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**clean
ocean**

foundation

22

NATIONAL
CLEAN OCEAN CLEAN WATER POLICY

CLEAN OCEAN ORG

CLEAN OCEAN. CLEAN WATER.

Help stop bad decisions on water supply that will pollute our oceans.

**It's only
wastewater
if you
waste it!**

STOP OCEAN POLLUTION

Every day we all pollute our ocean. Around the coast of Victoria, we dump more than two MCG full of water contaminated with pollutants into our ocean every day. Each year Australia wide, there is enough polluted wastewater dumped into Australia's oceans to fill Sydney Harbour more than two and half times. This cocktail of toxic waste contains carcinogens, pharmaceuticals, algae producing chemicals, microfibre plastics and other hazardous pollutants.

NO MORE DESALINATION

Meanwhile, the impact of climate change and growing populations on water supply have the same players up to their old tricks, calling for construction of more ocean polluting, expensive, energy guzzling, desalination plants on a coast-line near you.

There is even a push use desalination as justification for building nuclear power on our Australian coastline.

More desalination plants mean more ocean pollution. When the option to recycle water is rejected, every 1 litre of desalinated water is responsible for 2 litres of ocean or river pollution.

But there is a way to secure our water future and reduce the ocean pollution...

RECYCLE WATER

Water Recycling Nodes

It's only wastewater if you waste it! Simply put, we can modernise all our waste water treatment plants, that currently pollute our oceans and rivers, into clean water recycling nodes. These will safely and economically produce purified recycled water for our use.

Complex decisions need an effective and real democratic process

We will need to convince our politicians and other decision makers that it's time Australia had a proper conversation about water supply options involving a trusted democratic process. We must challenge the misconception that the only solution to water shortages is to build more environmentally damaging and expensive desalination plants on Australia's precious coastlines.

When the option to recycle water is rejected, every 1 litre of desalinated water is responsible for 2 litres of ocean or river pollution.

**LET'S SHOW
ALL AUSTRALIA
THERE'S A
BETTER WAY!**
.....
**JOIN OUR CLEAN OCEAN
CLEAN WATER CAMPAIGN
TO ACHIEVE A SAFE AND
CLEAN FUTURE FOR
AUSTRALIA'S WATER
SUPPLY AND OCEAN.**

A COCKTAIL OF POLLUTANTS

Risk of outfalls: Pollutants and health



MICROPLASTIC FIBRES

Microfibres from clothing end up in our waterways and oceans, where they wreak havoc on marine animals and environment.



FOREVER CHEMICALS (PFAS/PFOS)

Used in waterproofing, stain resistant sprays and flame retardants. These are known to affect fertility and other hormone functions at extremely low levels in all mammals.



GERMS (PATHOGENS)

Microscopic organisms including bacteria, viruses, protozoa and fungi that can have catastrophic effects on human and marine animals.



HEAVY METALS

Accumulate in fish and other marine animals. Worldwide, it is so bad that we should not eat some fish at all, including shark, tuna and orange roughy.



COSMETIC SUNSCREEN PRODUCTS

Up to 10% of the world's reef systems are at risk of elimination by the chemicals found in sunscreen products. One drop (1gm) of sunscreen in six-and-a-half Olympic sized swimming pools of seawater is toxic to coral.

DID YOU KNOW?

TWO SURFERS ALMOST DIED AFTER SURFING NEAR AN OUTFALL AT PORT FAIRY ON GOOD FRIDAY 2021. BOTH WERE HOSPITALISED AND RECEIVED MASSIVE DOSES OF ANTIBIOTICS FOR A "MYSTERY" INFECTION.



OUTFALLS: OBSOLETE & RISKY

MARINE LIFE

Short interval peak loads of pollution containing high levels of pathogens.

Old or overloaded Coastal Outfalls during times of high tourist numbers.

Outfalls with equipment failures or overloads.

RECREATIONAL USERS

Legal "mixing" dead zones near outfall discharge points.

