PIONEER
WATER TANKS

AUSTRALIAN MADE & OWNED
SINCE 1988

BUSHFIRE PROTECTION WITH PIONEER

Discover the difference

THE PROBLEM

The risk of bushfires is a threat known all too well by Australians. The 2019-2020 bushfire season, also known as Black Summer, burnt 46 million acres of land, destroyed almost 3,000 homes and killed at least 34 people and 3 billion animals. It was an event like no other, and an event with potential to happen again.

The growing risk of bushfires is very real in Australia, with research showing bushfire conditions are more dangerous than in the past. The risk to people, animals and property has increased and the fire seasons have lengthened.

Pioneer Water Tanks has developed Australia's Ultimate Water Storage Guide for Bushfire Protection to prepare Australians for future seasons.

THE PROBLEM

In this guide, Pioneer Water Tanks will provide people living in bushfire prone areas with information on:

- Common mistakes people make before, during and after bushfire season
- How to reduce your risk and how to be prepared
- How on-site water storage will benefit you and your community during bushfires
- What water tank requirements you need for fire fighting
- Expert advice from Bushfire Prone Planning
- Why our customers choose Pioneer for their bushfire protection

If you live in a bushfire prone area and do not have a reticulated water supply, it is essential you have a water tank to ensure you have water supplies readily available to defend your home in the event of a bushfire.

Pioneer Water Tanks is determined to help Australians be prepared, take action and stay equipped to battle our bushfire seasons.

COMMON MISTAKES

Pioneer Water Tanks behind burnt poly tanks from the Black Summer bushfires in Kangaroo Island.

No matter where you live – whether it's in the city, small town or completely rural – bushfire preparedness is completely in your hands. How you prepare decides your and your property's safety and outcome.

Even if you plan to leave early in the event of a bushfire, you should still have a plan in place for your house and property. A well prepared and structured house is more likely to survive a fire than an unprepared one.

According to the Government of Western Australia Department of Fire & Emergency Services' Homeowner's Bushfire Survival Manual, a well prepared home means:

- **An easier home for you and firefighters to defend**
- **It's less likely to put your neighbours' homes at risk**
- **It will give you more protection if a fire threatens and suddenly you can't leave and have to take shelter within the home**

COMMON MISTAKES

As shown by previous bushfires over the decades, it's been made clear that "some houses are ill-prepared or built too close to a potential bushfire hazard and may not survive a bushfire. The construction standards, building protection zone and hazard separation zones need to match the potential bushfire threat for the predominant vegetation type and slope."

It is also a common occurrence that "too many people do not take even the most simple precautions to protect their homes, allowing grass, twigs and dead leaves and shrubs to build up around buildings and in gutters."

Unfortunately, it's mistakes like these that can make the difference in a property surviving or getting destroyed when a fire occurs.

Nigel McLean, Sales Team at Pioneer Water Tanks, says the most common mistakes people make before bushfires is not preparing for worst case scenarios, which can cause confusion and panic if a severe fire front affects a property.

"Having access to your water supply can be challenging during a bushfire – mains power usually fails and regular mains powered pumps may stop working," outlines Nigel.

"Backup generators can be used to run electric pumps, but these need to be regularly tested and maintained so they are ready for a potential bushfire. Petrol driven fire pumps can also be considered as an alternate way to get access to your water supply.

"In severe bushfires, diesel generators or diesel-driven fire pumps may be preferred as they can run when air is 'superheated' and/or oxygen levels are depleted from excessive smoke. Petrol driven generators or pumps can fail if there is too much smoke.

"Larger rural properties should look to have a portable firefighting unit so that fires can be reached where hoses cannot. These units can be a simple trailer with a 1000 litre tank with petrol or diesel fire pump connected with a fire hose."

It's important to maintain your fire-fighting equipment regularly and be familiar with their operating methods.

