chemical reaction is leached below the root-zone.

Gypsum is best applied to soils during land forming and before sowing pastures. It should also be applied on a more regular basis after the summer irrigation season before the onset of winter rains. The amount and regularity of gypsum

application is best determined by soil tests every one to two years.

Lime (calcium carbonate) acts in the same way as gypsum: it improves soil structure but may act more slowly. Lime is best suited on soils with a pH less than 6.5.

Organic matter content. Increasing the amount of organic matter in the soil profile will help to bind the soil together. You should aim to have more than 2 percent organic carbon levels in your topsoil (0-10 cm).

REFERENCES

- Surapaneni A, Olsson K and Hall R. Understanding soil sodicity. Soil Sense Note Number C-14.
- Bethune M.G. and Batey, T.J. (2001). Impact of soil hydraulic properties resulting from irrigating saline sodic soils with low salinity water. Australian Journal of Experimental Agriculture, 2002, 42, 273-279.

Information. For more information on managing your groundwater to prevent the development of unstable soils contact Nick O'Halloran at Tatura on (03) 5833 5222.

Acknowledgments. This article was originally published on the [Agriculture Victoria website](#). Thanks to the Natural Heritage Trust, Goulburn-Broken Catchment Management Authority and the Department of Natural Resources and Environment.



ANNE CURREY HANDS THE BATON ON

After 25 years as editor of the *Irrigation Australia Journal*, Anne Currey has made the decision to hand the baton on and retire.

Anne has made a significant contribution to the irrigation industry, Irrigation Australia and its predecessor IAA over many years. Her name has appeared in every edition of the *Irrigation Journal* since 1997 as a contributor and editor.

CEO Bryan Ward says Anne will be missed, "I am sure that the many people that Anne has worked with over the years would agree that she has been the ultimate professional and a person of high personal and professional standards.

"She has this wonderful knack of getting a large number of people to contribute copy in every journal, and somehow managing to stay cool, calm and collected with deadlines approaching. This takes a particular skill!"

Anne has put many thousands of hours of work into the journal over the years and has made continual improvements along the way, "The amount of work that goes into the production of the industry journal is not well understood, and she not only met the deadlines but constantly improved the publication. Our new editor Eve White now takes over and she is fortunate that Anne will continue to provide advice and assistance when required," Bryan says.

Irrigation Australia Journal spoke to Anne about her time in the irrigation industry and what she plans to do in her retirement.

IA. Can you tell me about some highlights or stand-out memories from working on the journal?

Anne. There are lot of memories from my 25 years (wow, I just realised that is a quarter of a century!) of editing and managing the journal. I've met a huge number of great people whose company I have enjoyed and from whom I have learned much.

I've been able to travel to some amazing places in Australia and overseas because of my role with the journal. A trip to the Ord in 1999 is a particular memory – meeting the people who were pioneer irrigators, the immense size of Lake Argyle and the remoteness of the area were extraordinary. A visit to the Midlands in Tasmania provided an interesting contrast. Also unforgettable was a trip to Israel to attend WATEC in 2007, where Shimon Peres spoke, and to visit kibbutz Naan and kibbutz Magal, where I was shown great hospitality.

And, finally, the biennial conferences and expos have been great opportunities, at one level to learn a bit more about irrigation, but more importantly, to meet and socialise with people in the industry.



IA. How has the journal changed over the years?

Anne. The journal has changed hugely over the years. When I took it over it was a slim black and white publication that relied a lot on reproducing copy from other sources. Since then and with the support of the five IAA/IAL CEOs I have worked with, I have been able to build it into the four-colour, well-regarded publication that it is now. Of course, it's not only my effort that has done this. Brian Rault works tirelessly selling ads to advertisers of varying levels of enthusiasm and Annette Epifanidis has applied her creativity to ensure each issue is attractive and readable.

One thing that hasn't changed is the support I have received from the Irrigation Australia Board and Bryan (and his predecessors), who have, happily, pretty much let me run my own race with the journal.

IA. As the editor, you get a broad and objective view of the industry. From your editor's-eye-view, what changes have you seen in the irrigation industry over the years?

Anne. Editing and managing the journal over 25 years has given me the opportunity to experience and report on a period of much change in water policy and how irrigation is practised in Australia. Change is not easy for many people, whatever the circumstance, and this certainly has been the case with irrigation and water in the last 30 years. At times, I believe that some representatives have not encouraged people to acknowledge the inevitability of and opportunities in adaptation. Many of the stories in the journal show that people have been able to take advantage of and prosper from doing just this.



IRRIGATION AUSTRALIA NEWS

Another significant change is that of communications technology allowing remote collection of data in real time. Huge benefits have come from this in terms of water use, the natural environmental and decreasing costs. This will continue to be an interesting area to watch with advances now being made in applying AI.

IA. What will you be doing with your free time?

Anne. There are so many things on the list. I've got several shelves of books to read, years of photos to classify, friends and relatives to visit and make a nuisance of myself with, a garden to keep building and a mind to keep active. Jeremy (Cape) and I love to get out and go walking and biking, so we are busy planning our next bike ride, along the Munda Biddi trail (assuming WA has opened). There are a few others on the list like the Tasmanian Trail and the Sultan's Trail.

Finally, I'd like to acknowledge and say thank you to all the people who have supported me in this 25-year journey – the board, Bryan and his staff, members who have written articles, the advertisers and my partner Jeremy Cape, who has been sounding board and great source of information about things irrigation.

I think it's wonderful that Eve is taking over my role. She will do a great job, and with her fresh eyes, no doubt put her stamp on the journal and make it even better.

FIND AN IRRIGATION SPECIALIST

If you are looking for an irrigation specialist, then the Irrigation Australia website is your one-stop-shop. Just type in a postcode and irrigation professionals listed in the area will be shown, along with their contact details.



REGIONAL ROUNDUP



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

Queensland. In December the Queensland committee hosted an end-of-year event for 31 members who enjoyed networking over a hot brekkie roll and barista coffee. This was followed by a presentation and tour of the Valmont irrigation facility in Darra.

Several active members of the committee have relocated, and new members are needed to fill their shoes. Members are needed to help support the irrigation industry by engaging in activities that ensure that the industry is front and centre of decision makers' minds; supporting initiatives that promote water conservation; identifying local industry training needs; providing governance for the industry; and most importantly, being a point of contact for members to discuss issues related to the irrigation industry.



The Queensland committee hosted an end-of-year event for 31 members, which included a tour of the Valmont irrigation facility in Darra.



Western Australia. The WA committee has been wrapping up its Waterwise activities for 2021 and is looking forward to rolling out new and improved programs later this year, in collaboration with Water Corporation. The committee has also been having productive discussions with Busselton Water about promoting and expanding the Waterwise programs.

The first member event for 2022 will be held on 16 March at Woodchester Reserve, Nollamara. The site contains sporting grounds used for soccer and amateur football, along with a long-jump pitch. The presentation will showcase the capital works required when an irrigation system reaches its end of lifecycle and is due for replacement.

Irrigation Australia WA has been contracted by Water Corporation to deliver three Waterwise garden workshops at the Perth Garden and Outdoor Festival in May. These workshops, which will be promoted on social media in the lead up to the event, will focus on:

- water efficiency in turf management and turf alternatives (e.g., verge gardens, native grasses, groundcovers)
- sprinkler and sprinkler run times
- soil improvers such as soil wetting agents.



To learn how your business can become a Waterwise Professional, contact Irrigation Australia on (08) 6263 7774 or visit the [Waterwise website](#).

Melbourne. In December, the Melbourne regional committee organised a Christmas breakfast, attended by 80 irrigation professionals. The event, sponsored by 19 companies, was held at Italian restaurant Sette Bello in Glen Waverley.

The committee has been having monthly meetings with the Water Businesses Working Group to plan the best-practice workshop, which will showcase knowledge on best practice for municipal irrigation, covering sites such as sporting complexes and public open-space gardens. The workshop will be hosted by Western Water and Yarra Valley Water. Stay tuned to find out when this event will be held.

