

# HYDROFLUX

WATER | SCIENCE | TECHNOLOGY

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NEWS FOR CUSTOMERS AND FRIENDS OF THE HYDROFLUX GROUP

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## Climate Change and Impact on Australian Businesses

BY SORRELL HANDFORTH

Climate change is a term which is thrown about often, but do we really know what it means?

When the energy from the sun enters the atmosphere, some of it stays trapped under a layer of greenhouse gases and some is reflected back into space. This greenhouse effect has been to our benefit as it has kept the temperatures here on Earth within tolerable boundaries enabling life on Earth to flourish.

But here is the problem. We are increasingly influencing the climate and the earth's temperature by generating enormous amounts of greenhouse gases, principally CO<sub>2</sub>, methane, nitrous oxide and CFC's through burning fossil fuels, cutting down rainforests and farming livestock. These greenhouse



gas emissions absorb and trap more heat in the atmosphere and over time, produce a positive climate forcing effect or warming. This warming increases the temperature of the Earth's surface and oceans impacting the global climate. That is global warming, creating climate change and now the climate crisis. As a

result, Australia's weather is becoming hotter, dryer and less predictable.

We are facing increased temperatures, more frequent and longer heatwaves, drought, rising sea levels, coastal erosion and severe weather events including flash flooding, catastrophic bushfires and

increased cyclone activity intensity. Following current trends, this will continue to worsen into the future unless action is taken.

Changes in weather patterns can have knock on effects which can significantly impact your business including workplace health and safety, supply

chain disruption and raw material supply risk.

There is no one-size-fits-all approach to climate change. If you need assistance to assess and manage climate risks that effect your business, Cress Consulting has the expertise to help you ensure a more sustainable, secure future.



## PONDUS – Digester Feed Sludge Hydrolysis Simplified

FEATURED STORY

BY JOHN KOUMOUKELIS

Around the world many Water Authorities are looking into biosolids strategies that minimise disposal costs, provide biogas for renewable energy use and alleviate public concern of the agricultural use of untreated biosolids.

In the last two decades the drive to maximise existing digester capacity has led to several pre-treatment processes based on sludge disintegration being deployed in Europe, UK, USA and Australia/New Zealand.

“Our partnership with CNP Cycles from Germany provides

us with access to cutting edge and well proven biosolids technology, such as AirPrex® Struvite Removal and PONDUS™ Thermal Chemical Hydrolysis (TCHP).

PONDUS has been installed in 11 sites around the world – it's an interesting process as it combines an alkaline process step with the use of low-grade recovered heat, but with the massive benefit of lower operating temperatures as compared to the pure thermal hydrolysis.

Instead of operating at 140 or 150 deg C, PONDUS operates at 70 – 80 deg C resulting in a

greatly simplified hydrolysis process, yet still providing the benefit of higher sludge dewaterability, increased biogas production, increased digester capacity and reduced sludge viscosity.

The low temperature and pressure also do away with breakdown of various complex proteins that would otherwise colour and load the digester supernatant.

With 11 references operating on plants sized from 65,000 through to 1,500,000EP, PONDUS is a good fit for many sewage plant treatment plants across Australia and New

Zealand that are looking to secure higher renewable energy yields from existing or new assets” says John Koumoukelis, CEO of Hydroflux EPCO.

CNP Cycles is a German based company that provides advanced biosolids technology to recover nutrients and increase biogas production from anaerobic digesters. The company has delivered several groundbreaking projects within the biosolids space in Germany, Netherlands, Middle East and China.

If you would like more information on the PONDUS system please email [info@hydrofluxepco.com.au](mailto:info@hydrofluxepco.com.au)

FROM THE CEO



If the current COVID pandemic has taught us all anything it is that the world we live in is a lot more fragile than it seems. Climate change and reduction of greenhouse gas emissions is justifiably now prominent on the agenda of governments and businesses alike and the sense of urgency to do something about it is slowly but surely rising.

The recent Leaders' Summit on Climate saw the US return to the table with a pledge to halve greenhouse emissions by 2030 and the European Parliament is backing a law mandating a 55% cut by 2030 for the European Union clearly indicating the governments worldwide are joining the battle.

