The Harmans Valley lava flow and its tortuous path

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Abstract

The Harmans Valley lava flow, south of Hamilton in Western Victoria, originates at the Mt Napier volcano and meanders its way across the landscape along a pre-existing valley. The renowned Byaduk lava caves occur within the flow. The flow itself is about 40,000 years old and is regarded by many experts to be the best example of a lava flow constrained by a valley and having one of the most intact and significant collections of young volcanic features in Australia. The flow also has aboriginal and early-European cultural heritage significance as well as dramatic landscape values. While the meandering route of the flow could be described as tortuous, the path to protecting this iconic feature has been, and continues to be, even more tortuous.

The Mount Napier volcano and the upper part of the flow, containing many of the Byaduk caves, are protected as they are in the Mount Napier State Park. However, for most of its length, the Harmans Valley flow is on privately-owned land where until recently, features on and in the flow, including caves, had been afforded very little if any protection, despite lobbying efforts over many years.

In 2004 and in 2015-16, some parts of the flow were bulldozed, crushed and levelled to improve farming potential. This obliterated some surface features and, as the most significant damage was in areas that are visible from a public viewing point, the landscape significance has diminished.

In October 2016, the Victorian Government imposed a Significant Landscape Overlay (SLO), in effect a landscape protection control, on those parts of the flow that lie on private land within the Southern Grampians Shire. Unless replaced by a permanent SLO, the interim SLO will expire on 31 October 2018.

This paper reviews efforts to protect the flow and its important geological, landscape, ecological and cultural features and considers the likelihood of achieving effective permanent protection.

Introduction

The Harmans Valley basalt lava flow in Western Victoria originated at Mt Napier and flowed down a pre-existing valley (Figure 1) for more than 20 kilometres in a westerly then southeastly direction. For most of this distance, the flow is located within the Southern Grampians Shire, but the last several kilometres fall within the Glenelg and Moine Shires and in these lower reaches, much of the flow is swamp covered, with no outcrop.

Figure 1: Harmans Valley lava flow as it was in 1975, with Mt Napier clearly visible in the background

The remarkable Byaduk lava caves occur within the flow and in addition, many surface features of the flow are still visible, including Tumuli, or lava blisters, lave lakes, levees and examples of a'a and pahoehoe lavas. The flow is regarded by experts as the best preserved in Australia and is very important for education and research purposes. Much of what we know about the features of the flow comes from the work of Ken Grimes (Grimes, 2010), a geologist, speleo and former ACKMA member who passed away suddenly in 2016. The flow also has aboriginal and early-European cultural heritage significance as well as dramatic landscape values, which were also noted by Ken.

Mt Napier and the upper part of the flow, containing many of the Byaduk caves, are protected as they are within the boundaries of the Mt Napier State Park. However, most of the flow is on private property (Figure 2) where, until recently, it had been afforded not much protection at all.