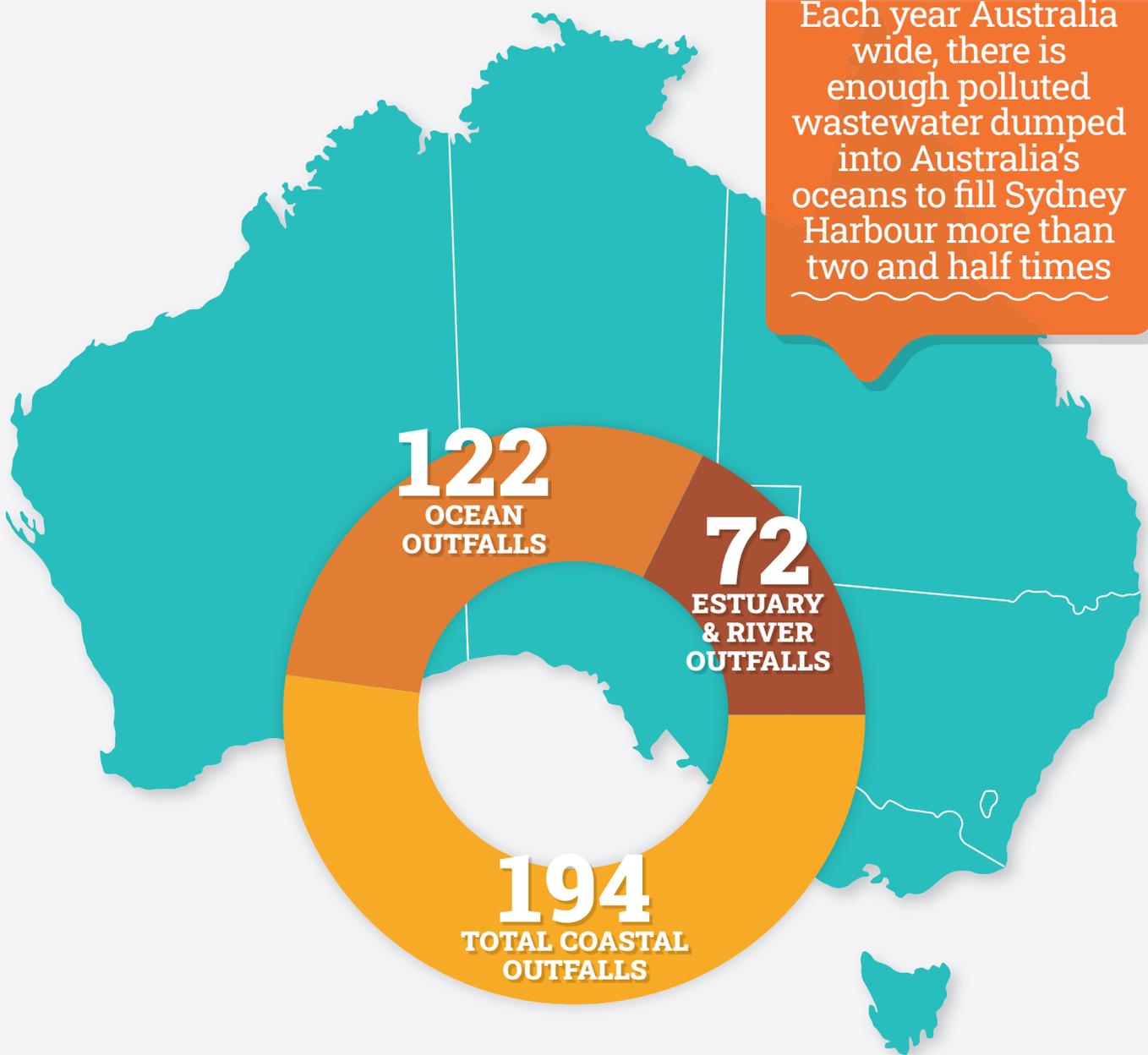
Bioaccumulation from pollutants – both local and distant from dead zones.

EVERY DAY WE POLLUTE OUR OCEANS

Every day around Australia we still dump a toxic cocktail of pollutants from partially treated sewage and industry waste into our oceans, estuaries and rivers. We are killing our oceans and risking our health.

AUSTRALIA'S OCEAN OUTFALLS

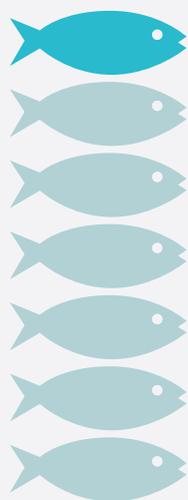
Each year Australia wide, there is enough polluted wastewater dumped into Australia's oceans to fill Sydney Harbour more than two and half times



■ TOTAL COASTAL OUTFALLS ■ OCEAN OUTFALLS ■ ESTUARY & RIVER OUTFALLS

NEGATIVE EFFECT OF OUTFALL POLLUTION

Help stop bad decisions on water supply that will pollute our oceans.