In November 2021, the Department of Land, Water and Planning asked for feedback on its Model Water Restriction By-law, which is up for review. Irrigation Australia lodged a submission based on Section 7 - Water Use Plans. We have not yet received a response, but we're hoping to have further discussions with the Department about the submission.

Tasmania. The Water Efficiency Field Day that was planned for February was postponed to later in the year due to the COVID-19 outbreak in January. All exhibitors agreed to support the event at a later date. Registered participants were contacted and offered a full refund OR the option to hold their payment for the future event.

South Australia. After being approached by members who wish to support the association at a local level, we are pleased to advise that we have reinstated a regional committee for South Australia.

Josh Hill from the City of Port Adelaide Enfield has volunteered to lead the region as chair. Josh has worked

in the commercial and residential irrigation industry for 16 years, on all sides – from installation to consulting. Josh is looking forward to guiding the SA region to become a strong industry community that considers all sectors of the marketplace; engages with government agencies to discuss issues that are important to the irrigation industry and deliver interesting member events that support networking and knowledge transfer.

Committee members are:

- Adam Marling – Antelco
- Chris Simpson – Rain Bird
- Luke Behn – Think Water – Adelaide
- Alan Michelsen – Glenelg Irrigation
- Tyson Bennetts – City of Charles Sturt
- Kathryn Eden – Greene Eden Watering Systems

This newly formed committee met in February and has scheduled a calendar of events that will showcase domestic, rural, commercial and industrial sites of interest. Local members will receive invitations to these closer to the scheduled dates.

Certification and training have also been a focus for the committee. Members are working on promoting the certification program to local government for adoption.

SA Members are invited to contact Josh Hill (Chair SA Region) to discuss any local industry-related issues that the committee should be involved with on behalf of the irrigation industry.

WATERWISE IRRIGATION PROGRAMS ON FACEBOOK

Have you checked out Irrigation Australia's Waterwise irrigation programs on Facebook?

Waterwise-endorsed members are fully trained in water efficient practices and can design, install, repair and maintain domestic irrigation systems.



There are two categories:

- **Waterwise Garden Irrigator** - for professional installation and maintenance services
- **Waterwise Irrigation Design Shop** - for expert advice and quality parts

The Facebook page aims to provide the wider community with #waterwise tips and advice and promote members.

Use the QR code and jump on Facebook to find out more and keep up to date.





IRRIGATION AUSTRALIA NEWS

NEW IRRIGATION AUSTRALIA STAFF

There have been a few changes in IAL staff in recent months. Two new staff members, Kasey and Tony, have joined the Brisbane office, and Bec in WA has been promoted to role of project officer.



Kasey Barton. If you call Irrigation Australia to inquire about training, it will likely be Kasey's friendly voice that you hear on the phone.

Kasey joined Irrigation Australia in November as training and administration officer. She has a strong administrative background and has a Certificate III in Business Administration.

She recently changed her career direction, motivated by her strong interest in training, "Before coming into training, I was in payroll for approximately 15 years," Kasey says.

Kasey developed an interest in training while working in payroll positions: "I realised that the time that I was happiest in my payroll career was when I was training colleagues and other staff, so I decided to start studying a Certificate IV in Training and Assessment."

Kasey is primarily involved with the administration of the training and certification program, including student enrollments and queries. She finds that her day-to-day work is varied, "There are always emails and phone calls regarding training; registering people for courses, follow ups and reminder emails for enrolment details and training dates; and publishing courses on our website and relevant systems."

"I enjoy the variety of work, learning how an RTO is run and different programs from Moodle to VETtrak."

Outside of work, Kasey prioritises family time, "I love to spend time with my husband and two boys as well as friends when I can find the time. We enjoy playing games, anything from board games, to card games to video games. I love to read novels though rarely find time to do it."



Tony Wilson. Tony took up the position of RTO training and compliance officer with Irrigation Australia in January. Tony is responsible for the administration of the training courses, from scheduling, marketing, enrolments, student

management and liaison with stakeholders/suppliers and ensuring the company's compliance responsibilities are met.

Tony explains, "My role is to ensure that all compliance training requirements and training standards are adhered to in accordance with state and federal requirements."

Tony comes well-qualified for this role with a Certificate IV in Training and Assessment, Diplomas in Management and Project Management and Certificates in Frontline Management, Personnel Recruitment and Government.

He has extensive experience in training, from logistics, project and records management to student management and has helped develop initiatives and policies relating to industry accreditation and ensuring compliance standards are adhered to.

Tony says, "My background within training and training administration has ranged from defence force training (in Australia, Iraq and Afghanistan), senior training coordination roles within a not-for-profit organisation and a non-profit membership-based organisation and state manager Queensland/Northern Territory within the corporate sector RTO."

Appropriately for someone who works in training, Tony says that one of the things he enjoys most about his work is the opportunity to develop his own skills, "Training and training administrator roles let me continually develop my own skills and technical ability, in particular within IT support platforms."



Rebecca New. Rebecca has been promoted to the position of WA projects officer. Bec joined Irrigation Australia in January 2020 in an admin support role and is responsible for delivering the WA activities. Being already well connected to members has placed her in a strong position to transition to her new role. Bec also administers the Waterwise programs for both WA and VIC.

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FILTERSAFE INTRODUCES ITS AUSTRALIAN TEAM

Filtersafe Australia and New Zealand recently officially opened in Adelaide. The office, which will service the Oceania region, specialises in filtration for agriculture, aquaculture, mining and other related projects and brings unique solutions to these applications to meet the needs of the local market.

The Filtersafe team is led by CEO David Thomson. After working in filtration for decades, David said he is excited about the opportunity to build the company's presence in Australia. "It is not often that the mechanical filtration industry, which is quite mature, has a big advancement, but Filtersafe's patents and systems are a game-changer," he said.

In addition to his role as CEO, David is focused on bringing Filtersafe's technology to the corporate agriculture sector.

The agricultural market is the largest user of water in Australia, and Filtersafe has years of experience filtering water directly from rivers, reservoirs, and other sources such as effluent for use in drip and sprinkler irrigation.

David said that the company offers extensive experience in a variety of agriculture and aquaculture applications, including high-flow filtration, filtering water sources with high loads of total suspended solids (TSS) and organic matter, and similar applications that are so important to corporate farms that rely on filters that run smoothly.

Filtersafe also provides filtration solutions for challenging seawater applications. Over the years, the filters have been independently tested and have shown unmatched performance handling very high TSS levels, in all water sources and conditions.

The second member of the team is Jamie Pickford, who brings his years of experience to serve industrial applications. Jamie has worked for 30 years in the water industry, in South Australia, New Zealand, Queensland, Western Australia and Indonesia. During that time, he has held various management roles that have focused on large industrial pumping and filtration projects for municipal, mining, aquaculture, agriculture and industrial applications.

Ronen Leyson, responsible for technical sales and support, rounds out the leadership team. His expertise is helping clients find the best Filtersafe product for their needs and providing support when needed.

To find out more, go to the [Filtersafe website](#).

HYDROPLAN JOINS PINION ADVISORY

HydroPlan has merged with agribusiness, water and environmental consultancy Pinion Advisory to create Australia's largest independent irrigation consultancy.

HydroPlan, established in 1985, specialises in the design, documentation, and construction management of irrigation projects across Australia and internationally. The team provides services to farmers, water utilities, sporting clubs,

local and state government, architects, developers, and engineers.

HydroPlan's project history includes:

- large stormwater harvesting and recycled water schemes
- multiple off-peak water storage projects, above and below ground
- stock and domestic pipelines in Victoria and New South Wales
- racecourse irrigation systems in Australia and Southeast Asia
- parks, public landscapes and golf courses in Australia and Southeast Asia

Pinion Advisory emerged in July 2020 with the merger of agribusiness, water and environmental consulting firms, Rural Directions, Macquarie Franklin and Sunraysia Environmental. The US-based agricultural advisory firm K-Coe Isom is also a partner, creating the world's first multinational agriculture, water and environmental consultancy business.