Tim Harper, Founder of Pioneer Water Tanks South Australia, says most people are unaware that Evaporative Air conditioners need a stainless mesh or some other means of protecting the house in their throat.

"A customer of ours had his evaporative Air Conditioner catch fire from Embers and fall into the house – the house may not have been lost had the fire protection screens fitted.

"A CSIRO scientist from the Bushfire Cooperative Research Centre explained that even without an ignition source (for example, leaves), two poly tanks that are stationed side-by-side won't just melt – they'll burn.

"A tank's job in a fire is to hold water for also putting out spot fires after the front has passed."

HOW TO REDUCE FIRE RISK AND BE PREPARED

If you live in a bushfire prone area, it is paramount you have a survival and management plan in place.

It's important to follow the requirements in local government fuel and firebreak notices to ensure fuel is managed and allow easy access for fire appliances in the event of a bushfire.

It's also handy knowing your asset protection zones and firebreak and fuel load information. This is different for each state and territory.

Aside from these key preparedness factors, having on-site water storage for fire protection services is a smart and effective way to mitigate risk and be ready.

In a 2006 study by Bushfire CRC, research was undergone to test how steel tanks and polyethylene tanks play a role in protecting homes from bushfires. Results found that BlueScope Steel® "performed the best under exposed conditions", with the structure maintaining integrity over a 30-minute flame immersion test. The Aqualiner FRESH® tank liner "retained water during and after the fire-front", which is vital for the protection of a property.

On the other hand, polyethylene tanks suffered "considerable structural distortion during simulation of a bushfire passage." The tank split, melted down and proved to be a risk of total failure when adjacent combustible items were present.

Research outcomes showed "spiral-wound steel tanks performed best under all exposure conditions." This research indicates that "steel construction tanks have the greatest chance of retaining their structural integrity and preventing water loss under bushfire conditions, while polyethylene tanks are at risk of total failure when adjacent combustible items are present, such as heavy forest fuels, fences, structures or even other polyethylene tanks."

Bushfire CRC's extensive research has showcased multiple times that steel tanks are highly recommended for people living in bushfire prone areas. It is important to know that when selecting a tank to install for fire protection that there are certain requirements and guidelines that must be met in order to be fully functional for fire use.

THE SOLUTION

In this section we outline the water tank requirement guidelines for bushfire protection, what kind of tank is best, water tank accessibility and pumps, and what steps to take after a bushfire.

It's important to note that in Australia, each local council may have a different perspective on what fire reserve is needed at a particular property. It is vital to contact your local council to ask what their requirements are for your particular site address.

Some councils require the fire reserve to be in a separate tank from your main water storage tank if you use the main tank as a household water supply. Councils can require amounts of water to be available that can range between 10,000-20,000 litres for the fire reserve.

THE SOLUTION

Water Tank Requirements and Guidelines

It is required to ensure water availability is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.

Non-reticulated areas require water tanks meeting the following criteria:

- Volume: Minimum 50,000L per tank
- Ratio of tanks to lot: Minimum 1 tank per 25 lots
- Location: No more than 2km to the furthest house site within the development (to allow 2.4 fire appliances to achieve a 20-minute turnaround time at legal road speeds)
- Hardstand and turnaround areas suitable for 3.4 fire appliance (ie. kerb-to-kerb 17.5m) are provided within 3m of each water tank
- Water tanks and associated facilitations are vested in the relevant local government

What Kind of Tank?

As previously explored, non-combustible steel tanks offer the greatest protection from bushfires.

Various local governments recommend tanks with a 50mm camlock compatible with fire truck fittings.

