BEFORE THE COMMISSIONERS APPOINTED BY THE CENTRAL OTAGO DISTRICT COUNCIL

UNDER	the Resource Management Act 1991
IN THE MATTER	of RC230179 an application for a 30-lot subdivision at Rocky Point on Tarras-Cromwell Road (SH8)
BY	**TKO PROPERTIES LIMITED**
	Applicant

STATEMENT OF EVIDENCE OF JAMES PATRICK COWAN

Dated: 4 November 2024

TODD & WALKER law
LAWYERS | NOTARY PUBLIC

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Statement of evidence of Jamie Cowan

Introduction

[1] My name is JAMES PATRICK COWAN (known as Jamie).

[2] I am the Director of Wildfire Management NZ Ltd.

[3] I provide a wide range of services relevant to fires in the natural environment (Wildfires) including but not limited to, investigations, Wildfire Threat Assessment (**WTA**), mitigation strategy advice such as vegetation management, landscaping requirements, low flammability plantings, firebreaks/green breaks, external sprinklers, water supplies, construction materials, evacuation planning and safety zone identification.

[4] I contract to Fire and Emergency NZ (**FENZ**) to provide incident management support nationally and internationally for the management of active wildfires including fire behaviour analysis, operational management, and other roles as required.

[5] I provide training to FENZ in large incident management and simulated wildfire events, and currently supporting the development of the NZ advanced fire behaviour course, where I have been identified as a future tutor.

[6] My Qualifications relevant to the wildfire field are as follows:

(a) Advanced Diploma of Public Safety (Fire Investigation) Canberra Institute of Technology (2023).

(b) Advanced Wildland Fire Behaviour S-490 (Canada 2020).

(c) National Certificate ‘Fire and Rescue Services’ (Vegetation) L5 (2019).

(d) New Zealand Fire Service ‘F1, Structure Fire Investigation Course’ (2017).

(e) Fire and Emergency NZ Wildfire Investigator L2.

(f) Unit Standard 10615 Investigate Origin and Cause of Vegetation Fires (2011).

(g) Canberra Institute of Technology PUAFIR604A - Determine Origin and Cause of Structure Fire (2017).

(h) Canberra Institute of Technology PUAFIR501B - Conduct Fire Investigation and Analysis Activities (2018).

(i) Canberra Institute of Technology PUAFIR606A - Apply Principles of Combustion and Fire Dynamics to Fire Scene Investigation (2020).

(j) Canberra Institute of Technology PUAFIR608 - Investigate Fatal Fires (2021).

(k) Canberra Institute of Technology PUAFIR607 - Apply Electrical/Electronic Knowledge to Fire Investigations (2022).

(l) Canberra Institute of Technology PUALAW004 - Give Evidence in a Judicial or Quasi-Judicial Setting (2022).

(m) Emergency Management Professionalisation Scheme (EPMS, AFAC) Registered Fire Investigator.

[7] My experience relevant to the wildfire field is as follows:

(a) I have worked in the wildfire field since 2006, when I was employed by the Department of Conservation with part of my role as a Fire Fighter/Fire Risk Manager.

(b) I have been warranted as a Rural Fire Officer (RFO) since 2007 and have attended hundreds of fires and controlled burns in this capacity.

(c) I became a wildfire investigator in 2010.

(d) I was employed by the Otago Rural Fire Authority in 2014 as a Deputy Principal Rural Fire Officer (DPRFO).

(e) I started my own company (Wildfire Management NZ) in 2017 and contracted to the then Otago Rural Fire Authority and latter Fire and Emergency NZ as a RFO and wildfire investigator.

(f) I was appointed to the National Rural Fire Authority (NRFA) National Incident Management Team (NIMT) in 2014. I filled many roles in this national team including Fire Behaviour Analyst, Situation Unit leader, Deputy Operations Manager and Planning and Intelligence Manager.

(g) I have completed 10 international deployments since 2012, five to Canada and 5 to differing states of Australia. I have filled multiple roles including Fire Fighter, Crew Leader, Fire Behaviour Analyst, Planning Manager and more recently as the lead for New Zealand as the International Liaison Officer.

(h) I have been deployed to many of the large fires within New Zealand in varying roles including Fire Behaviour Analyst, Sector Supervisor, Deputy Operations Manager and Planning Manager.