Since launching, Pinion Advisory has expanded five key service areas:

- The Pinion Centre for Family Agribusiness
- commodity risk management
- food and agricultural production
- water
- environmental management

Pinion's key clients include family and corporate farmers, government, developers and research and development corporations.

The merging of the HydroPlan and Pinion Advisory water teams will create additional capacity and expertise for existing and new irrigation developments, and the team will have offices in nearly every state of Australia.

Technical Director, John Gransbury celebrated his 35-year anniversary with HydroPlan last week. "We've completed over 12,000 projects, and my awesome team is very excited about the future and the additional capacity and expertise now available to clients" he said.



John Gransbury, Technical Director of HydroPlan.

Information. To find out more, contact Dave Heinjus, Pinion Advisory CEO, on 0417 808 557, or John Gransbury, HydroPlan Technical Director, on 0412 600 674.



PROFESSIONAL DEVELOPMENT

SNAPSHOT

- Geoff Harvey gives an update on training: demand is increasing; delivery of training is more flexible; and a new user-friendly app is now in use
- Raymond Blanch talks about his experiences with the Certificate III and meter validation and installation courses
- Peter Smith provides a metering update.

most courses now comprise a blend of virtual training, backed up with practical face-to-face training when this is possible. Some of the practical training requirements are also performed in each student's workplace, where they have the option of producing videos or other evidence of the work being performed. Alternatively, they can book an online meeting with their trainer/assessor to get signed off for their practical activities.

IRRIGATION AUSTRALIA TRAINING



A training update by Geoff Harvey, Irrigation Australia's National Training, Certification and Marketing Manager.

New app for students. Gathering evidence and capturing hours of work against trained competencies in their workplace is also much easier now with Irrigation Australia's introduction of 'Ready Skills', which is an expansion of our VETtrak student management system.

Ready Skills information can be captured through an app or on the student's computer, making it easy for students to input their activities and hours whenever it suits them.

Get qualified now to take advantage of the many opportunities in the industry

Demand on the rise. Demand for training continues to grow. More people are making this choice because they want to further their professional development within the irrigation industry, while others now require training where local legislation changes have meant they now need to be qualified to perform their irrigation work.

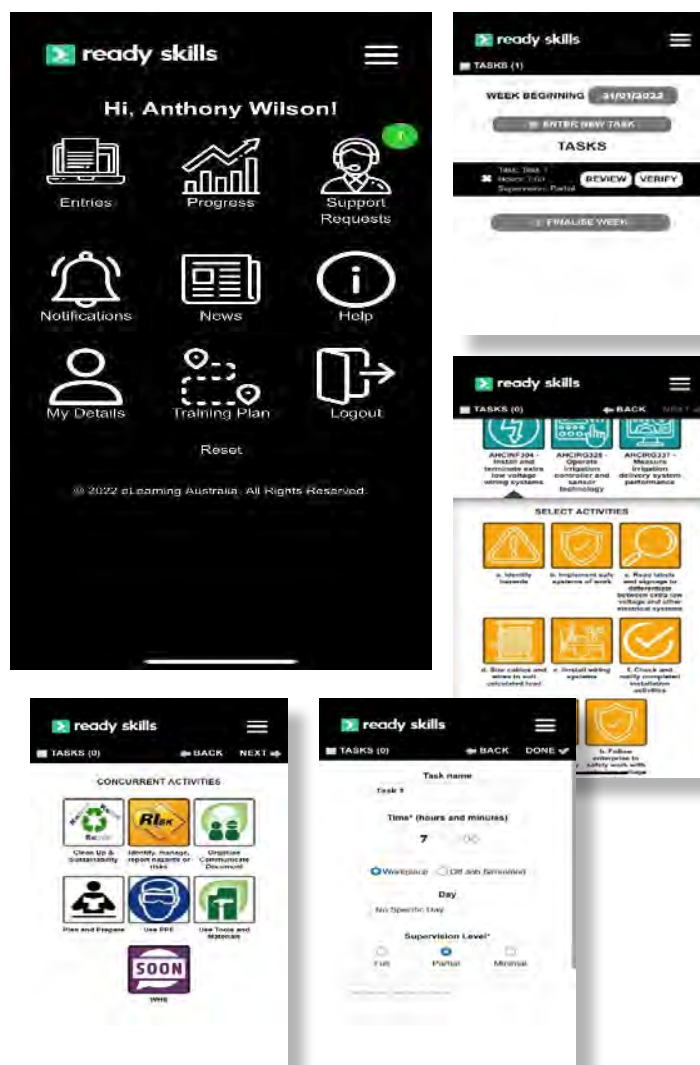
Lately we've been seeing more participants from local governments, consultancies, growers/farmers and contracting companies, not to mention recent school leavers who have opted to take on an exciting career within our irrigation industry.

This is certainly good news for the industry, which is recognising the need to have properly qualified and certified staff. The result is that not only do we have highly skilled staff, but this also improves our ability to attract the younger generation into what is a growing industry. There is undoubtedly a shortage of properly skilled people in our industry – as evidenced by the many enquiries we receive from members trying to find staff to meet their work demands.

This staff shortage can only be fixed if we all start to encourage the younger generation to consider the many great opportunities we have on offer in our industry.

There are many more options than ever before to get trained and qualified, so there is really no excuse not to put it off – it just takes determination and motivation to get it started.

Flexible training options. In response to COVID-19 restrictions over the past two years, Irrigation Australia has become more flexible with training delivery methods;



Screenshots of Ready Skills. This app makes it easy for students to enter their activities and hours whenever it suits them.

Become a Certified Meter Validator and Installer

The demand for Certified Meter Validators and Installers continues to increase, in part because the New South Wales Government has legislated that all rural water meters must be installed or validated, or both, by a Certified Meter Installer and Validator. The Queensland Government will likely follow suit – in some parts of the state a deadline is already in place to have rural water meters revalidated or replaced by 1 December 2022.

To cope with the demand for certified people, Irrigation Australia will continue to deliver more training courses, particularly in New South Wales and Queensland. If you are interested in becoming qualified as a Certified Meter Validator and Installer, don't delay. Some CMI training courses can be delivered virtually, with the practical requirements completed in the student's workplace. Irrigation Australia will also be offering some face-to-face training courses in limited locations in the coming months.

Register for one of these training courses through our [website](#).

DOUBLE CERTIFICATION FOR RAYMOND BLANCH

Raymond Blanch is an irrigation consultant at Gloucester Rural Supplies in New South Wales. He has been working in the industry for nine years and recently completed a Certificate III in Irrigation Technology and he followed up with a certification in Meter Validation and Installation. Raymond shared his thoughts on the courses with *Irrigation Australia Journal*.

IA. What motivated you to do this training?

Raymond. It was the idea of having a trade-level qualification that appealed to me – it's good to have your skills acknowledged in the area that you work in. Customers appreciate it too – it gives them confidence knowing that they're dealing with someone who has done extensive training and is certified.

IA. You completed the Certification III in Irrigation Technology and followed this up with a Certificate in Meter Validation and Installation. What contributed to this decision?

Raymond. In the Cert III, you learn a bit about meter validation – particularly about the rules and regulations, but you don't come out as a Certified Meter Installer and Validator. I elected to do the full meter course because the new metering rules are going to come into effect in the coastal regions in 2023.

Right now, no one around here does meter validation, so it seemed like a great opportunity to get involved and to

expand the business into this area. Because I'd already done the Cert III, I could get some credit for the coursework I'd done in meter validation; Irrigation Australia was very good about that.

IA. What can you tell me about the course structure?

Raymond. I was in the first group to do this course and it was when COVID was just kicking off. This meant that the theory part of the course was done on Zoom. To start with, I found this hard, but Irrigation Australia did a great job of adapting and making it possible for people in all different areas to do the course online. When restrictions eased we were able to get out and do the practicals.

IA. What is the most interesting or useful thing you learnt in this course?