- You must ensure to check with your local government authority regarding their specifications so that fittings, couplings and adaptors match
- Planning approval requirements
- Volume: Minimum 50,000L as per guidelines

Water Tank Access and Water Pumps

Water tank accessibility:

- Location adjacent to the house (or other catchment surface) at elevations that allows water to flow from gutters into the tank
- Fire valve fittings, access hatch and ladder required where hardstand and turn around points are to ensure easy access

Water pumps:

- Generator or petrol/diesel pump may be required to use water supply to defend home in event of power outage
- Generator will need to have more than a 1.5 kVA capacity to power an electric pump

Hoses:

- Hose nozzle specifications (30-100L per minute)
- Reticulation system loop set up

THE SOLUTION

Pioneer Water Tanks Expert Advice

Pioneer Water Tanks would like to highlight that in the first instance of choosing fire-fighting water storage, the property owner should familiarise themselves with expert fire-fighting guidelines and consult local fire authorities.

You should develop a well thought out fire plan and have backups or alternatives in accordance with varying fire conditions or situations.

Laurie Mitchell, Engineering Manager at Pioneer Water Tanks and Engineers Australia representative on the Australian Standards Committee for AS2304:2019 "Water storage tanks for fire protection systems", says tanks from Pioneer are specifically designed to withstand fire.

"The steel body design with its profiled panel, as well as the steel roof structure and roof sheets, provides the best protection against fire, as has been demonstrated at the CSIRO testing station."

Nigel McLean, Sales Team at Pioneer Water Tanks, explains Pioneer Water Tanks' process in ensuring a fire water tank is set up for success – from the moment of assessing a customer's property to installation day.

"It's important that the customer contacts their local shire prior to tank installation to ask if there are any specific fire reserve requirements or fire fittings for their block," Nigel explains.

"It's also important the customer has a BAL (Bushfire Alert Level) assessment completed for their property.

"We need to know if the customer requires a fire reserve for a Commercial Shed or Workshop that is required to meet the Australian Standard AS2419. This standard specifies requirements for the design, installation and commissioning and testing of fire hydrant installations that are used for the protection of buildings, structures, storage yards, marinas and associated moored vessels, wharves and plant."

THE SOLUTION

What advice does Pioneer Water Tanks give to people living in bushfire prone areas when considering water storage on their property?

Consider what type of tank you're buying; as we covered earlier, purchasing a metal liner tank gives the best chance for your water supply to remain useable during and after a bushfire.

Poly tanks melt and accelerate combustion as they are petroleum-based plastics, and concrete tanks can fail as the internal metal rebar expands and causes the concrete body to explode.

"Metal liner tanks, when exposed to high temperatures, will suffer from melted internal liner only above the water level. Below the water level, liners will usually not get damaged as the water will not get heated enough to melt the liner," says Nigel.

"This allows the tank to remain usable during and after a fire when the water supply is most critical. Metal tank bodies will have accelerated corrosion and diminished structural integrity and will require replacing in the months following the event, however the importance of having usable water during and directly after the fire should not be underestimated."

Also, consider having a dedicated fire reserve; tanks can have a combined fire reserve outlet and general usage outlet in the one tank.

"The fire reserve can be positioned so the general usage cannot use the fire reserve amount. If you do have a combined fire and general usage tank, this could suffer from cross contamination if a fire truck connects to your tank.

"Some water may flow from the fire truck into the tank before it starts sucking water into the fire truck. This can be an issue if the fire truck has fire retarder missed in the fire truck water."

It's important to ensure there is sufficient room around the tank for service vehicles to get access to the fire reserve outlet, and that you have sufficient independent water supply.

Consider the positioning of a dedicated fire tank on your property in the most likely fire vulnerable location so you have the water where it is needed most.

Water Tanks Post-Bushfire

It's important to assess the water tank structural integrity after a bushfire, as well as any risk of contamination. You may need to drain, repair and refill the water tank.

The below information has been referenced from the Government of Western Australia Department of Health.

If your water has been contaminated you shouldn't use it to drink, make ice, prepare foods, wash and bath, clean teeth or water animals with.