(i) I currently provide training to Fire and Emergency NZ in:

(i) Large incident management with simulated fire exercises,

(ii) Tutor for the FENZ Incident Management Team, Planning Manager course,

(iii) Currently building the FENZ advanced fire behaviour and fire behaviour analyst courses of which I am identified as a future tutor.

Code of Conduct for Expert Witnesses

[8] I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023. This evidence is within my area of expertise, except where I state that I am relying on material produced by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Scope of evidence

[9] My evidence addresses the assessment and mitigation of wildfire risk to the proposed dwellings and future tenants of the Rocky Point development. These include:

(a) WTA - Defined by the former National Rural Fire Authority NZ as:

> *"A systematic method of identifying the level of threat a particular area faces from wildfire. The level of threat is generally related to a combination of ignition potential, potential fire behaviour and the values threatened.*
>
> *These factors may themselves be derived from other combinations of factors, for instance, potential fire behaviour can be determined from a combination of climate, topography, and fuels."*

(b) To come up with an overarching "Threat" from wildfires, the WTA is made up of three layers:

Risk – This is essentially the potential for ignition and the ability for a fire to spread to any given area/location. In New Zealand, fires are mainly caused by people and their activities so areas with higher populations generally have a higher risk. Areas where accessibility brings people into the back country also have a higher risk, i.e. trails, etc.

Hazard – This is the potential fire behaviour and considers fuel load and weather, i.e., areas of high hazard will have a high level of flammable vegetation fuel such as scrub, tussock, wilding pines etc and have a dry and/or windy climate. These factors are used to determine the Rate of Spread (**ROS**) and Head Fire Intensity (**HFI**) for a given area/location.

Values – These are the values threatened by a wildfire and include such things as life, property and areas of aesthetic, recreation, conservation, historic or cultural significance.

(c) The above three layers are then combined to create the "Threat" layer or model. This threat level is generally identified by a

numerical value; however, for simplicity I use the “Low, Moderate, High, Very High, Extreme” wildfire rating scale.

(d) Radiant heat flux calculations, used to determine the survivability of an existing or proposed building. This calculation can then be used to determine mitigations such as vegetation removal or management, the need for external sprinklers and the suitability of construction materials.

(e) Other wildfire mitigation factors such as firebreaks, green breaks, low flammability plantings, ember suppression, water supplies and evacuation planning.

Process

[10] I was contracted by TKO in early September of 2023 to carry out a WTA and to provide advice on mitigating any identified risks.

[11] To complete the WTA several site visits were carried out along with discussions with the development team.

[12] Subsequent to the provision of the WTA report and mitigation advice, I have worked with CKL engineers to provide advice on the water volume and pressure required for external vegetation and ember suppression sprinklers.

[13] I have worked with Beale Consulting (ecologist) to provide advice on low flammability plant species and planting locations.

[14] I have engaged with FENZ including a site visit to obtain their advice on the proposed wildfire mitigation strategies. FENZ will provided a letter acknowledging the risk, proposed mitigations and their suitability.(I have not received this at the time this submission has been prepared)

[15] I have provided advice and reviewed TKO Fire Risk Management Plan that will set out how the services management company (**RPSL**) will manage the ongoing risk of wildfire on behalf of the residents.

WTA and mitigation summary (extracts from reports and advice provided to TKO)

[16] The following is a summary of the WTA findings.

[17] Given the prevailing winds, potential ignition history and locations, vegetation type and slope factors, the most likely scenarios that would result in a threat to the proposed building platforms are from a fire starting downslope to the west off or near to the highway or powerline corridors.

[18] The overall WTA and risk rating for this site is assessed as **High**.

[19] Based on this rating, Rocky Point developments should include wildfire risk management strategies into vegetation management strategies, construction and building material guidelines, landscape and planting plans, wildfire detection, general site practises and future activity trigger points and evacuation plans.

[20] The following is a summary of the identified mitigation strategies.

[21] The landscape values are high with much of the property in ONL, as such the removal of vegetation may not be possible or practical, as such the following minimum mitigation strategies should apply:

(a) As per FENZ publications, Zone 0 (Within 1.5 m of structures) should be cleared of all flammable material.

(b) As per FENZ publications, Zone 1 (1.5 to 10m of any structures) should be “lean and clean” by removing any significant flammable vegetation and trimming lower branches of any remaining trees ensuring they are well spaced.

(c) Replacement and further plantings should be of low flammable species.

(d) Work with CODC to support the maintenance of the campground reserve below the Rocky Point Development to ensure long grass, weeds and scrub are kept to a minimum between the highway and the camping/parking areas.