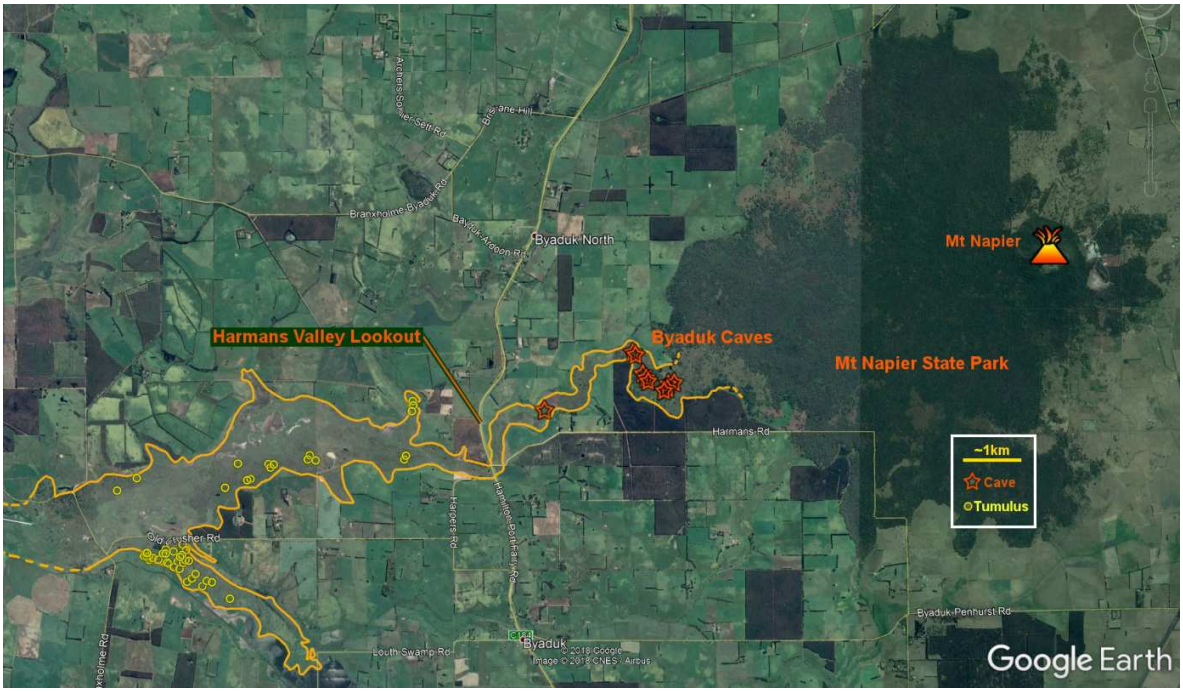

Figure 2: Major features of the Mt Napier State Park and Upper Harmans Valley

In 2004 and again in 2015-16, some sections of the flow were bulldozed and levelled, an operation called rock crushing, to improve its farming potential. The rock crushing operations obliterated some surface features and, as the most significant damage has been in areas that are visible from a public viewing point (the Harmans Valley lookout), the landscape significance has been diminished.

Geological setting

The Harmans Valley area lies within the Newer Volcanic Province (Figure 3), which covers an area of 25,000 Km² in Western Victoria and southeast South Australia (Cas, 2018). It is intra-plate continental basaltic province that has been active for around 8 million years. It comprises extensive lava flows, scoria cones and more than 400 eruption sites. Some of the oldest eruption sites are in the north and in the east near Melbourne and the most recent eruption occurred at Mt Shank (near Mt Gambier) just 5,000 years ago. However, based on the limited amount of dating work carried out to date, there is no obvious migration pattern of volcanism across the province. Available data suggest that volcanism occurred in particular parts of the province at different times but more age data is required to detect any patterns (Cas et al., 2017). On the basis of the dating data, and given the number of eruption sites, Cas (2018) suggests eruptions occur every 15,000-20,000 years and that since the last eruption was only 5,000 years ago, further eruptions are likely in the future. He considers that as the Newer Volcanic Province is the only still-active volcanic province in Australia, it is of national scientific significance.