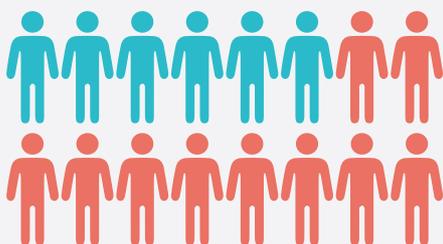


1 FISH MEAL PER WEEK

THE MAXIMUM USA AUTHORITIES RECOMMEND DUE TO THE RISK OF HEAVY METAL POISONING

7300 KG

THE AMOUNT OF SUNSCREEN DUMPED INTO AUSTRALIA'S OCEANS EACH YEAR THREATENING CORAL REEFS



60% REDUCTION

IN FERTILITY SINCE 1973 RELATED TO FOREVER CHEMICALS WHICH ARE KNOWN TO BE IN ALL OUTFALL DISCHARGES

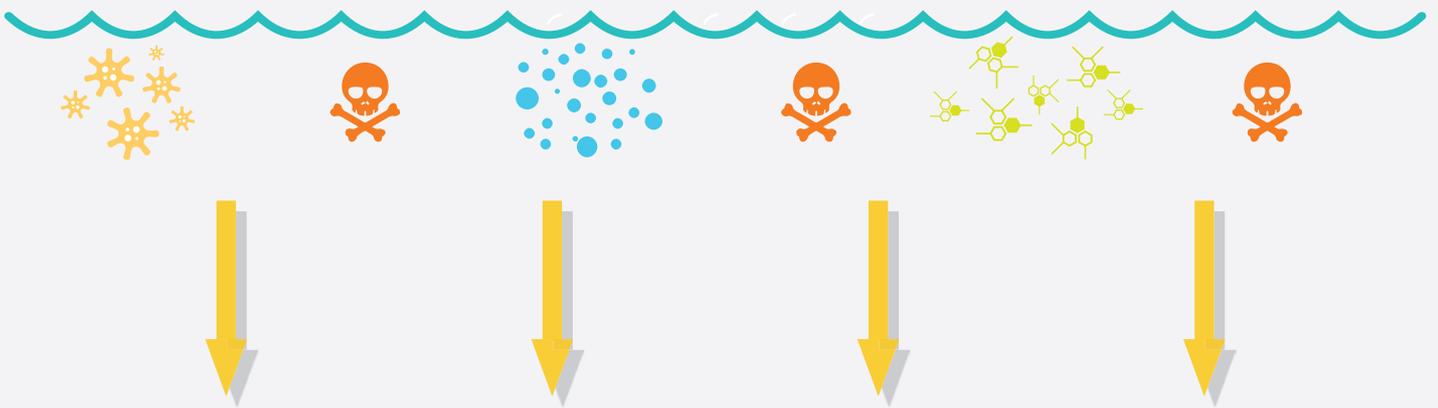
417 DEAD ZONES

THE WORLDWIDE NUMBER OF DEAD ZONES IN THE OCEAN DUE TO NUTRIENT POLLUTION

CHEMICALS WE DUMP IN OUR OCEAN

Every day around Australia we dump a toxic cocktail of pollutants from partially treated sewage and industry waste in to our oceans, estuaries and rivers. We are killing our oceans and risking our health.

SOME OF THE CHEMICALS FOUND IN WASTE WATER



(PFAS) per-and Polyfluoroalkyl
Substances, Perfluoro Octane Sulfonic Acid
(PFOS), **Macroplastics**, Microplastics,
Microfibres, Carbaryl, Diuron, MCPA,
Mecoprop, Simazine, Antibiotic Resistance
Genes (ARG), Microbeads, Nutrients, Total Nitrogen,
Total Phosphorus, **Algae**, Pathogens, **E.Coli**,
Thermo-tolerant Coliforms, Enterococci,
Helminth, oil, **Grease**,
Ammonia, **Virus**

PFAS OCEAN & RIVER POLLUTION – THE FACTS

PFAS ARE FOREVER CHEMICALS

PFAS: PER-AND POLY-FLUOROALKYL SUBSTANCES

PFAS IS USED DUE TO THEIR ABILITY TO REPEL BOTH GREASE AND RESIST HEAT. PFAS ARE USED IN A WIDE RANGE OF CONSUMER PRODUCTS, INCLUDING PACKAGING, NON-STICK COOKWARE, TEXTILES, MATTRESSES, HAIR PRODUCTS, SUNSCREEN, COSMETICS, MOBILE PHONES AND FIREFIGHTING FOAMS.

PFAS ARE CONSIDERED A THREAT TO FUTURE GENERATIONS OF BOTH HUMANS AND WILDLIFE.



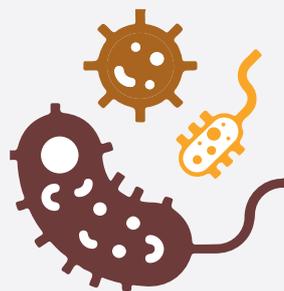
PFAS FROM BOTH HOUSEHOLD, BUSINESS AND INDUSTRIAL SOURCES IS ONLY PARTIALLY REMOVED BY MOST WASTEWATER TREATMENT MEANING CONTAMINATED WASTEWATER IS ROUTINELY DISCHARGED INTO WATERWAYS AND COASTAL ENVIRONMENTS.

PFAS ARE CALLED FOREVER CHEMICALS BECAUSE THEY DON'T BREAKDOWN AND TEND TO BIOACCUMULATE. THEY HAVE BEEN DETECTED IN ALL CORNERS OF THE GLOBE, FROM PENGUIN EGGS IN ANTARCTICA TO POLAR BEARS IN THE ARCTIC.

PFAS HAS NOW BEEN FOUND IN SEA SPRAY FROM SURF AND THIS IS NOW CONSIDERED THE BIGGEST SOURCE OF ATMOSPHERIC PFAS



PFAS HAVE BEEN LINKED TO CANCER, KIDNEY DISEASE, ELEVATED CHOLESTEROL LEVELS, BIRTH DEFECTS, DECREASED IMMUNITY, LIVER PROBLEMS AND A RANGE OF OTHER SERIOUS DISEASES. THEY ARE ALSO THOUGHT TO BE CONTRIBUTING TO PLUMMETING FERTILITY RATES WORLDWIDE AND THE GLOBAL OBESITY EPIDEMIC DUE TO THEIR ROLE AS HORMONE DISRUPTOR'S.



