



Royal Commission into National Natural Disaster Arrangements

Submission Form

Please complete this form if you would like to provide input or comments about coordination, preparedness for, response to and recovery from the 2019-20 'Black Summer' bushfires.

Personal and Background Information

1. **Full Name** Alistair Graham
2. **Email** [REDACTED]
3. **Mobile/Telephone** [REDACTED]
4. **What is your preferred method of contact if we want to follow up with you?**

email

5. **The Commission would like to understand the views of community groups based on their respective experiences and background.**

- a. Please select Option 1 if you are providing input and comments primarily based on your personal situation.
- b. Please select Option 2 if you are providing input and comments primarily based on your professional knowledge, qualifications or experience, or on behalf of a group or organisation

Option 1: Based on your personal situation, please complete the following.

- a. What was your personal situation in relation to the 2019-20 Bushfires? Please choose all that apply.
 - I was not living in an area affected by bushfire
 - I lived in an area affected by bushfires but was not evacuated, and didn't suffer personal or financial loss
 - I lived in an area affected by bushfires and was evacuated, but didn't suffer personal or financial loss
 - I lived in an area affected by bushfires and was evacuated, and I suffered personal or financial loss
 - I was part of the emergency response as a fire fighter on the ground
 - I was part of the emergency response as an aerial fire fighter

- I was part of the emergency response as health professional
- I was part of the emergency response as an Australian Defence Force member
- I was part of the emergency response as a Commonwealth or State government employee
- I assisted the emergency response as a community support volunteer
- I assisted the emergency recovery (i.e. after the fire event) as a community support volunteer
- Other

b. Where do you live? Please provide your Local Government Area, town name and post code.

Local Government Area Choose an item.

Town name

Post code

Option 2: Based on your knowledge, qualifications or experience, or your role representing a group or organisation, what is your area of expertise? Please choose all that apply.

- Emergency/disaster response and/or management
 - Environment/land management
 - Land use, planning, building standards
 - Impacts of changes in climatic conditions
 - Wildlife conservation
 - Traditional land and fire management practices of Indigenous Australians
 - Community welfare
 - Other
-

Input / Comments

6. In your experience, what areas of the bushfire emergency response worked well?

The fire-fighting ground crews worked as well as could be expected given that their equipment is inadequate to extinguish or contain any but the least intense fires.

7. In your experience, what areas of the bushfire emergency response didn't work well?

Cannot comment usefully as emergency response options are rudimentary in relation to the potential power of bushfires

8. In your experience, what needs to change to improve arrangements for preparation, mitigation, response and recovery coordination for national natural disaster arrangements in Australia?

As long as individuals & towns are allowed to exist in fire-prone forests disasters are inevitable, The same goes for inhabited floodplains. Unless forests are fragmented by numerous, wide fire-breaks disasters are inevitable with only rudimentary fire-fighting capability.

9. Is there anything else you would like to tell the Royal Commission?

I have published (attached) a new concept for extinguishing bushfires in their early stages. I believe the concept is worth the expense of full-scale field testing, because if it proves workable it would revolutionise bushfire response capability. The attachment is a reprint from the current issue of the Journal of Emergency Management, titled. Extinguishing wildfires by saturation water bombing: a new concept

10. Do you intend to provide supporting material?

- Yes
 No

If you are providing any supporting material, please include it with your Submission if possible. If you need to send it separately (e.g. if you make a Submission over the phone), please ensure supporting material can be clearly identified as relating to your Submission by including your name or other identifier so that it can be considered with your Submission.

11. Do you agree to your submission being published? (Mandatory)

- Yes, I agree to my submission being published in my name
 Yes I agree to my submission being published anonymously
 No I don't agree to my submission being published
-

Once you have completed this form, email it to rcnda.submissions@royalcommission.gov.au or print the form and post it to the Royal Commission at:

National Natural Disaster Royal Commission

Locked Bag 2000

Manuka ACT 2603



Extinguishing wildfires by saturation water bombing: A new concept

Alistair Graham, MSc

ABSTRACT

Objective: To present a new concept for the extinguishment of wildfires by saturation water bombing.

Design: Following an exhaustive literature search, a published mathematical model and a published empirical rainfall model were used to estimate the rate at which water would have to be applied to extinguish intense wildfires. Applying the estimated amount by quasi-continuous saturation water bombing was then evaluated.

Results: The mathematical model yielded a regression equation that estimates the amount of water to extinguish wildfires of varying sizes as $y = 0.1041 x - 5.0096$ where y is the quantity of water and x is the size of the fire. The predicted quantities of 1000 metric tonnes ha for intense wildfires vastly exceed the minimum of 50 metric tonnes ha of the empirical rain model, likely due to the limited data available. They nevertheless serve to define the likely range of water application rates that must be applied for wildfire extinguishment. These application rates are shown to be feasible by deploying a team of large, amphibious water scooping aircraft operating in relay continuously day and night. The operating cost of such a team (\pm \$10 million annually) is trivial compared to the potential for reducing the current economic burden of US wildfire of \$71.1-347.8 billion annually.