The Hydroflux Group is busy advancing its own sustainability strategy, recently committing to our modern slavery statement, and aligning our sustainability goals and targets with the objective of achieving Climate Active certification early next year. We are also busy working on systems to allow us to provide more accurate options advice to our clients so that they can make better decisions based around on the long term sustainability of the water, wastewater and sludge treatment equipment and facilities we provide whilst at the same time we are working to provide more sustainable solutions.

Hydroflux's foremost goal is to protect our most valuable resources by helping our clients improve sustainability. At the same time recognising that climate change will happen and we need to assist our clients, most of whom are in essential industries or utilities, build resilience to this change.

- ADRIAN MINSHULL

## Practical Solutions to Address the Water Crisis

BY JULIA SEDDON

As the demand for food grows and our world continues to change, the food and beverage sector is looking for ways to be more efficient and more resilient.

Australia is the driest continent on earth. The changing climate is leading to further drying, less reliable rainfall, more frequent drought as well as more intense and damaging rainfall events. In a time of water crisis what are the practical solutions?

Food and beverage production is reliant on the availability of large volumes of high-quality water and appropriate treatment and disposal systems, all of which can be

location specific and impacted by climate change.

Undertaking a sustainable water risk analysis will help identify solutions. It will give a good indication of how sustainable an operation currently is and what actions could be taken to improve water security, reduce costs and increase efficiency. Measures could include water reduction or efficiency programs, water treatment improvements and water reuse technologies.

Efficiency measures only go so far and because water quality is so important to food and beverage businesses advanced reuse technologies such as Advanced Water Treatment could be explored.



With the application of advanced water treatment plants (AWTP), Australian food businesses have the potential to:

- Reuse up to 90% of water, significantly reducing water use
- Produce high quality potable water for use in food processing
- Demonstrate responsible use and management of water

- Continue to operate 'as normal' during periods of water restrictions
- Decouple growth from water availability thereby increasing resilience

Cress understands how water risk can impact business operations, supply chains and social licence to operate. We can help you undertake a sustainable water risk analysis and identify practical solutions to improve the resilience of your operation or business.

## Hydroflux EpcO Supports Sustainable Health Care in PNG

BY PAUL COBBIN

Sustainability is rarely an easy road to travel and Hydroflux EpcO's latest sewage treatment project, in Papua New Guinea (PNG), is a textbook case of determination and persistence to bring sustainable health care to the country's second most rugged province.

At the Wabag hospital site in the PNG rainforests of Enga, sustainable health care is about bringing medical treatment within range of the population, offering services and facilities that meet a broad range of patient needs whilst treating resultant hospital wastewater to a standard that will protect villagers and the environment downstream of the intensive medical facility.

Paul Cobbin, Hydroflux EpcO's General Manager of Solutions, has been working with various stakeholders including the Enga Provincial Government Engineer since 2013 to assist with the development of the Wabag hospital project.

"Many of us take health care for granted. Why wouldn't you when there is a clinic in every local shopping centre, but before the Wabag facility, Engan patients had to drive up to five hours to the neighboring province for treatment" Mr Cobbin says, comparing

Australian health care with the Engan experience.

At an altitude of 2000 meters, in a province with an area of 11,704km<sup>2</sup>, the Wabag hospital is the only hospital at the end of the 700-kilometer highlands highway in a region susceptible to earthquakes and landslides. Self-sustainability is critical when the only supply route gets cut regularly for days and sometimes weeks.

To be self-sustainable, the campus built by GDFC PNG Ltd has operating theatres, day patient clinics, wards for extended stays, commercial kitchen facilities and laundry plus a mortuary and staff accommodation in villas within the security of the vast mountainside site. As well as

hospital facilities the site has its own natural water source, a Hydroflux sewage treatment plant (STP) for processing of sewage and a solid waste processing facility.

The live-in hospital campus generates significant sewage waste and without effective treatment a hospital site such as Wabag could not exist.

The Hydroflux EpcO solution was designed as a complete turnkey solution to reduce environmental impact and be scalable to allow for growth in the hospital capacity as future development of the site continues. From a technical perspective, the Hydroflux EpcO solution included screening to remove non-treatable matter, biological treatment using a Moving Bed Bioreactor, tertiary treatment for improved effluent quality as well as sludge handling to

dewater the sludge on campus for further composting and reforestation of local jungle.

"Getting to the starting line of the Wabag project has been an exciting journey with many stakeholder meetings along the way but sustainable infrastructure takes time to develop and Hydroflux continues with determination to be part of the solution in a world constantly under pressure" says Mr Cobbin.