You can assume the water in your tank has been contaminated if:

- Your roof is covered by ash or other fire debris
- There are dead animals on your roof or gutters or in your tank
- You think that your roof was covered by fire suppressant water either dropped by aircraft or sprayed from ground units
- The tank has been burnt by fire and the internal lining material is damaged
- The plumbing to or from the tank is damaged
- The water is cloudy, tastes or smells unusual or has an unusual colour
- The water contains debris or ash
- The water level has increased

Before emptying your water tank if contamination has occurred, be sure that:

- The tank or any associated pipework has not been damaged by fire
- The tank has been desludged and cleaned, if contaminated, by a specialist contractor

Do not reconnect your down pipes until your roof and gutters have been cleaned or rainwater from the first rains after the fire has been run to waste.

EXPERT ADVICE: BUSHFIRE PRONE PLANNING

Bushfire Prone Planning is a bushfire risk management company that offers state-wide BAL (Bushfire Attack Level) Assessments & BMP (Bushfire Management Plans) in Western Australia. They have Level 1, 2 & 3 consultants based in the Perth Metro and Margaret River Region.

The following information is from the Bushfire Prone Planning team that was specifically created for this e-book. They outline further direction on guidelines, requirements, tank specifications, accessibility, post-bushfire plans and other ways you can prepare.

EXPERT ADVICE: BUSHFIRE PRONE PLANNING

Figure 2: Polyethylene (plastic) water tank melted by bushfire

What are the Guidelines?

The 'Guidelines for Planning in Bushfire Prone Areas' ensures that bushfire protection measures are incorporated into the planning and development processes in designated bushfire prone areas. Amongst other factors, bushfire risk assessments must address the four bushfire protection criteria requirements: location, siting and design of development, vehicular access and water.

Element 4 relates to the availability of water to ensure people, property and infrastructure can be defended from a bushfire. In non-reticulated areas it is a requirement that water tanks are provided, with a hydrant or standpipe, for firefighting purposes.

Figure 1: Steel water tank unaffected by bushfire

Water Tank Requirements

Within the Guidelines:

- Minimum 50, 000 litres per tank
- Minimum of 1 tank per 25 lots (or part thereof)
- Tank no more than 2 kilometres to the furthest house site within the residential development
- Hardstand and turn-around areas suitable for 3.4 fire appliance (kerb to kerb 17.5m) are provided within 3 m of each water tank
- Water tanks and associated facilitates are vested in the relevant local government

Figure 3: Firefighting valve location on water tank emergency reserves

Aside from the requirements for water tanks outlined in the 'Guidelines', you should always check with your local council regarding their specifications. Various councils recommend tanks with a 50 millimetre camlock compatible with fire truck fittings. The placement of the firefighting valve on your tank will be located below any domestic use valves to ensure you always have water reserves available for a bushfire emergency (Figure 3).

What Kind of Tank Should I Use?

Non-combustible metal tanks offer the greatest protection from bushfires. Research from Bushfire CRC has confirmed that spiral-wound steel tanks retain their structural integrity during bushfire conditions whereas polyethylene (plastic) tanks can easily collapse and melt, consequently losing all their water (Figure 1 and 2).

How Do I Make Ensure My Water Is Accessible?

Location

The location of your tank is important to ensure water is easily accessed in the event of a bushfire. Water tanks should be situated adjacent to your house at an elevation that allows water to flow from your gutters into the tank. Vegetation or any other nearby flammable material should be cleared around your tank prior to fire season and non-combustible fire valve fittings and access hatch are ideally positioned where your turn around point is located.

Reticulation System Loop

To ensure you can defend your home from a bushfire you can set up a reticulation system loop surrounding your house. To do this, you must have hoses that can reach around the full perimeter of your home when attached from the pump. Your hoses should be able to withstand high temperatures and deliver 30-100 litres of water per minute. When designing your reticulation system, also make certain to use metal pipes or bury plastic pipes at least 30 centimetres underground to prevent them from melting (see Figure 4).