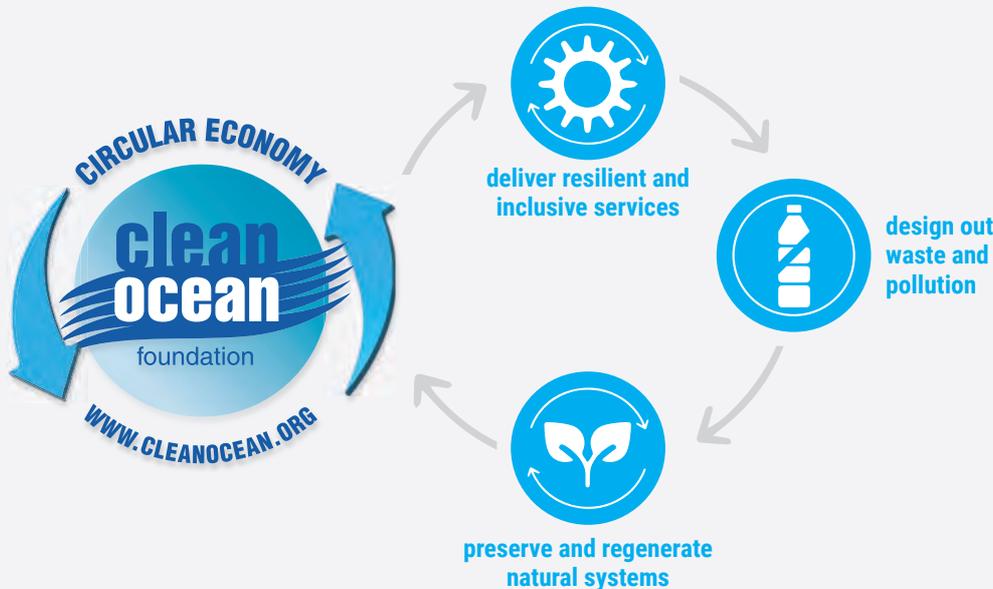
THE ONLY WAY TO SAFELY REMOVE PFAS FROM WASTEWATER IS TO ENSURE THE WATER IS PURIFIED RECYCLED WATER

SIGNIFICANT LEVELS OF PFAS HAVE BEEN FOUND IN DISCHARGES FROM BOTH EASTERN TREATMENT PLANT, CLASS A+ WATER AND THE WERRIBEE TREATMENT PLANT WATER