Creating sustainable health care means building a facility that meets the needs of the region without compromising the environment or the future of villagers living nearby. The Wabag hospital meets the challenge by bringing medical care closer to the population and using the Hydroflux EpcO sewage treatment solution to reduce impact of the facility on the local environment.





## “Changing the image of sewage treatment”



### Environmental Protection Amendment Act 2018 in Victoria

BY ELIZABETH KOLOS

With penalties of up to \$644,000 and/or 5 years imprisonment for an individual, or \$3.2 million for a corporation, the Environmental Protection Amendment Act 2018 is transforming environmental protection laws in Victoria by increasing criminal sanctions and penalties to polluters.

Until recently the principal legislation was the Environment Protection Act 1970. In 2017 the Victorian Parliament passed the Environment Protection Act 2017. The Environment Protection Amendment Act 2018 amends the 2017 Act so that the 2017 Act will become the principal environmental legislation in Victoria and the 1970 Act will be repealed.

Although the Victorian Government intended this new legislation would take effect from 1 July 2020, due to COVID-19, it will now take effect from 1 July 2021.

Two main amendments are:

- **General Environment Duty (GED)**
- **Permissions**

#### General Environmental Duty (GED)

This requires Victorian businesses, industry and the community to undertake reasonable steps to eliminate or reduce risks of harm to human health and the environment from pollution and waste.

Unlike similar laws around the country, a GED breach could lead to criminal or civil penalties. All Victorian citizens will have a legal obligation to take reasonable steps to eliminate or minimise risk to others or the environment. The model for GED is similar to that of Victoria's Occupational Health and Safety Laws.

Breaching a GED will attract a penalty of up to \$322,000 for an individual or \$1.6 million for a corporation. For an intentional or reckless breach of a GED that results in material harm, a higher penalty of up to \$644,000 and/or 5 years imprisonment for an individual, or \$3.2 million for a corporation will apply. These fines are greatly increased where currently the maximum environmental



infringement notice is for a company to be fined 50 units (\$8261).

#### Permissions

Permissions are now the only forms of statutory authorisation and includes: Development Licences, Operating Licences, Pilot Project Licences, Permits or Registrations.

Works Approvals and Licences are no longer issued. Works Approvals are broadly replaced by Development Licences and Licences are broadly replaced by Operating Licences. Pilot Project Licences are a new Permission for a research development or demonstration activity.

Registrations are another new Permission that would be automatically granted to organisations posing significant risks but where simpler controls exist which

can be standardised across a sector.

Permissions work alongside the GED and there are three tiers of permissions based on the level of risk to human health and the environment:

1. **Licences ► high risk**
2. **Permits ► medium risk**
3. **Registrations ► low risk**

#### What does this mean for your business?

Company directors will now have direct liability to ensure their businesses reduce the risk of their activities potentially harming the environment or human health from pollution or waste. This is in much the same way that they already need to for Occupational Health and Safety Laws. Businesses will need be proactive to continually reduce risks to the environment, keep records

and report certain pollution incidents to the EPA as soon as practicable.

Businesses also have a duty to manage contamination risks for land their business uses. Under the legislation they are known as 'duty holders'. Duty holders need to assess the likelihood of contamination being present, and if there is contamination, to manage its risks. This is even if the contamination was not caused by your business.

In addition to reporting incidents to EPA directly, the community and third parties will now be able to have civil remedies to apply to the court directly if it's their view that your business is not meeting GED. Third parties are community members, environmental interest organisations or other interested parties.



## Cleaning of Polymer Spills Has Never Been Easier

BY BRUCE WILLIS

**Oil based emulsion polymers are typically used in water and wastewater treatment and sludge dewatering.**

Cleaning up after an oil-based emulsion polymer spill is notoriously difficult, time consuming, potentially hazardous and requires an enormous amount of water.

Hydroflux Utilities has developed a specialised, fast-acting, water-based cleaner

which not only reduces time and effort to deal with a polymer spill, it also reduces significantly the amount of water required for clean-up, and thus enables the spill to be easily contained to the local area.

HydraClean™ HC-3100 is safe to use on most floor and workplace surfaces including concrete, plastic, Perspex, rubber, glass and metal. This non-hazardous formula is effective against all oil-based

emulsion polymers, regardless of molecular weight or charge.