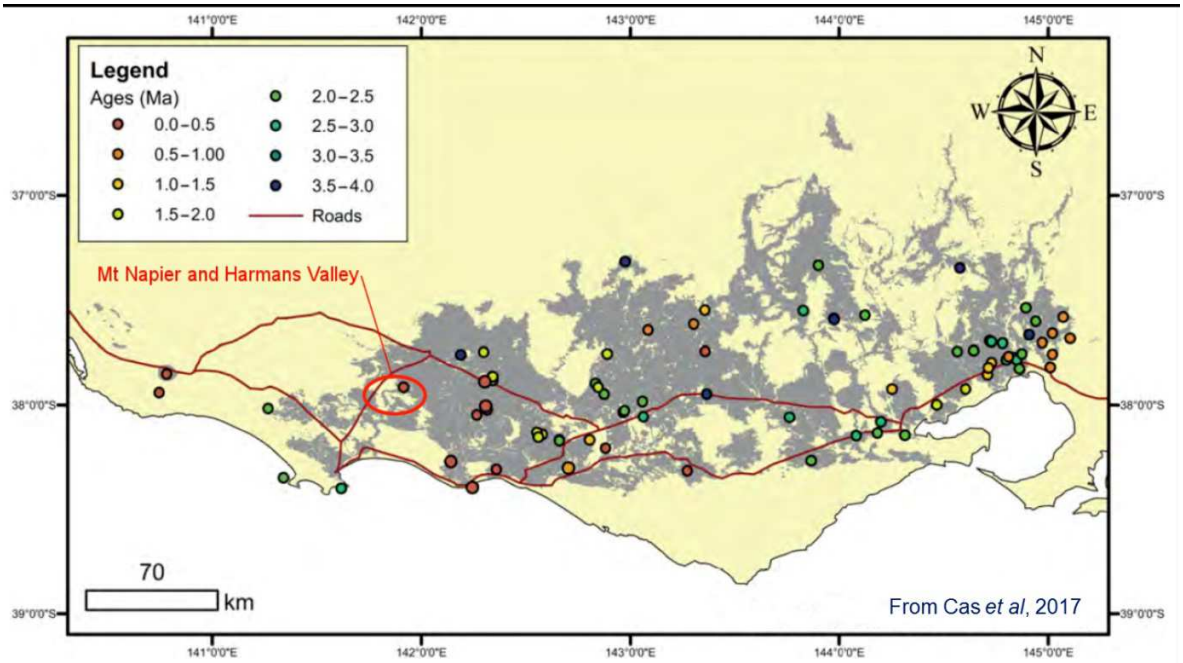

Figure 3: The Newer Volcanic Province of Western Victoria and southeast South Australia

Mt Napier, the source of the Harmans Valley flow is close to the more recent end of the spectrum. The latest studies point to an age of about 40,000 years (Cas, 2018). In geological terms, this is very young and explains why many surface features of the flow are still visible and why a range of dramatic lava cave features remain intact.

Features of the flow

From a speleo's perspective, the most important features of the Harmans Valley flow are the caves (Figure 4). As already noted, many of these are within the Mt Napier State Park and as such, their status is not at issue here. In addition, caves are known to occur in other parts of the flow. Ken Grimes documented a number of these, but access constraints limited the thoroughness of his work. A large entrance occurs in the middle of the area rock crushed in 2004 and 2015-16 (Figure 5). It does not appear to have been damaged, but Ken considered it likely that at least one other small cave was obliterated.

Figure 4: Cave entrance in the Mt Napier State Park

Figure 5: Large collapse entrance in an area subjected to rock crushing in 2004 and 2015-16

From a geological perspective, the most striking features are the tumuli (Figure 6), or lava blisters as they are sometimes called. These are steep-sided mounds of rock up to 10m high and 30m across that are thought to result from underlying pressure of lava forcing up the solidifying, but still plastic, surface of the flow. It is possible that steam, generated where the lava flows over wet or swampy areas, played a role in their formation. The tumuli are more common in areas where the lava flow is thin, such as near the edge of the flow and in side valleys. Tumuli occur in some volcanic areas overseas, but they are generally of a much smaller size than the ones found in Harmans Valley.

Figure 6: A tumulus, or lava blister, on the Harmans Valley lava flow

Other features of the flow include lava ridges, hummocky terrain (known locally as stony rises), lateral levees, lava canals and drained lava lakes, as well as smaller-scale features such as columnar jointing and pahoehoe and a'a surfaces. While these are common in volcanic areas, they are invaluable at the state and national level for education and research purposes as the Harman's valley flow is relatively intact, very young and readily accessible.

Rock removal and quarrying operations

The first inhabitants of the area (ancestors of the Gunditjmara people) fashioned loose basalt boulders into shelters. Foundations of these structures can still be seen in the area.

Since the early days of European settlement, people have been continuing to modify the surface of the flow. At first, farmers improved the grazing value of their land by picking up loose rocks and using them to build dry stone walls (Figure 7). Later, farm tracks were pushed across the flow. As the rocky ground also proved to be a readily available source of material, rock was removed by the truckload for road construction works in the district. There are also several small quarries in the area where the aim was to dig beneath the basalt to access the underlying limestone, which was in demand for agricultural and construction purposes.