(e) External vegetation sprinklers should be installed to apply a minimum of 3mm rain equivalent within 15 minutes across the gully heads leading up to the proposed dwellings. This is the next best option if vegetation cannot be removed. **Note:** NZ does not have standards or regulations on external wildfire sprinklers, as such advice has been obtained from overseas standards and publications.

(f) External ember suppression sprinklers should be installed on dwellings to minimise the potential for ember ignitions. The number of sprinklers required on each building will need to be determined at the time of building by a suitably qualified person.

(g) External sprinkler systems must have the ability to be remotely and/or automatically activated.

(h) External sprinkler systems must have enough water holding capacity to run for a minimum of 90 minutes per site and run multiple sites simultaneously.

(i) Architects and engineers should be made aware of the Australian Standard, AS3959, *Construction of Buildings in Bushfire Prone Areas*. **Note:** NZ does not have standards or regulations on construction in wildfire prone areas, as such, advice has been obtained from overseas standards and publications.

(j) All building materials (including any spouting, decking, fencing and anything attached to any dwelling) should be able to withstand a radiant heat flux of 22kw/m^2. If not, additional surface flooding external sprinklers should be installed. This should be assessed by a suitably qualified person at the time of building.

(k) Any voids or openings such as eaves, under flooring/decking should be blocked off, or have fine mesh (2mm openings) to prevent embers blowing in.

(l) Adequate number of fire detection sensors to be installed (Attentis or similar, number to be confirmed at final design stage).

The type of sensor being installed must be able to detect a fire in its early stages, provide for warning messaging, and provide visual or electronic confirmation of where a fire is at any given time to allow for the timely activation and targeted application of external vegetation/structure sprinklers (ideally 15 minutes prior to the fire's arrival).

(m) The powerline that runs mid-slope through the property should be placed underground to prevent the potential for an electrical ignition.

(n) All purchasers of building sites should be made aware of the wildfire risk and necessary mitigation measures.

(o) A minimum of two vehicular access/egress routes should always be available.

(p) The vineyards to the east of the property can be utilised by foot traffic as a safe zone in the event of a fire.

(q) Trigger points derived from temperature, wind speed and relative humidity should be developed to manage ongoing activities with Rocky Point such as the use of grinders, welding, lawn mowing, chainsaws, outdoor fires, public access and any other potential ignition source.

[22] The above recommendations for vegetation and ember sprinklers have been catered for by CKL in their water supply and reticulation plans, however, further work is required to finalise the sprinkler design and activation prior to installation.

[23] The Fire Risk Management Plan will need to be reviewed before it is formalised into the RPSL structure. This should include the recommended mitigation measures above.

[24] The requirements for external ember and/or additional sprinklers designed to wet structures will need to be assessed at the time of building consent relevant to the chosen building materials and proximity to flammable vegetation by a suitably qualified person.

Limitations

[25] Wildfires are extremely unpredictable events and could start in locations not identified by any assessment, or in fire weather conditions not considered by any assessment, thus resulting in wildfires that may breach any identified mitigation strategies resulting in property loss, injury, or death. WTA and advice is based on a fire occurring at Fire Weather Indices less than 40 FWI (<Very Extreme) unless stated otherwise.

[26] External wildfire sprinklers are designed to spray water onto buildings and vegetation surrounding the building. Due to the unpredictable nature of wildfires, there is no guarantee these sprinklers will prevent any building or vegetation from burning and/or obtaining fire damage. Further to this, wildfires burning under extreme weather conditions may exceed the mitigation provided by any such external wildfire sprinkler systems and damage or destroy the buildings that they are hoping to protect.

[27] External wildfire sprinkler systems should be seen to assist with wildfire mitigation, that can help with reducing the impact of any wildfire, but not a guaranteed solution that will protect buildings and vegetation in all circumstances.

[28] I am not qualified to comment on construction and/or building code requirements for wildfire prone areas. NZ has no regulations or standards relevant to construction in wildfire prone areas as such my advice is based on overseas standards and publications.

[29] NZ has no guidelines or standards for external wildfire sprinkler systems as such, all recommendations are provided based on information available at the time (for instance, including overseas research and publications and from my own experience).