Conclusions: The saturation water bombing concept seems promising enough to warrant the commitment of funds to implement field trials on the ground that it could, potentially, result in savings of billions of dollars.

Key words: area of the active combustion zone, arson, cost, concept, economic burden, economic consequences, extinguish, fire intensity, fire line, flame

length, fuel, heat release rate, lightning, mitigation, mortality, model, nozzle, penetration, rain, retardant, water, wildfire

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DOI:10.5055/jem.2020.0447

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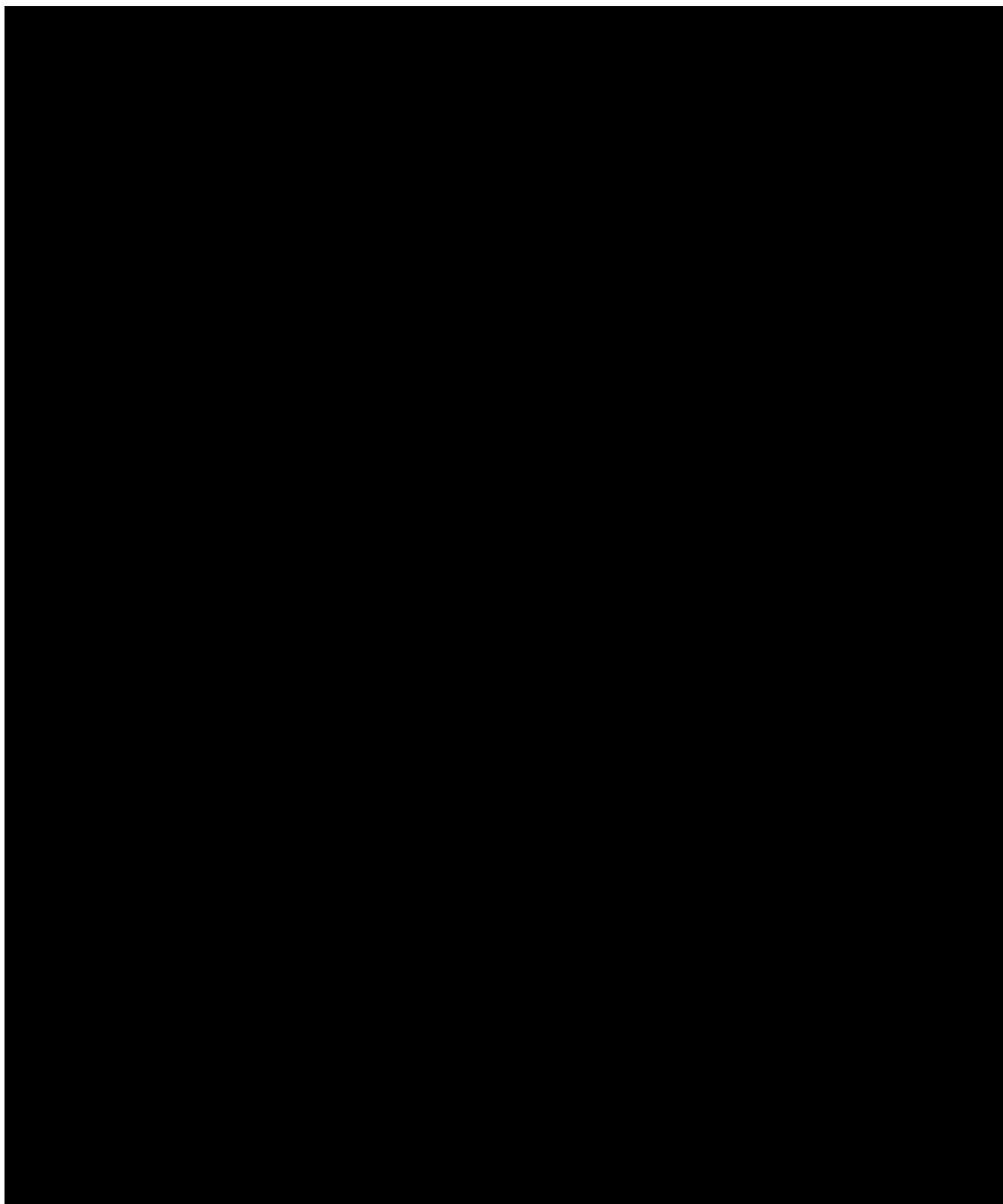
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