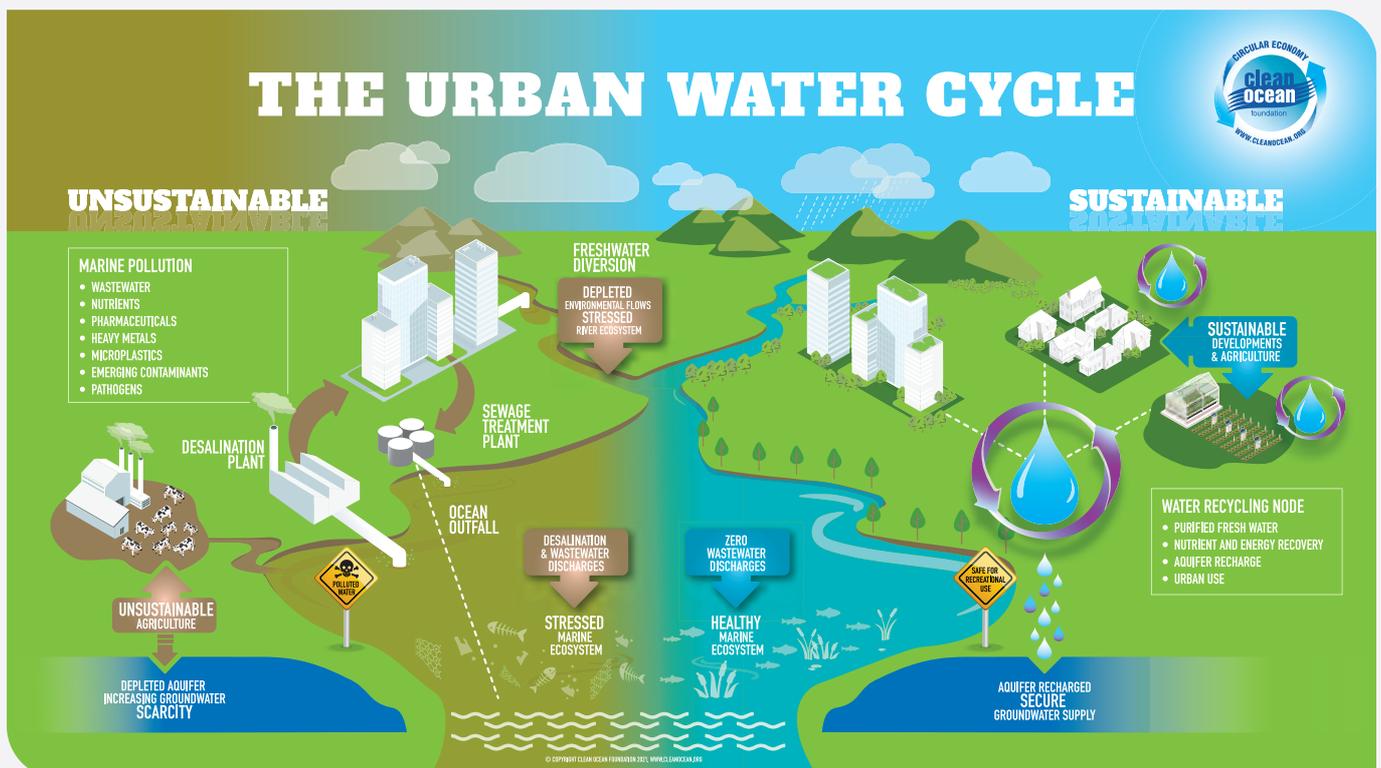
A BETTER WAY: A CIRCULAR ECONOMY

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What is a circular economy approach to water?
The World Bank says we need a circular economy approach to water. If we took this approach, it would;



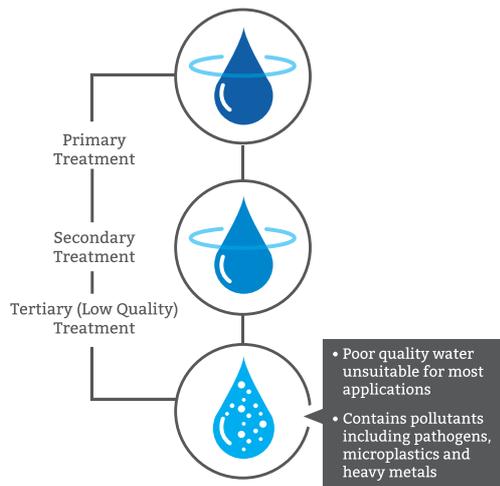
If designed well, advanced wastewater treatment plants can provide purified recycled water and stop ocean dumping. These plants are already successfully part of water grids in Perth, Brisbane and 33 other cities in the world.



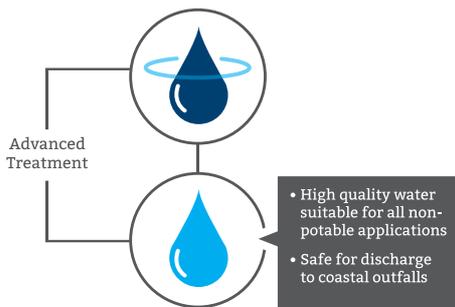
CLOSING THE LOOP: RECYCLED WATER

“It’s only waste water if you waste it”

Existing Treatment



Class A+ Treatment



Purified Water



WATER RECYCLING



STOPS OCEAN POLLUTION

Ethical upgrades of waste water treatment plants to make recycled water reduce ocean pollution. Advance purified recycled water technology does not produce a waste stream at all.



SAFE AND RELIABLE

Experts in Health, Science and Engineering developed stringent protocols for the use of recycled water for the Australian Water Recycling Centre of Excellence.



LIKE A NEW DAM

Because recycled water can be used more than once, an urban water grid that recycles is in fact as massive new dam, that is always full!



COST EFFECTIVE

In 2019, our preliminary study identified net benefits of 20-30 Billion of water was treated to Class A+ making it suitable for all non-potable uses. (The benefits are profoundly higher if treated.

CHALLENGES TO A CLEAN OCEAN

Speeding up the pace of reform on ocean pollution.

OBSTACLE

SOLUTION

Desalination is easier to sell to the uninformed public than purified, recycled water.	Insist purified recycled water be judged on its merits as a source of rainfall independent water.
Refusal to see ocean pollution and water recycling as related to each other.	Promote discussion and education on connection between the modern water cycle and ocean pollution with special attention to waste hierarchy. Entrench and extend community focused initiatives in the water sector related to.
Desalination is easier to sell to the uninformed public than purified, recycled water.	Insist purified recycled water be judged on its merits as a source of rainfall independent water.
Emotive 'YUCK' factor arguments associated with drinking recycled water.	Demand evidenced base deliberative processes, including citizens jury to consider under what circumstance recycled water be used.
Trade waste imposes significant burdens in relation to treatment of waste and water recycling options.	No longer should trade waste be subsidised by domestic users. Trade waste should always be treated to a level that does not unduly impact on any options for water recycling.
Political avoidance of responsibility due to cross-jurisdictional ambiguity (duck shoving between all levels of government).	Clean Ocean, Clean Water Act - Federal / State legislation must ensure circular waste from water treatment plants. NOUS 2030 - Adoption of National Outfall Upgrade Strategy 2030 National Water Authority to be re-established to include coastal community representation.

RECYCLED WATER: DISPELLING THE MYTHS

“It’s only waste water if you waste it”.

PURIFIED
RECYCLED WATER

DESALINATED
WATER

PRODUCES PURE WATER FOR ALL-PURPOSE INCLUDING POTABLE USE

Recent advances mean that depending on process, purified recycled water treatment require significantly less energy and produces no waste stream.