Water Pumps

In the event of a bushfire, there is also the possibility of losing mains power. To be prepared for this, a generator or petrol/diesel pump is necessary to ensure water availability to your home if a power outage occurs. A generator must have more than a 1.5 kVa capacity to power an electric water pump. It is important to ensure that both generators and pumps are protected from a bushfire's radiant heat by placing them in a shed or under another form of protective covering. You should ensure that everybody on your property knows how to operate the pump and that is maintained throughout the year.

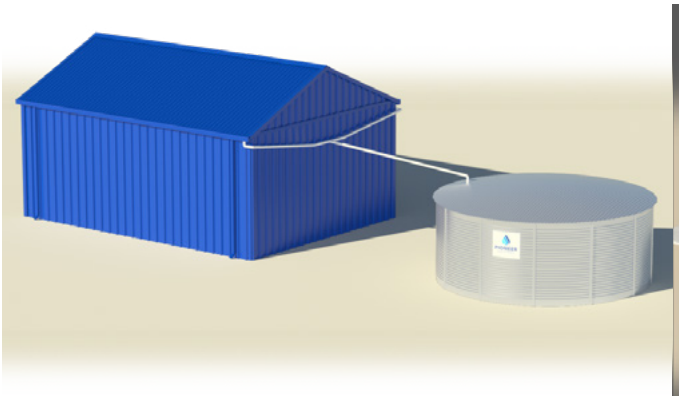

Figure 4: Pipes running directly from the roof to water tank should be made from metal to prevent damage from radiant heat

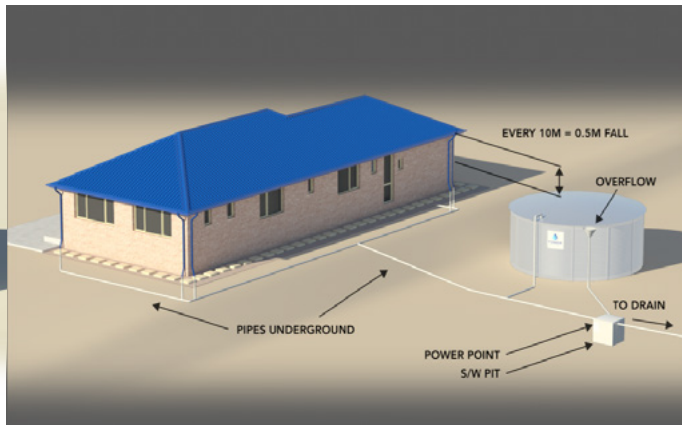

Figure 5: Plastic pipes, running from the downpipes to the water can, can also be used but should be sunk underground to protect them from damage from radiant heat

EXPERT ADVICE: BUSHFIRE PRONE PLANNING

Water Tanks Post-Bushfire

If you are unfortunate enough to have your property affected by a bushfire, there is a possibility that the structural integrity of your water tank may be compromised. This may also lead to a risk of contamination of your water supplies which, although may still be suitable for defending your home, is not potable water and is not safe for consumption. This is more likely with polyethylene tanks or steel tanks with a bladder lining. There are various signs that your water may be contaminated including:

- Ash, debris or fire suppressant water on your roof or in your gutters
- Your tank or piping to and from the tank is damaged
- The water is cloudy, containing debris or ash, and may have an unusual odour or colour

If you suspect that your water tank supplies are contaminated you can have the water tested and you may need to have a professional drain, repair and refill the tank. For more information visit the Department of Health.

Other Ways You Can Prepare

There are various other precautions that you can take to ensure that you are prepared for a bushfire. Some of these measures includes:

- Having a bushfire survival plan and/or bushfire management plan in place
- Managing vegetation on your property and following your local council fuel and firebreak notice requirements.

For additional information contact your local council or visit the Department of Fire and Emergency Services website.