Raymond. Not everything in the course was relevant to me – particularly the urban irrigation aspect, because I'm in a rural area. The stand-out parts for me were learning about the design and set-up of drip irrigation systems. This included a field trip to a vineyard. I found the soil science component interesting too, particularly learning about topics like different soil types and how much water to apply.





PROFESSIONAL DEVELOPMENT

PETER TALKS METERS



A metering update by Peter Smith, Metering Governance Officer, Irrigation Australia

Installation of Pattern Approved water meters is proceeding well in New South Wales. The compliance date for NSW Northern inland regions passed on 1 December 2021. However, recent floods and labour

shortages along with meter supply issues resulting from COVID-19 have been challenging for installers and irrigators, and not all meters have met the deadline. The next roll-out date is 1 December 2022 for inland southern regions, and installers who wish to become a duly qualified person should contact the Irrigation Australia office to discuss how to become certified.

Apart from those mentioned above, there are few reports of supply problems for meters and local intelligence devices (LIDs) and inquiries to me from CMIs/DQPs has dropped off – presumably because they are busy.

During periods of busy activity, CMIs/DQPs are reminded to complete validation certificates with care. This will avoid complications and possibly expensive fixes down the track.

The number of CMIs has increased in the past few months with many students completing their certification requirements. At the time of writing there is a total of 493 current CMIs of which 155 are in NSW, 138 are in Qld, 131 in Vic and 41 in SA. For a complete list and their details, see the Irrigation Australia [website](#).

There have been a couple of updates to the list of Pattern Approved meters in the last few months:

- NMI 14/3/32 Aquamonix Model I500 – amended 8/11/21
- NMI 14/3/36 Euromag Model MUT 2200 EL – additional variant 8/11/21

It is important for CMIs/DQPs to always check the PA certificate for updates and changes and to ensure that meter installations comply with the requirements. The list is available at the [Irrigation Australia website](#).

NSW

NSW Department of Primary Industries and Environment has produced two new factsheets:

- [Telemetry network coverage exemption](#)
- [Metering portable pumps](#)

And have updated another:

- [Information for DQPs](#)

Floodplain Harvesting is coming back into view with passing of the relevant legislation in the lower house of the NSW parliament. It must pass the upper house to be in force, but it appears to be heading this way. Stay tuned for more developments.

Information

For information about metering or if you have any metering issues or questions, contact Peter Smith at email metergovernance@irrigation.org.au, or phone 0455 973 780.

METERING FORUM

Have you checked out the new [Metering Forum](#) on the Irrigation Australia website? The forum contains a lot of information on metering, including for floodplain harvesting. Access is open to all and subscription is free.

Subscribers can also ask a question and we will find you the answer. If you subscribe you will also be notified when a new post is made. This site is recommended for all CMIs and CSVs (DQPs).

TRAINING DIARY

DATE	COURSE	LOCATION
1 to 4 March	Meter Validation & Installation (4 half-day sessions) - includes certification as a CMI (DQP)	Virtual classroom
15 to 17 March	Irrigation Pumps & Systems (3 half-day sessions)	Virtual classroom
22 and 23 March	Certificate III in Irrigation Technology - Block 1 (2 half-day sessions)	Virtual classroom
29 and 30 March	Certificate III in Irrigation Technology - Block 1 (2 half-day sessions)	Virtual classroom
29 March to 1 April	Irrigation Efficiency Course (4 days)	Perth WA
5 and 6 April	Certificate III in Irrigation Technology - Block 1 (2 half-day sessions)	Virtual classroom
11 to 13 April	Meter Validation & Installation (3 days) - includes certification as a CMI (DQP)	Wilsonton Qld
10 to 13 May	Irrigation efficiency course (4 days)	Perth WA
17 to 20 May	Meter Validation & Installation (4 half-day sessions) - includes certification as a CMI (DQP)	Virtual classroom
17 and 18 May	Certificate III in Irrigation Technology - Block 1 (2 half-day sessions)	Virtual classroom
24 and 25 May	Certificate III in Irrigation Technology - Block 1 (2 half-day sessions)	Virtual classroom
May (dates TBA)	Urban Irrigation Design	Virtual classroom
May (dates TBA)	Commercial Irrigation Design	Virtual classroom

IRRIGATION TRAINING INFORMATION AT YOUR FINGERTIPS

Check out Irrigation Australia's [new training course booklet](#). This comprehensive publication provides essential details on training courses offered by Irrigation Australia.

- Certificate III in Irrigation Technology
- Certificate IV in Irrigation Management
- Centre Pivot and Lateral Move
- Meter Installation and Validation
- Introduction to Irrigation | Agriculture
- Introduction to Irrigation | Urban
- Irrigation Pumps and Systems
- Irrigation Efficiency
- Urban Irrigation Design
- Commercial Irrigation Design
- IRRICAD Design
- Irrigation Installer
- Storage Meter Installation and Validation



CERTIFICATES III AND IV – REGISTER YOUR INTEREST

Certificate III in Irrigation Technology AHC32419 (trade level).

This qualification reflects the skills and knowledge required to become an irrigation installer, operator, retailer or technician for residential, commercial or agriculture industries. This is an in-depth irrigation training program which is assessed against nationally recognised Competencies towards Certificate III in Irrigation Technology AHC32419 (Trade Level). The program also uses subject matter experts for specialised topics such as hydraulics, troubleshooting and basic irrigation design.

Interested? Register [here](#).

Certificate IV in Irrigation Management AHC41119 This qualification reflects the technical and supervisory skills and knowledge required to operate as supervisors and specialists in the irrigation industry. It applies to irrigation installation site managers and managers of irrigation systems in the irrigation servicing, horticulture and agriculture industries.

Interested? Register [here](#).

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SUBMERSIBLE VERSUS TURBINE PUMPS – PROS AND CONS OF EACH

SNAPSHOT

- This article looks at the costs and other variables to consider when choosing which pump to use for pumping groundwater
- There has been a recent shift away from vertical turbine pumps in favour of submersible pumps – but submersible pumps may not always be best for the job at hand
- The design of submersible pumps has improved in recent years: they can now operate at higher speeds and higher flow rates, and owing to larger flexible rising main, installation is easier and cheaper, and pumps are more reliable
- Vertical turbine pumps are more complex, with a long drive shaft and many bearings, but recent advances in material and manufacturing technology have simplified some aspects of turbine pumps and increased bearing life
- The biggest cost associated with pumps is electricity use; both submersible and vertical turbine pumps can use renewable energy
- While the initial outlay for a vertical turbine pump is higher, over the long term, significant savings can be made due to lower running costs.

When it comes to pumping groundwater, there has been a recent shift away from vertical turbine pumps in favour of submersible pumps. However, vertical turbine pumps show clear advantages in terms of energy efficiency. This article, provided by Sterling Pumps, looks at some of the pros and cons of each.

Submersible pumps

A clear shift is underway in terms of how we approach pumping of ground water. This is due to the development and availability of higher-speed and higher-flow submersible pumps. Developments in hydraulic design have allowed pump manufacturers to dramatically increase the speed of larger pumps and keep suction requirements within reasonable operational limits without sacrificing efficiency.

Flexible rising main is now available in larger sizes, and this has simplified the installation process, increased reliability, and reduced the overall cost of a submersible pump installation. Submersible pump projects that once needed heavy-lifting equipment and days of work can now be installed and running within a morning.

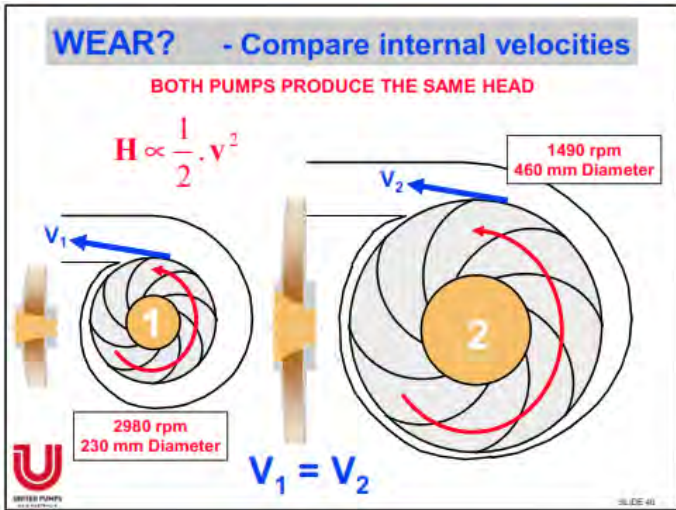
Submersible pumps and motors are often available from manufacturers' stock on short lead times, so the time between investment decision and operation is very short. This is particularly important when an old turbine has failed, and water is needed urgently.