HydraClean™ HC-3100 is ready to use straight from the container and is can be applied using a garden-type trigger handle sprayer or similar device. When sprayed liberally over the entire spill area and allowed to stand for 3-4 minutes, HydraClean™ HC-3100 will create a mixture that can be simply wiped down with paper towelling.

To learn more about HydraClean™ HC-3100 or any other speciality products, contact Hydroflux Utilities today.



## Tunnel Infrastructure WTP - Perspective from the Project Manager

BY RYAN DAVIS

Another Hydroflux Tunnel infrastructure Water Treatment Plant (WTP) in Sydney has been commissioned & handed over.

Hydroflux Industrial's Project Manager Ryan Davis worked closely on this project:

"The effluent water treatment plant is complete, and everyone is really happy with the results. I'd like to thank everyone that was involved

in building this high-quality infrastructure project"

Tunnelling infrastructure is necessary for many Australian cities to meet their future transport needs. During construction, water accumulates within the tunnel from groundwater sources interrupted by the excavations and from the processes of tunnelling itself.

Tunnel effluent primarily consists of groundwater,

heavy metals, particularly Iron which can cause discoloration in the receiving water if it is not removed. Other than the Iron, ground water can also contain high quantities of natural impurities and in some instances man-made pollutants that are a legacy from past industrial activities at the surface.

This new Sydney infrastructure WTP was designed to treat tunnel effluent which consists of groundwater, wash water and run-off collected in the tunnel drainage system.

Tunnel effluent is pumped to the WTP and then treated to the quality required by the Environment Protection Authority before being released into a local waterbody.

### The Treatment Process consists of:

- Inlet water quality monitoring
- Screening
- Balancing & Aeration
- Chemical Pre-Conditioning (pH correction & coagulation)
- Solids removal via Dissolved Air Flotation using a Hydroflux HyDAF
- Advanced Multimedia Filtration
- Outlet water quality monitoring

The residuals produced are dewatered to a dry & spadable cake via a HUBER QPRESS.

After the raw tunnel effluent has been aerated in the balance tank the iron precipitates, discolouring the water brown. After further chemical pre-conditioning (pH correction and coagulation) and solids removal via Dissolved Air Flotation (DAF) the effluent has much of the brown colour removed. After dissolved metal precipitation and advanced multimedia filtration the water quality is suitable for discharge to the adjoining waterway.

*"This is another example of critical infrastructure provided by Hydroflux to help support communities and drive growth around Australia." - Ryan Davis*



Photo showing (left) raw effluent, (middle) post primary treatment - DAF and (right) post -tertiary treatment - multi-media filtration - AMMF



## Multiple STP Inlet Screens Awarded to Hydroflux Epco NZ

BY JOHN KOUMOUKELIS

Hydroflux Epco NZ has recently delivered several STP Inlet Screens for treatment plants located in the North Island.

Screening of raw sewage removes gross solids, plastics, bags and other material that would otherwise clog the treatment plant process. Process equipment such

as aerators, sludge pumps and mixers can be costly to maintain without an automatic fine screen at the inlet.

HUBER Spiral Screens were selected for the various STPs due to their proven track record in New Zealand, local backup and the fact that the unit is fully fabricated from stainless steel.

"Our screens from HUBER

have been proven to be reliable with the lowest life cycle cost. Due to the heavy-duty construction the HUBER Ro9 Spiral Screen is ideal for New Zealand as it requires very little maintenance, operates automatically and includes an integrated compaction zone which does away with the need for separate machines to handle the screenings.

The internals are fully fabricated from stainless steel - even the internal screw auger. We do this as standard to maximise life cycle value" says Orod Roostae, General Manager of Hydroflux NZ.

The Ro9 Spiral Screen is suitable for flows under 150 L/s and is available in apertures from 1 to 6mm. The screenings removed are washed and compacted via an integrated system within the machine. The units can be installed into concrete channels or stainless steel tanks.

HYDROFLUX QUIZ - DIFFICULTY: EASY

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## HYDROFLUX

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The Hydroflux Group comprises eleven companies based in Australia, Fiji, New Zealand and the United Kingdom, providing design-and-build, equipment, process and operational services in water and wastewater treatment.

The group's skill and experience span across municipal and industrial water and wastewater treatment with full after sales support.

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