State Bushfire Authority Websites

NSW Rural Fire Services

- Bushfire Resources

Northern Territory Government

- Bushfire Information

Queensland Fire and Emergency Services

- Bushfire Awareness

South Australia Country Fire Service

- Bushfire Publications

Tasmania Fire Services

- Bushfire Publications

Country Fire Authority (Vic)

- Bushfire Publications

Department of Fire and Emergency Services (WA)

- Bushfire Publications

Additional Information

Bushfire CRC's Performance of rainwater tanks in bushfire conditions

DFES Homeowner's Bushfire Survival Manual

Healthy WA's Rainwater tanks after a bushfire

NSW RFA Bushfire Survival Plan

CFA Fire Ready Kit

VBA's guide to retrofit your home for better protection from a bushfire

PIONEER WATER TANKS CASE STUDIES

With over 30 years of experience servicing Australians with quality water storage solutions, Pioneer Water Tanks has installed countless tanks for fire protection purposes.

Here we share the real stories of bushfire victims and how quality water storage has helped them protect themselves from further bushfire risk.

Peter and Anna Cormick, Deua River Valley, NSW

The devastation left of Peter and Anne's property - everything destroyed except their 15-year-old Pioneer Water Tank.

Peter and Anne Cormick from the Deua River Valley in NSW devastatingly lost their family home during the Black Summer fires of 2019/2020.

On New Year's Eve, the fires started to severely hit the area, and over the next three weeks the couple had to evacuate their property five times. But on Wednesday 22 January they were optimistic – rain had finally come and the temperature dropped, persuading Peter to unhitch the trailer and unpack their bags.

But on Thursday 23 January, when they were hit with a strong wind at around 10.30am, running at about 100km/h by 12:30pm, they were re-packing to evacuate once again. They escaped just after 1pm.

On Friday, the couple found out every single structure on their property had been destroyed – except for their 92,000L Pioneer Water Tank.

When the area was eventually cleared, it took 60 semi-tippers to clean up the rural property of destroyed structures and burnt vehicles. The only thing that wasn't removed was the tank, which had been on the property for at least 15 years.

When Peter and Anne discovered this structure had survived the inferno, they were astounded.

"You come back to a place where, just two nights before, you were sleeping and walking around and sitting down at the kitchen table, and all of that was just utterly destroyed," Peter told Pioneer Water Tanks.

Just a few days after losing their home, Peter and Anne fortuitously met retired Air Commodore John Oddie at the recovery centre in Bateman's Bay, who was helping people re-establish themselves. He's well-known for leading the Australian response to the 2004 tsunami in Indonesia.

Peter and Anna Cormick, Deua River Valley, NSW

"Through John we ended up engaging with a company by the name of Stack Space, which produces container houses in a grand-design style; and that's what we're putting on the property now."

In late April 2020, Peter reached out to Pioneer Water Tanks for assistance. He was after an additional Pioneer Water Tank to be built alongside his existing one, ideally at a reduced price.

Pioneer Water Tanks were quick to get involved in the provision of water storage tanks for homes to be re-built in the fire devastated areas.

The Pioneer team, alongside Dealer Direct Network® member Aquaflo Irrigation, worked with Peter to install a GT130 (130,000L) on his property.

Unfortunately, the fire didn't leave the existing tank completely unscathed – a small part of the Aqualiner FRESH® tank liner had been impacted by the fire, allowing water to escape.

This damage occurred in a section above the water line, near the top, because of a burning tree just a few metres from it. Peter said that had it been filled to the top, there would have been no damage.

When the new tank was installed in late July 2020, installation team leader Jacob discovered exactly what the problem was. He came back to everything and ensure the existing tank continues to provide safe, fresh water for years to come.

Peter's new Pioneer Water Tank

Heidi Wade, East Lynne, NSW

Destroyed concrete tanks on Heidi's property

Heidi was another victim of the Black Summer fires. Her family lost all their out-buildings, including their granny flat, two stables and two sheds. Their two plastic/fibro water tanks were totally destroyed, and the two concrete tanks were severely damaged, along with the water pumps and piping to the house.