Historically, two-pole high-speed pumps were limited to about 100 L/s, but recent design improvements and hydraulic modelling have allowed designers to achieve flows up to 200 L/s. Four-pole motors, which have a long delivery time, are now rarely used and are only seen in very high-flow and lower-head applications.

Some of the design advances stem from the acceptance that slower speed does not always equal lower wear and longer life. It might seem logical that a good old slow-speed pump will last longer than a modern high-speed unit. But because of the larger-diameter shaft and impellers on a slower-speed unit compared with those on a high-speed pump of similar output, the bearing surface and impeller tip speeds are similar – and therefore wear will be similar.



Submersible pumps that needed heavy-lifting equipment and days of work can now be installed and running within a morning.



Because of the larger-diameter shaft and impellers on a slower-speed unit compared with those on a high-speed pump of similar output, the bearing surface and impeller tip speeds are similar – and therefore wear will be similar.

Vertical turbine pumps

Vertical turbine pumps are more complex machines with a long drive shaft and many bearings. Traditionally these have been driven via a right-angle gear box and a diesel engine. As they age, and corrosion and wear take a toll, these units become unreliable. The process of removing and repairing or replacing them is complex and time consuming.

Advances in material and manufacturing technology have simplified some aspects of the turbine pump and have increased bearing life. Studies of line shaft lubrication have led to bearing designs that can run dry longer and resist the impacts of sand better than they have in the past.

Which pump is best?

Often it seems the best decision is to get a submersible in the hole and get the bore operating. This is often a sound decision to mitigate the potential for losses due to lack of irrigation water. But it is still important to consider the options for long-term reliability and operating costs.

The growth of renewable energy supplemented via diesel generators has made submersibles a clear choice. Or is it a clear choice? Does a vertical turbine have to be diesel driven? What if you compare an electric submersible with an electric turbine?



Vertical turbine pumps are more complex machines, with a long drive shaft and many bearings. Advances in material and manufacturing technology have simplified some aspects of the turbine pump and have increased bearing life.

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As manufacturers of both submersible and vertical turbine pumps, we have seen this shift of preference. We asked ourselves the question: which is the most efficient and economical option?

We compared the capital, operating and maintenance costs of a modern submersible pump and a modern electric turbine pump, both of which can use renewable energy (see Table 1). We have also compared a generator-driven submersible with an engine-driven turbine (and here we see significant savings using a direct-drive system, which we will discuss in a future article). The overall results might be surprising.

TABLE 1. EFFICIENCY, POWER AND COSTS OF AN ELECTRIC SUBMERSIBLE PUMP COMPARED WITH A VERTICAL TURBINE PUMP.

Variable	Electric submersible	Vertical turbine
Pump efficiency (%)	79	79
Motor efficiency (%)	86	96
Drive losses (%)	0	3
Shaft Power (kW)	91.5	94.24
Electrical input power (kW)	106	98
Annual running cost 3000 hr per year @ \$0.3 kWh	95,756	88,354
Five-year cost (\$)	478,779	441,773
Ten-year cost (\$)	957,558	883,546
Capital cost approx. (\$)	58,000	75,000
Installation costs (\$)	5,000	10,000
Capital cost plus installation cost less power saved	63,000	10,989
Ten-year savings (\$) achieved by installing a vertical turbine pump instead of a submersible pump		74,011

Submersible pump specs: stainless steel; 60 m 8" flexible rising main; 110 kW submersible motor; 100 L/s at 70 m. Vertical turbine pump specs: stainless steel; 60 m 8" column and shaft; 110 kW totally enclosed fan-cooled (TEFC) motor; 100 L/s at 70 m.

It is widely understood that the biggest cost associated with a pump is the energy used to drive it. Table 1 clearly demonstrates this to be true. For both submersible and vertical turbine pumps, running on peak power for just 3000 hours a year sees energy costs exceed capital costs by more than 1.5 times. Over 10 years, small improvements in efficiency of the pump and electric motor can almost negate the capital cost.

When investing heavily in power infrastructure, it makes sense to install pumping equipment that will need the fewest solar panels, generators or mains supply: the unit that will have the lowest environmental impact over time – which, as our calculations show, is the vertical turbine pump.

In submersible pumps, the motor will normally be the first component to fail. This may not be the fault of the motor; submersibles are more susceptible to incoming power issues and lighting than a surface-mounted TEFC motor.

Of course, if a turbine electric motor or diesel engine fails, the pump can stay in the ground, since all repairs can be done on the surface. And because the drivers are on the surface, a turbine will often provide a higher yield, particularly in tight bores, simply because the water enters the pump directly without having to pass and cool the submersible motor first. This allows for higher flows, which would be unachievable within the submersible motors' required cooling fluid velocities. This issue becomes less important in larger-diameter bores relative to the available pump frame sizes for the required pump duties.

Different pumps for different jobs

Get costs on both submersible and turbine options when equipping a bore, and consider capital cost, installation costs and running cost.

A submersible would be a clear best solution when:

- a bore is not straight and a turbine cannot be used
- the application needs an urgent water supply
- cranes and skills are not available to fit a turbine pump.

A vertical turbine is best suited when:

- the bore is narrow – a submersible pump needs a larger bore to allow for the submersible motor cooling water velocity to be within limits and power cable to fit past the pump
- no power or generator is available
- using an electric or hybrid installation targeting overall efficiency.

For some applications, vertical turbine pumps make sense, and for others, submersibles are better. The most important thing is to choose the right pump for the job.

Reference:

Test data U.C.P Australia
Pump test: Sterling 300GM-2 15/8/2019 (TS12440)
Submersible motor: 110kw 8" Sterling

Acknowledgment. Thanks to Sterling Pumps for this article.



NEW ELECTRICAL SAFETY STANDARDS AND MARKING REQUIREMENTS FOR SUBMERSIBLE PUMPS

New electrical safety requirements for the importing, manufacturing and sale of submersible pumps came into effect in December 2021. This means that the whole supply chain – suppliers, importers, resellers, distributors and installers – must check that ‘in scope’ submersible pumps are registered on the Electrical Equipment Safety Scheme (EESS) website and that the importer is a registered supplier with the electrical authorities.

These charges will apply to models of submersible pumps sold as ‘in-scope’ electrical equipment.

‘In-scope’ equipment covers electrical equipment found around the home or workshop but not items marketed exclusively to industry. This includes submersible pumps used in rainwater harvesting tanks that are used for domestic irrigation of turf and gardens.



These changes will apply to models of submersible pumps sold as ‘in scope’ electrical equipment, which includes submersible pumps used in rainwater harvesting tanks.

This new requirement applies specifically to submersible pumps sold online or over the counter to the general public.

The changes in the latest published version of Australian Electrical Safety Standard AS/NZS 4417.2 (2020) will make it mandatory for submersible pumps to have a Certificate of Conformity before they can be sold. These certificates must be issued by a recognised certifier under the Australian Electrical Equipment Safety Scheme (EESS). This certification ensures the pumps have been proven independently in a test laboratory to meet Australian Safety Standards.

Submersible pumps previously only required marking with the Regulatory Compliance Mark (RCM) to indicate the importer or manufacturer of the pump had evidence to show it was safe, and registered with EESS. But now, submersible pumps must also have been independently checked by a certifier and have a valid Certificate of Conformity to obtain an RCM. Retailers and wholesalers need to ensure they buy from a registered responsible supplier. You can check for the certificate or the registration of submersible pumps on the [EESS website](https://www.eess.gov.au).