ECONOMICALLY THE MOST EFFICIENT SOURCE OF RAINFALL INDEPENDENT OF WATER

Desalination requires significantly more energy to produce water compared to recycling processes as well as expensive capital investment in relation to inlet and outfall streams.



REDUCES OCEAN POLLUTION

When an option to recycle water is ignored, every litre of desalinated water is responsible for 2 litres of ocean pollution



LOWER CARBON FOOTPRINT

Note until Australia is a least carbon neutral, green offsets to produce desalinated water is disingenuous. Recycled water using lower energy technology reduces the carbon footprint.



REDUCES RIVER POLLUTION

Recycling reduces pollutant load, whilst high energy costs in pumping make desalinated seawater for inland use.



REDUCES RISK TO RECREATIONAL USERS OF NEARBY WATERS

Upgrading existing plants reduces the risk of accidental exposure from wastewater discharges. Advanced water treatment plants can remove this risk.



REMOVES THE RISK OF FOREVER CHEMICALS ENTERING THE ENVIRONMENT VIA OUTFALLS

PFAs and other forever chemicals can enter sensitive riverine and coastal from wastewater discharges. Advanced water treatment plants can remove this risk.



REMOVES RISK TO MARINE LIFE FROM DEAD ZONES

Desalination outlet pipes create altered environments increasing the risk for opportunistic pest colonisation, constant risk of accidental exposure to treatment chemicals.



A CASE STUDY:

Eastern Treatment Plant (ETP) VS More Desalination

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COST

COST \$ PER MILLION LITRES	PURIFIED RECYCLED WATER ETP	MORE DESALINATED WATER
COST OF SUPPLY \$ (BASED ON 125,000 MILLION LITRES TO MELBOURNE WATER USERS IN 2022)	532	4952
BASED ON 150,000 MILLION LITRES MELBOURNE WATER USERS PER YEAR	\$66 MILLION	\$619 MILLION
NET BENEFIT TO VICTORIA OF ETP UPGRADE TO MORE DESALINATED WATER (YEARLY SAVING)	\$552 MILLION	ZERO

ENVIRONMENT

COST \$ PER MILLION LITRES	PURIFIED RECYCLED WATER ETP	MORE DESALINATED WATER
COST PER ML	LESS: 150,000 MILLION LITRES LESS POLLUTION	MORE: 150,000 MILLION LITRES MORE POLLUTION
EVERY 1 LITRE MORE OF DESALINATED WATER IS RESPONSIBLE FOR 2 LITRES OF OCEAN POLLUTION	FRACTION OF SAVINGS REALISED BY OPTING FOR ETP COULD BE REALLOCATED TO UPGRADE ALL VICTORIAN SEWAGE TREATMENT PLANTS TO ADVANCED TERTIARY	300,000 MILLION LITRES NEEDLESS OCEAN POLLUTION CONTAINING NUTRIENTS, HORMONE DISRUPTOR'S, PHARMACEUTICALS WITH DESALINATION, RISK OF INVASIVE SPECIES ETC

WASTED MONEY



SAVINGS FOR THE COMMUNITY



\$552 MILLION



NUMBER OF COMMUNITY HOSPITALS



10



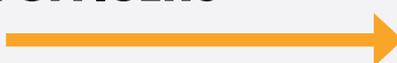
NUMBER OF NEW SCHOOLS CONSTRUCTION



18



NUMBER POLICE OFFICERS EXPENSES (FTE)



193

RECYCLED WATER: DEMOCRACY IN ACTION



DID THEY GET IT RIGHT FOR AUSTRALIA?

In regional Queensland in 2006 Toowoomba was in the grip of the millennium drought. In 2006, after an poorly conducted process of engagement, residents voted in a referendum to reject the proposal to treat their waste water to a potable standard.

FEAR AND IGNORANCE

From that day on, many Australian politicians have cited this result as reason to avoid consideration of recycled water. Many ignore the success of the Western Australian introduction of purified water to make up over 20% of metropolitan Perth drinking water.

CONSPIRACY

A key concern for these decision makers is that radical populists will exploit concerns related to the “yuck” factor and derail any evidenced based decision making process on potable water re-cycling.

THE OCEAN SUFFERS

Still in Victoria, water recycling is off the table. If this continues, our rivers and oceans will never be free of needless pollution from wastewater treatment plants whilst we build more expensive energy guzzling desalination plants. Reducing ocean pollution is a key benefit of recycling and it continues to be downplayed or ignored by decision makers.

RESTORING OUR OCEANS AND DEMOCRACY

With twenty years of community based actions, Clean Ocean Foundation believes that a deliberative process such as a Citizens' Jury can overturn this glacial pace of water reform, allay the concerns of the broader community in relation to the use of potable water and renew trust in the decision making process.

GLACIAL REFORM

Research and advocates within the water sector suggest that it takes up to ten years to successfully engage with community and educate them of the scientific facts that, when understood, results in acceptance for potable recycling. They've been saying that for ten years. See *Restoring Our Ocean and Democracy*.