Comments on s42A addendum

[30] I provide comments below in response to remaining matters related to risk of fire contained within the s42A addendum report:

[31] [Page 17] *"Plantings in the vicinity of dwellings, in addition to kanuka, is proposed to be limited to those listed in Clause B3(f) of Mr Baxter's proposed design controls. I note that none of the species provided are listed in FENZ's list of species with different flammability ratings. However, based on the characteristics of the plants (Typically dryland species with lots of woody, densely packed growth, small leaves and low retained moisture content) relative to plants with low or moderate flammability characteristics in FENZ's list, I think it is unlikely that these species will have low flammability risk."*

(a) See 21, a,b,c above. As per FENZ publications, low flammability plantings are required around dwellings. Such as Griselinia, Coprosma Lucida and other more succulent species.

[32] [Page 17] Sprinklers are proposed to be installed on the uphill approaches to most dwellings where the adjoining hillside is scrub covered, in order to help slow the spread of fire towards the dwellings. I understand that these would primarily seek to provide a deluge of water, dampening and cooling burning and unburning vegetation and the ground. 340m3 of water is proposed to be retained for this purpose. It is not clear from the application how much time this volume would allow the sprinklers to run. However, I am satisfied that they would have, at least some benefit in slowing the spread of fire, allowing time for residents to react to a fire that threatened their site

(a) See 21 h, above. 90 Minutes.

[33] Page 17 - *Fire breaks are proposed in the fire management plan. It is not clear from the plan where these will be or their required length and width, and the possibility of permanent fire breaks has not been considered by Mr Beale, Mr Lloyd or Mr Baxter in their respective assessments. While I accept that fire breaks are a useful method for managing the spread of fire between different areas, I do not consider that their potential ecological and landscape effects have been considered by the application to be satisfied that their effects will be*

acceptable. Conversely, I cannot be satisfied from the information provided that the management of wildfire will adequate if the fire breaks are removed from the plan, as that scenario has not been considered by the applicant.

(a) Firebreaks were initially recommended along the eastern side of the highway opposite the council reserve/camping area and boat ramps. After further investigation, I have deemed it more appropriate to support CODC if possible, to better manage the fire risk on the western side of the road to slow any fire spread towards the highway to prevent it crossing.

(b) To place a firebreak on the eastern side would be difficult given the terrain (rocky, steep) and it is better to stop a fire crossing the road, than try and prevent it spreading once it has crossed. Acknowledging that the maintenance on the reserve may be out of the developer's hands, however as this is the best solution, I believe it should be investigated before alternative methods such as sprinklers be evaluated.

[34] Page 18 - *In Paragraph 6.95 of the original s42A report I noted that the proposal created a situation where 30 developable allotments in an area with vegetation that might be prone to wildfire had one point on ingress or egress that may be blocked by fire. I invited FENZ to comment on this aspect as they see fit, while noting that they did not raise this as a concern in their submission. The amended proposal keeps the same single point of access but reduces the number of lots reliant on it to 26, and proposes more active measures to help slow the spread of fire towards buildings. I consider that this lowers the risk. However, I still invite FENZ to comment of whether they are comfortable that this arrangement will not result in an unacceptable risk to the safety of occupants of the subdivision, or on fire crews, or if a more formal second point of access to the subdivision would be preferable*

(a) See 21o and p above. Two access/egress roads are required.

(b) On the FENZ site visit (30th Oct 24), the developer assured FENZ that two vehicular access roads would be provided alongside the ability to maintain walking access out into the vineyards to the east. FENZ indicated that this would be acceptable, however I do not have that in writing at the time this submission was prepared.

Conclusions

[35] I have assessed the risk to the proposed Rocky Point development at Bendigo associated with wildfires.

[36] An initial WTA was completed to determine the potential for a wildfire to impact on this site, and the mitigating factors to reduce a wildfires impact to an acceptable level.

[37] These mitigation recommendations have for the most part been built into the current development proposal. As the development progresses these will need to be reviewed and refined.

[38] The developers are committed to ensuring that fire risk management is a key component of this project with a large investment in vegetation and ember attack suppression sprinklers proposed. It should be noted that suppression systems of this type are new to NZ and that the Rocky Point Development proposal is leading the way from a national perspective.

[39] I am confident that the resource consent proposal sets out to mitigate the risks from wildfire to an acceptable level, notwithstanding the limitations addressed above.

[40] I acknowledge that this is early in the process, revisions are expected, and parts of the recommended mitigation will form part of the services proved by RPSL once the development gets to the building stage.

James Cowan
4 November 2024