Several recent electrical fatalities and injuries involving submersible pumps have triggered their reclassification of these items into the higher safety category of level 3 ‘in-scope’ electrical equipment. The increased regulatory requirements will mean retailers, suppliers, manufacturers, and importers of submersible pumps will need to look for the RCM and check the pump model’s registration on the EESS national register to ensure the new requirements are met to avoid breaching electrical safety laws of the States and Territories that apply the EESS, or risk possible fines and other enforcement actions.

It is often overlooked that both the power plug and the supply cord of the submersible pump already have a long-standing electrical safety requirement to be independently marked and referenced with their own certificate of conformity before the pump can be sold.

Information. Details of the requirements for the selling of ‘in-scope’ electrical equipment in Australia can be accessed at www.eess.gov.au.

Acknowledgment. This article was provided by the Queensland Electrical Safety Office.



WATER NIGHT 'WIN-WIN' FOR HOUSEHOLDERS AND SMART APPROVED WATERMARK LICENSEES

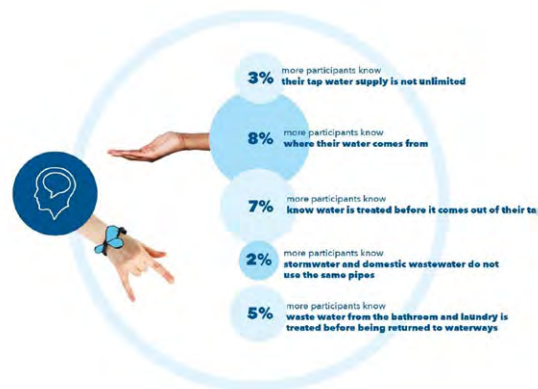
Water Night, held on 21 October 2021 during National Water Week, was a great success.

As part of this event, Smart Approved WaterMark offered licensees additional exposure for their certified products and services. Businesses like IPLEX and Lawn Solutions Australia, our first drought tolerant grass licensee, who signed up as sponsors, saw this as a great opportunity to be associated with this initiative.

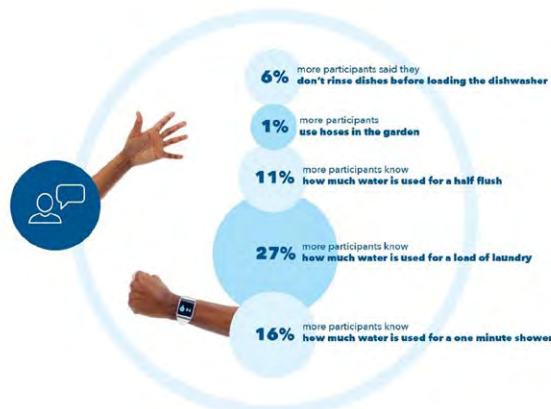
Social media success

Our social media campaign was a great success this year with a 400 percent increase (compared with last year) in our paid social reach. Our TikTok and Instagram promotion reached millions, while our traditional media campaign – based on our 'Billions of water-using minutes' research – earned television, radio and online coverage throughout October. Well-known personalities Costa Georgiadis and Olympic diver Sam Fricker also got involved, with Costa generating unique social media content on his Costa Cam series and Sam promoting a competition that engaged 87,000 or more people in total.

This promotion helped us to increase registrations, encourage participation and raise awareness of the event and the labelling scheme and the water efficient innovations that carry it. In being involved in Water Night our licensees not only gained valuable exposure for their businesses and their water-saving products, they also helped us to improve water knowledge across the nation.



WATER NIGHT encouraged Australia to be 'water mindful', self-aware when reaching for tap



Water efficient products play a key role in campaign

Ten licensees, including Irrigation Australia members Netafim and Hunter Industries, helped us to generate awareness of Water Night among their customers and the general public by donating more than \$8,000 worth of prizes that included irrigation and garden products, which all registrants had an opportunity to win just by signing up.

Join us

If you already have products certified with Smart Approved WaterMark you could take advantage of Water Night 2022 to increase awareness of your product and how it can help people save water.

Why not take this opportunity to become a sponsor or supporter of Water Night 2022?

If you have a product, which is not yet certified, that saves water or uses water more efficiently than any other product or process, there is still time to get it certified by Smart Approved Watermark before Water Night 2022. Apply for certification [here](#).

Contact chris.philpot@smartwatermark.info or call on 0422 289 599 to find out how you can benefit from supporting Water Night 2022.





WORKING TOGETHER TO REBUILD

The world watched on in horror at the apocalyptic images of people in Mallacoota in the East Gippsland region of Victoria being forced to the water's edge by fire the summer of 2019–2020. The recovery after the devastation of the bushfires in East Gippsland and the northeast of Victoria continues today.

One of the local businesses affected was Mallacoota Golf Club. The club house survived but the pump station, pump shed, and wiring were destroyed. The golf club has continued to operate, but until recently the owners have been unable to irrigate at all.

Working alongside the Mallacoota Golf Club to help rebuild, Rural & Turf Irrigation supplied a Lowara e-SV pump booster system, customised by Brown Brothers Engineers Australia with a 4VF drive unit, a Hydrovar controller unit on each pump, and a filter donated by Triangle Filtration.

"The previous system was really old" said Greg Sinclair from Rural Turf & Irrigation, "The new system has seen a major improvement for the Mallacoota Golf Club's irrigation, providing higher efficiencies with reduced watering time and significant pressure increases. The club could not be happier and have described their new system as fantastic."

The new irrigation control system is a Rain Bird IC system, which performs diagnostics for the pump shed equipment. Greg says that for this kind of job, technology has improved immensely in recent years, "This control system is much better than earlier systems for diagnostics and ease of use. The club's previous system was automated but was very limited compared with the new one".

Gary Horton from Triangle says that this was a good example of community and the irrigation industry coming together to help a local business, "Wally Menke, the principal of the company [Triangle] has strong family ties to the Mallacoota area, and donating the filter seemed a good way to help out".

At this stage, the greens of the 18-hole course are irrigated with water from a dam, supplemented by a reclaimed effluent system; the fairways are not irrigated.

The club is now looking to redesign the course and expand their irrigation system in the future, adding new sprinklers and pipework.

Acknowledgment. Thanks to Brown Brothers Engineers Australia for supplying material for this article.



Mallacoota Gold Club's new pump shed and pump station.

UPGRADE FOR MDB RIVER MODELS

In January 2022, the Australian Government announced funding of \$66 million to upgrade the Murray–Darling Basin’s 24 river models.

While the river models have worked well in the past, governments need to ensure these vital tools – which water managers rely on for their own decision making – are fit to support future decisions. This investment will improve these world-leading river models and increase collaboration and transparency across the Basin governments by ensuring water managers have timely access to the same modelling data.

Healthy river systems support industries, communities and the environment, prompting the need for continual improvements to water-use efficiency based on best-available data the upgraded modelling will provide. Managers run a range of scenarios across river data, highlighting how potential scenarios could impact the Basin such as drought, high rainfall events and bushfires.

Currently, the Basin’s 24 river models require significant manual intervention to provide a whole-of-Basin view. The funding investment will help improve river modelling in three ways:

- Integrating the independent river models more effectively by eliminating a lot of manual interventions, which will provide a more accurate picture of the Basin, e.g. as more is found out about the Barmah Choke sand sediment and how it moves, this can be included in the modelling faster.
- Improving how the 24 separate models ‘talk’ to each other. Being able to run scenarios across the whole Basin is important. The uplift will help streamline this process and enable faster exploration of scenarios.
- Investing in better ways to share water data and modelling information. Transparency in the models and how these are used in decision making is key to building trust.

The upgrade will also make the evidence, data and knowledge that is used to support decision making more transparent – this is in response to long-term feedback from water users and the community. The project will span four years, with all the existing MDBA and state government river models expected to be integrated by July 2024.

Source. [MDBA website](#) accessed 3 February 2022.