ABOUT CLEAN OCEAN FOUNDATION

Clean Ocean Foundation is an Australian environmental charity, with tax deductible status. We seek to stop all forms of ocean pollution and restore our oceans to their former health.

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EARLY HISTORY

Clean Ocean Foundation was formed in 2000 by families, fisherman, and surfers who became concerned at the high level of pollution at Mornington Peninsula surf beaches such as Gunnamatta. The Foundation was successful in convincing the Victorian State Government to commit over 400 million dollars to upgrade Eastern Treatment Plant that discharges to Boags Rock Outfall near Gunnamatta beach.

Following this major victory, the Foundation works to minimise the environmental effects of wastewater on the marine environment from all of Australia outfalls whilst also ensuring a vital source of water on a dry continent is not wasted.

The Foundation has also been successful in lobbying the NHMRC for Australia's recreational water guidelines to be raised to match World Health Organisation criteria.

OUR PHILOSOPHY

Clean Ocean Foundation holds that the best way of minimising the impact of the waste from any land-based activity is for the waste to be retained on land wherever possible so its impact can be properly monitored and minimised. It is also dedicated to closure wherever possible of all ocean / sanitary sewer / sewerage / industrial discharges to all waterways and marine environments.

If this is impossible Clean Ocean Foundation demands that rigorous, ongoing, transparent monitoring in conjunction in line with community standards and world's best practice occur at each outfall.

CURRENT ROLES

Our mission is to "To protect our ocean ecosystem and establish truly circular approach to water and waste management."

In recent years Clean Ocean has attempted wherever possible, to work cooperatively with all levels of the water sector. This is to effect much needed change in the way decision are made by adopting a deliberative democratic approach to major infrastructure decision and fostering the adoption of a truly circular economy approach to water and wastewater.

RESEARCH

Clean Ocean Foundation also continues fundamental research into ocean pollution under the auspices National Environmental Science Program for the Marine Biodiversity Hub with maintaining and expanding the scope of the National Outfall Database which it established in 2015. The database identifies the location and composition of domestic outfalls on the Australian coastline.

HONEST BROKER FOR COMMUNITIES

Clean Ocean Foundation also continues to develop community capability to monitor the impact of these outfalls on recreational users and the marine environment.

COF also seeks to act as an honest broker by constructively supporting and empowering local community groups in the relation to ocean pollution issues.

In a legal first for Victoria this role became formalised when after appeals to VCAT, and under new environmental legislation, Clean Ocean Foundation was appointed as an Agency stakeholder in relation to the controversial Warrnambool Effluent problem.

CLEAN OCEAN CLEAN WATER

Clean Ocean Foundation believes that a transparent and evidenced based decision-making process related to water recycling and offers Australia a unique opportunity to profoundly reduce ocean and riverine pollution whilst providing water security for cities and regional areas alike.

The Clean Ocean Clean Water Policy will allow communities to properly assess the costs and trade-offs of a water reuse approach that will reduce the pollution dumped as effluent into their coastal and riverine environments.

Click to read more about **Clean Ocean, Clean Water**.