When considering new water storage options at the time of re-building, Heidi looked at a variety of brands that would suit her property and future threats of bushfires.

"What drew me to Pioneer Water Tanks was actually my friends – they have one of the tanks and had excellent things to say about the brand and quality," Heidi told Pioneer Water Tanks.

Heidi's local company from the Pioneer Dealer Direct Network® was NSW Water Tanks. Owner Operator Joel Flood processed the quote and organised installation of a GT110 (110,000L).

"We wanted a larger tank than our previous so we wouldn't run out of water."

Heidi now has a sufficient, reliable water source not just for her house supply but also for bushfire protection.

Heidi's new Pioneer Water Tank

Tim Harper, Founder of Pioneer Water Tanks South Australia

Figure 10: Dublin SA fire tank

Pioneer Dealer Direct Network® member, Pioneer Water Tanks SA, has set a target for 100 Community Fire Tanks across the state - providing 21,600,000 litres of fire water to SA's 61 CFS Tankers to be available at the beginning of any fire.

Community Fire Tanks allow bulk carriers and tankers to fill with their onboard pumps, sucking from 100mm or 125mm fittings in minutes. Mains water standpipes are 50-80mm and rely on available water pressure only.

The concept of a community fire tank was born out of the aftermath of the devastating Ash Wednesday fires back in 1983 – a day which saw 28 deaths in South Australia as a result of the catastrophic firestorm conditions that swept across SA and Victoria.

"Dave Sanders, the Greenhill CFS Captain at the time, came and saw me in 1989 to buy a tank – they'd been raising funds since 1983 and were ready to order their own community fire tank for Greenhill," explains Tim.

"They were after a local tank as every time they'd had to re-fill their truck, they'd had to go all the way through the smoke to Norton Summit."

"By the time they'd gotten back to Greenhill they'd lost another one or two homes."

Fast forward 32 years to the Pinery Bushfires in 2015: that same community fundraising spirit was evident again, stemming from days of devastation that burnt over 210,000 acres across the lower Mid-North and western Barossa Valley.

Tim Harper, Founder of Pioneer Water Tanks South Australia

Figure 11: Grace Plains SA fire tank

"The Adelaide Plains football league got involved immediately afterwards to raise funds and decided as a committee to use the money to put towards preparing for that inevitable next fire," says Tim.

"They decided they would put big fire tanks around the Plains and now have seven big GT250 tanks with huge fire fittings."

The GT250 fire tanks (250,000L) are the ideal community resource. People can fill up the tankers with their pumps infinitely faster than trying to draw it out of the mains pipeline thanks to a special suction used in the tank.

The recent 38th anniversary of Ash Wednesday offers a timely reminder for communities to be at the ready. Tim is working closely with Alex Zimmerman, former Pinery Bushfire Government Recovery Coordinator and ex-Senior Policeman, to spread the message.

"People in other regions need to realise they need storage in their district so when the fire happens, they've got the tankers filled and can fill the fire front appliances in a fraction of the time," says Tim.

"We've been out in the Adelaide Hills visiting different locations to work out the best places to put these tanks and then try and get funding."

"Alex has further been working with local committees and council groups to put together a grant application with Minderoo (Twiggy Forrest's foundation) and they've since had three of the eight tanks funded."

A community fire tank can change a communities' bushfire response by helping protect life, livestock and property. A large water tank can be the difference you and your family need to survive.

Bushfire safety is something you can never over-prepare for. Having a secure, reliable, safe water storage facility on a property in a fire-prone area will have direct impact on life and death during such horrible events.

To learn more about water storage for fire protection, click here.

Click here to speak to a Pioneer Water Tanks representative about bushfire preparedness.

PIONEER
WATER TANKS

Toll Free (in Austalia): 1800 999 599

International Phone: +61 8 9274 4577

International Fax: +61 8 9274 4588

Email: commercial@pioneerwatertanks.com.au

pioneerwatertanks.com.au