CRACKING DOWN ON WATER THEFT

Goulburn-Murray Water (GMW) and Lower Murray Water (LMW) are renewing their focus on the prevention, detection and enforcement of water theft.

Goulburn-Murray Water has been proactively monitoring customer account balances, educating customers on managing their entitlements, and increasing inspections to detect water theft – including checking customers whose usage exceeded entitlement in the previous irrigation season.

This has resulted in 25 successful water theft prosecutions in 2020/21, while the number of customers who took water without authorisation – and the amount of water taken from 2019/20 to 2020/21 – has halved.

Lower Murray Water has taken a similar approach by implementing clear compliance and enforcement measures as well as closely monitoring all accounts and alerting customers when their account balance is heading towards being negative. These compliance and enforcement measures together with the continuing education of customers have resulted in a significant reduction of unauthorised take with the volume reducing by more than 87 percent and the number of customers who took water without authorisation reducing by more than 65 percent in the past two years.

This focus will increase in 2022 as GMW and LMW introduced on-the-spot fines for water theft – this means that GMW and LMW can issue fines (known as Penalty Infringement Notes or PINs) without having to go to court. The PIN system will be in addition to being able to prosecute water theft in court.

More information on PINs and water use compliance can be found on the [GMW website](#) and [LMW website](#).

Source. [Goulburn-Murray Water website](#), accessed 12 February 2022.

MAREEBA-DIMBULAH EFFICIENCY IMPROVEMENT PROJECT

The \$32.54 million Mareeba-Dimbulah Efficiency Improvement Project, which will enhance water delivery to more than 17,000 ha of Far North Queensland farmland, has been completed.

The infrastructure upgrades will reduce losses and improve service reliability to growers in the Atherton Tablelands, where the main crops are sugar cane, bananas, mangoes, avocados, coffee, tea trees and vegetables.

The work includes replacement of 14 km of pipeline, installation of 125 automated control gates in irrigation channels, and upgrading of 157 water offtakes. The project will save up to 8,306 ML of high-value water and generate around \$20 million per year in increased agricultural production.

The project, undertaken by Sunwater, was jointly funded – with the Australian Government contributing \$11.6 million through the National Water Grid Fund and the Queensland Government contributing \$20.94 million.

With construction now complete, the process to validate water savings is underway. Once the savings are confirmed, new water allocations will be made available for sale.

Source. [Queensland Government website](#) accessed 12 February 2022.

TASMANIAN IRRIGATION – TRANCHE 3 UNDERWAY

Tasmanian Irrigation is set to double its capacity to deliver high-surety irrigation water to Tasmanian farmers as part of the Tranche Three program of works. This article describes the first five (of ten) projects, which will deliver an additional 133,000 ML of irrigation water to farmers.

The Tasmanian Government has already committed \$108.7 million and the Australian Government \$104.7 million to Tranche Three, which will be combined with a substantial contribution from landowners, to design, construct and manage the new irrigation schemes.

These first five projects are:

- Don Irrigation Scheme (North West)
- Sassafras Wesley Vale Irrigation Scheme Augmentation (North West)
- Northern Midlands Irrigation Scheme (Central)
- Tamar Irrigation Scheme (North) and
- South East Interim Solution and South East Integration Project (South).

A further five projects are already in the planning stages. Tasmanian Irrigation Chief Executive Office Andrew Kneebone said unprecedented demand had been recorded across the new projects as farmers realised the benefits of reliable and cost-effective irrigation water.

“Northern Midlands is a perfect example of how demand has reached record levels,” Mr Kneebone said. “We received Expressions of Interest totalling 13,000 ML in May 2019, but by the time water sales concluded in early 2021, the decision was made to build a 25,500 ML scheme due to the level of offers from local landholders to purchase water.

“By 2050, Tasmanian Irrigation will manage a portfolio of irrigation infrastructure valued at more than \$680 million, capable of delivering 168,998 ML of water via 1,451 km of pipeline, 55 pump stations, 24 dams and three power stations.”

Information. For more information visit the [Tasmanian Irrigation website](#), email enquiries@tasirrigation.com.au or call (03) 6398 8433.

Work is underway on the South East Interconnect.





THREE SIMPLE TIPS TO HELP YOU MASTER YOUR SMALL BUSINESS FINANCES IN 2022

SNAPSHOT

- Small businesses rarely have a big team of support staff to help manage and analyse the business so it's important that managers and owners focus on the things that count when organising the financial side of things
- In this article, accountant and advisor Richard Francis identifies the three key elements that any business owner or manager should understand to run a profitable enterprise.
- Scenario planning is also a good practice to help manage future challenges and opportunities

Unlike large organisations, small businesses are rarely backed by a robust team of finance, HR, design, or marketing experts. Because of this, small business owners can often end up wearing many of these hats and learning skills initially outside their comfort zone. This can be daunting—especially when it comes to the financial side of things, writes Richard Francis, Founder and CEO of Spotlight Reporting.

Despite there now being a range of cloud accounting tools that ease the way for owners to take control of their finances, there are still a few stumbling blocks along the way. If you're not feeling confident about your finances and aren't sure where to begin, try these tips.

Measure the financial metrics that matter

Business owners can get bogged down with numbers that, at the end of the day, don't support the goals they've set themselves. Start by outlining the financial (or non-financial) goals you're aiming to achieve. These goals could include growing the business, saving to send your child to university, or supporting your current lifestyle while only working four days a week.

Whatever you're after, write it down. Then, focus on improving the numbers that will get you where you want to go. If you're not sure what these numbers are, it's time to consult an accountant or a trusted advisor—be sure to tell them where you're headed, so they can help you chart an accurate map.

Focus on cash flow

Cash flow is the number one issue affecting small to medium businesses right across Australia. According to The Invoice Market's research, there's \$76 billion worth of outstanding invoices and two million businesses drowning in a sea of unpaid bills. Because of this, you shouldn't rely on a healthy profit margin as your be-all and end-all. You need to consider the timing of money coming in, and money going out.

Cash flow is the lifeline of your business and needs to be a key area of focus. Without liquidity, your business might not survive.

Prepare for the future by forecasting your finances

When you're looking to make big financial decisions for your business, the best thing you can do to prepare yourself is creating a financial forecast. Now you can use custom-built





financial software to look into the future of your business, based on either a budget or actuals.

But I recommend taking things a step further by drafting out three different scenarios—what I like to call ‘the good, the bad, and the ugly’—to outline what could happen if everything does or doesn’t go according to plan. It’s no use only planning for one contingency; you need to be prepared to weather all three.

Being on top of your finances may seem daunting at first, but it’s crucial for the survival of your business. Ensure you’re setting the right goals, keeping on top of cash flow, and preparing for any possible future scenarios. When in doubt, engage the services of a trusted advisor who will be able to help you chart a way forward. In these troubling times especially, it’s an investment that might mean the difference between sinking, surviving, or thriving.

Acknowledgment. This article is reprinted with permission from Flying Solo, [website](#)

Richard Francis is an accountant and advisor of over 20 years, and the founder and CEO of accounting software company Spotlight Reporting. He has worked with many businesses to achieve and their goals.

ARE YOU THE DIRECTOR OF A COMPANY?

Director IDs are being implemented as part of the Commonwealth Business Registry Service to verify and track an individual director’s corporate history.

Essentially, the government is looking to stop illegal phoenix activity – a company director transferring assets to new companies in order to continue operating a business and leaving the previous company in debt.

Applications for director ID numbers are now open.

If you are an existing director who was appointed on or before 31 October 2021, you will be required to apply for a Director ID before 30 November 2022.

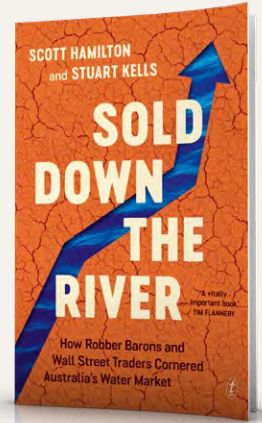
If you are a new director, appointed between 1 November 2021 and 4 April 2022, you have 28 days to apply for a Director ID. If you are a new director, appointed from 5 April 2022, you will need to apply for a Director ID before a company is registered

What You Need to Do. Existing company directors are encouraged to set up their myGovID now and apply for their Director ID ahead of the relevant deadline.