About what we do

www.cleanocean.org/about-us

Our Supporting Partners Program

www.cleanocean.org/supporting-partners.html

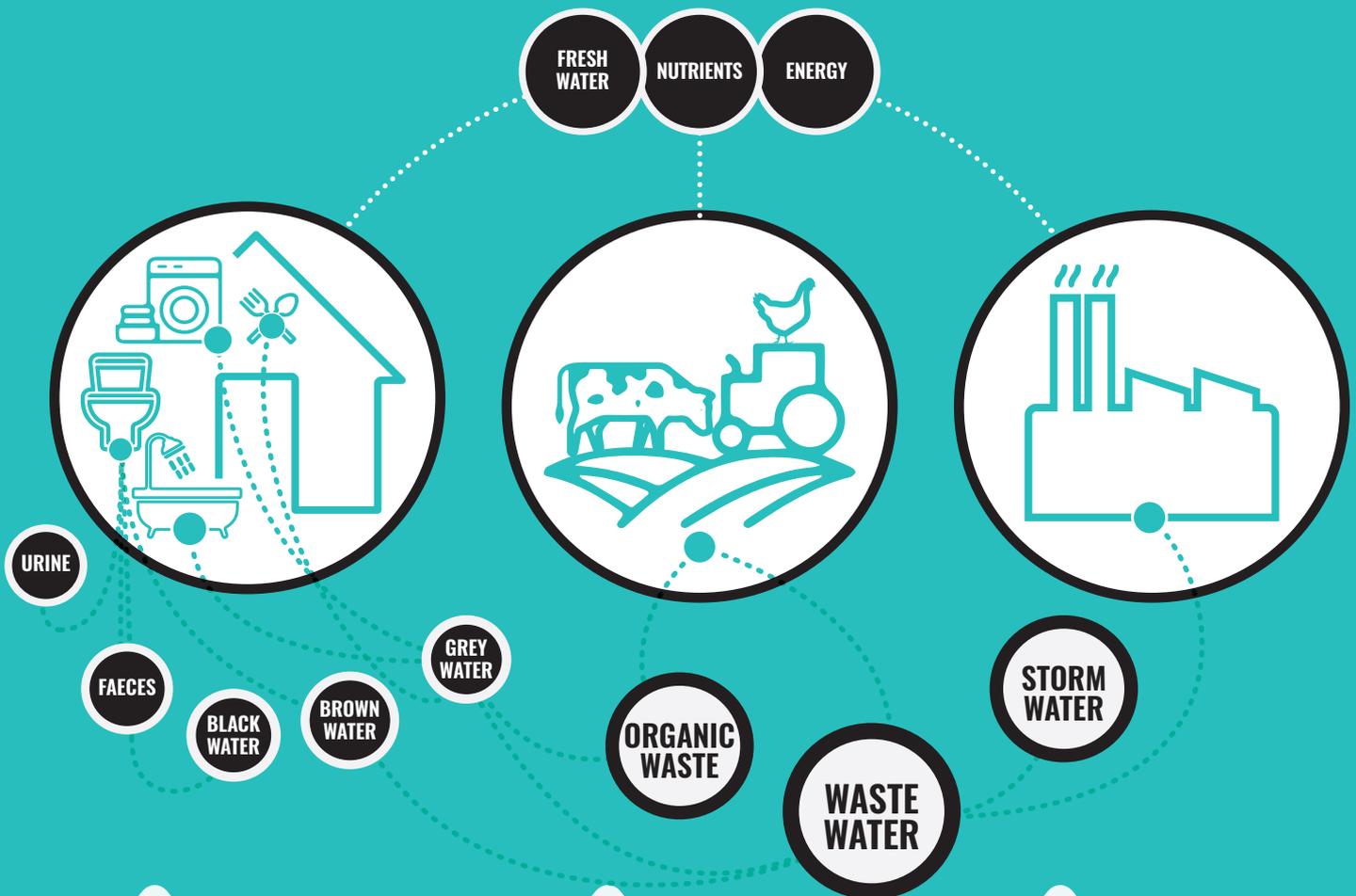
How to Donate

www.cleanocean.org/donate.html

www.cleanocean.org/about-us

ORIGINS OF WASTE WATER

Many domestic wastewater treatment plants also take industrial and agricultural waste. This adds significantly to the cost to process wastewater and also the amount toxic chemicals discharged as outfall pollution.



DOMESTIC SOURCE

- Washing / laundry
- Shower
- Kitchen
- Toilet
- Septic tank
- School
- Hospital
- Hotels / restaurant
- Office
- Small business activities, etc

AGRICULTURAL SOURCE

- Point Sources
- Poultry waste
- Piggery waste
- Silage liquor
- Dairy farming waste
- Vegetable waste
- Firewater
- Non-Point Sources
- Sediment runoff
- Nutrient runoff (Commercial fertilizer)

INDUSTRIAL SOURCE

- Abattoir
- Fertilizer
- Pulp & paper
- Textile
- Tanneries
- Dye processing
- Food processing
- Pharmaceutical
- Petrochemical
- Metallurgical
- Plastics industries, etc

DOMESTIC WASTE WATER POLLUTANTS

GENERAL POLLUTANTS

MAJOR POLLUTANTS

	Germs, Nutrients & Oil /Grease, Pharmaceuticals	Germs and excreted pharmaceuticals
	Germs, Nutrients & Oil /Grease, Pharmaceuticals	Cosmetics and sunscreen major pollutants
	Germs, Nutrients & Oil /Grease, Pharmaceuticals, Plastics	Cosmetics and sunscreen major pollutants
	Germs, Nutrients & Oil /Grease, Plastics, Forever Chemicals (PFAS Etc.), Herbicides, Pesticides, Insecticides	Microfibres, pesticides and forever chemicals in new clothes, nutrients in detergents
	Nutrients & Oil /Grease, Herbicides, Pesticides, Insecticides	Insecticides from flea powders
	Germs, Nutrients & Oil / Grease, Herbicides, Pesticides, Insecticides	Nutrients and oil and grease major pollutants

NATIONAL CLEAN OCEAN, CLEAN WATER 3-POINT PLAN



UPGRADE ALL OUTFALLS

Upgrade all outfall discharges to remove all contaminants of concern including PFAS and microplastics. Treatment level required is to purified recycled water.



POLLUTANT CAP NOW/DATE & ZERO BY DATE FOR AND RIVERINE AND COASTAL OUTFALLS

Stop the use of the ocean as a rubbish dump. Licence limits for all Australian sewage treatment plants and industrial outfalls to be capped by 2025.
No new domestic or industrial outfalls permitted.

Cease the discharge of all pollutants and other toxins into our coastlines and rivers from sewage treatment plants in Australia by 2035. This includes PFAS and other neuroendocrine disruptor's, pharmaceuticals, heavy metals, microplastics and other toxins.
Similar changes for all industrial pollution.



CITIZEN JURY/FORUM ON PURIFIED RECYCLE WATER FOR DRINKING PURPOSES

Research has shown community acceptance of purified recycled water for potable reuse is well received if enough time is taken to engage with the community. Let's start now by having a citizen jury to consider under what conditions Purified Recycled Water would form an acceptable part of our national water strategy.