Director IDs are applied for through myGovID. Detailed instructions and an application can be completed at the [Australian Business Registry Service website](#).

SOLD DOWN THE RIVER: HOW ROBBER BARONS AND WALL STREET TRADERS CORNERED AUSTRALIA’S WATER MARKET

Unlike many critiques of the Murray–Darling Basin Plan, who target irrigators, defend water markets and push for more buybacks, the authors of *Sold Down the River* focus on the water traders. The book describes the evolution of the water markets since the adoption of the Basin Plan and outlines how the Plan has failed irrigators, communities, Indigenous people and the environment, while traders, corporate investors and bankers – many of whom are based overseas – have prospered.



The Murray–Darling Basin is Australia’s greatest environmental asset. The story of water in Australia is written into its ancient rivers, creeks and wetlands. It’s home to more than forty Indigenous nations, and it covers an area bigger than France. It is the beating heart of our regions and sustains 40 percent of our food production.

In 2012 Australia signed up to the Murray–Darling Basin Plan, a scheme designed to create a market for the Basin’s water and to safeguard the environment.

But, the authors say, the Plan has gone horribly wrong. It has sold our farmers and rural communities down the river. It has contributed to appalling environmental damage on the planet’s driest inhabited continent. It has allowed a ruthless market to form, exploited by traders who buy and sell water as if it were a currency like Bitcoin.

Authors Scott Hamilton and Stuart Kells, both experts in public policy, visited Australia’s food bowl and interviewed irrigators, farmers, Traditional Custodians and water traders to tell the story of the many factors that corrupt the water market. In doing so, they bring to light how we have failed to protect our most precious natural resource.

Sold Down the River has two key messages: first, the trading system is too big, too fast and too complicated, and this creates an unlevel playing field. When it comes to water trading, most growers do not have the time, knowledge or technology to compete with bots and traders on supercomputers.

Second, the disconnection of the water from the land for trading purposes has caused many problems; the authors argue that people need to have a connection to the water in use.

To fix the problems, the authors say the market needs to be slowed down and trading should be kept in the valley where the water is.

NEW PRODUCTS

TORO

TORO'S AQUA-TRAXX AZUL DRIP TAPE IMPROVES CROP UNIFORMITY

Toro Australia has introduced a new drip tape, Aqua-Traxx Azul, which features an innovative flow path design in the emitter and is designed to resist clogging.

Market demands, weather patterns and resource availability change every day. In response, precision agriculture practices are evolving too, helping growers to stay ahead by increasing yield, improving quality and making the best use of available resources.

Aqua-Traxx Azul, Toro's latest innovation in precision agriculture, offers better clog resistance through an innovative emitter design. It gives growers more control over the time, energy and water they invest in their crop.

The key to reducing drip tape clogging is to protect the flow path labyrinth from debris. Azul drip tape has a greater filtration area, with patent-pending multi-stage filters that protect the emitter from different sizes of debris. This means the tape has only a 120 mesh filtration requirement. Optimised large flow passages in the emitters ensure a consistent and uniform distribution of water and nutrients to maximise clog-resistance and performance.

One of the first people in Australia to use Toro's Aqua-Traxx Azul drop tape is Bruno Capogreco, from Capogreco Farms in WA. Capogreco Farms have been using Toro Aqua-Traxx drip tape for more than a decade and have installed more than 5,000 reels over that time. The 200 ha family farm, which is located in Hamel, an hour south of Perth, produces rockmelon, honeydew, watermelon and orange candy for the Australian market and export.

Bruno says that maintenance and flushing of the dripline is very easy: "We use flushing valves at every end and flush once per month. Uniformity of Azul is a lot better and we have seen a 5 percent improvement in yield".

The new Aqua-Traxx Azul is available in 0.49 and 1.02 Lph emitter flow rates.

Information. To find out more about Aqua-Traxx Azul go to: www.toroirrigationsolutions.com.au.



IN THE NEXT ISSUE

The **Winter 2022** issue of *Irrigation Australia Journal* will feature:

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- > Digital, AI and remote technology applications in irrigation
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JOURNAL

FOR IRRIGATION PROFESSIONALS



FILTERSAFE EVERCLEAR FILTRATION

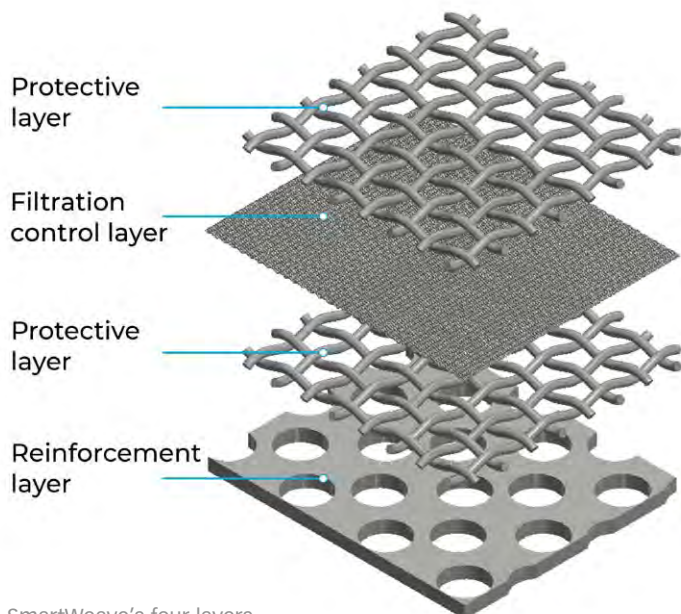
Filtration is a key component of any irrigation system whether it be for removing sediment and other debris to stop clogging, or for cleaning the water as much as possible before it goes on to a secondary treatment to prevent the spread of infectious parasites and diseases. The filter is the first line of defence for the entire irrigation system.

Filtersafe originally made waves in the seawater filtration industry with their NozzleX cleaning nozzles, SmartWeave sintered four-layer screen, and EVERCLEAR automatic screen cleaning process. It then saw that the technology was suited to irrigation filtration and introduced it to the market.

EVERCLEAR features

EVERCLEAR, whose automated filter cleaning sequence is based on the other patented technologies found in SmartWeave screens and NozzleX nozzles, removes high rates of organic matter and inorganic matter.

The Smartweave screen is made up of three stainless steel weave-wire screens and a fourth reinforcement layer to enhance the screen's integrity. These screens are sintered together to create one mega-screen that is durable enough to filter without additional support. The sintering also reduces the distance between the screen layers, creating a slim screen, only 0.55 mm thick. Standard screens tend to be at least 2.5 mm thick, which reduces the suction cleaning power of the nozzles, increasing slippage flows and in general diminishing nozzle cleaning efficiency.



SmartWeave's four layers.

These screens are available in a variety of sizes, from 500 microns down to 10.

Filtersafe filters have a proven track record of removing sediments without clogging. Independent tests have shown that even in extreme conditions when TSS levels were extremely high, they continued to operate when others failed. They can also effectively filter microscopic organisms. According to tests, the Smartweave screen removes 99.95 percent of zooplankton from ballast water.

The NozzleX suction scanner enables the cleaning of organic and inorganic material from the filter's screen without wearing down the nozzle or wearing out the screen.



NozzleX nozzle head on SmartWeave screen.

Unlike a typical automatic screen filter, NozzleX uses low head pressure (as low as 23 psi), to clear off all build-up on the screen without damaging it. The risers move the nozzles so that 100 percent of the screen is scanned and cleaned. Next, in contrast to other filters, NozzleX nozzles contact the screen using gentle pressure to remove materials from the screen without impacting the screen's integrity. This results in improved performance and a longer lifespan for your filter.

Information. To find out more, visit the [Filtersafe website](#).



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