Figure 7: Typical dry stone wall fashioned from loose blocks of basalt

None of these small-scale operations had a major impact on either the important geological features of the flow or on the overall landscape vista, such as is visible from a public lookout beside the Hamilton-Port Fairy Road. Indeed, one of the valuable landscape attributes of the area is now considered to be the dry stone walls. They are also regarded as contributing to the cultural significance of the area.

In mid-2004, heavy machinery was used to break up and flatten an 800 metre long section of flow to the east of, and visible from, the lookout. An area of approximately 15 hectares was crushed and 'surplus' rock was pushed into several large heaps.

In November 2015, after a change in landowners, the area crushed in 2004 was re-worked and in July 2016, another 5 hectares to the east of the earlier work was crushed (Figure 8). During this period the number and size of the rock heaps increased.

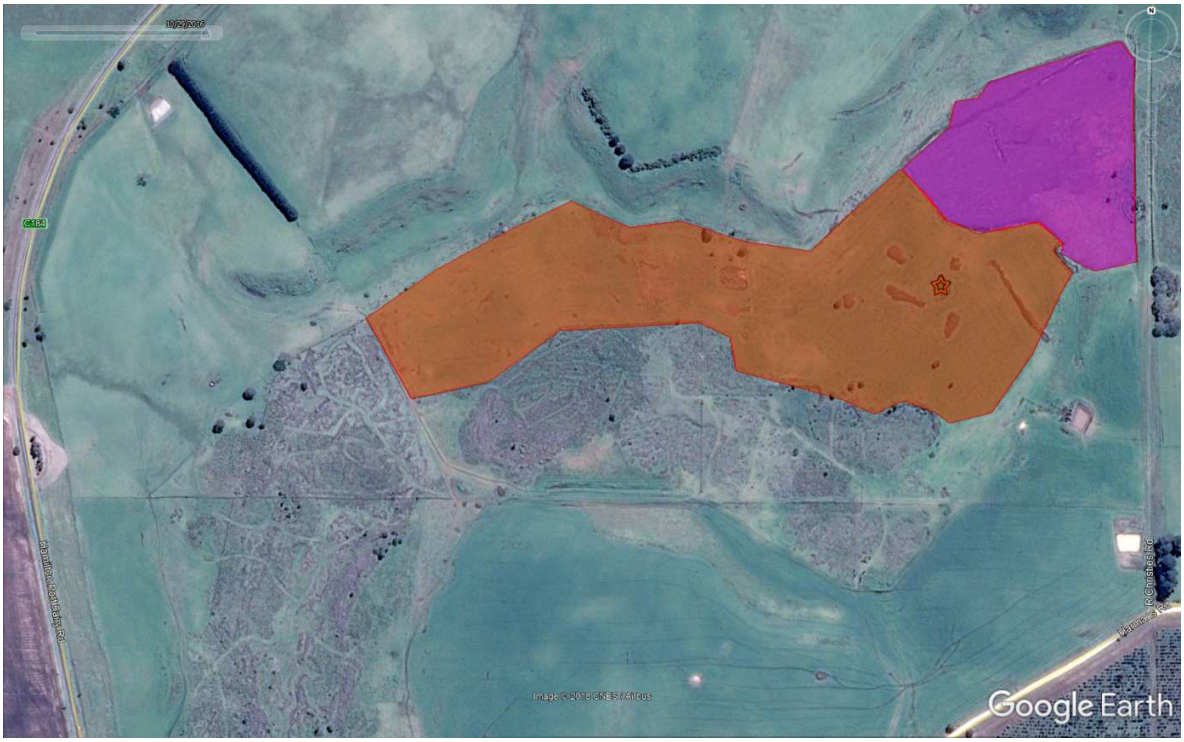

Figure 8: Satellite imagery showing the area of rock crushing in 2004 and 2015-16. The magenta shaded area is the new area crushed in 2016

Moves to protect the flow

In the 1990s the Victorian Division of the Geological Society of Australia assigned the Mt Napier volcano area, including the Harmans Valley flow, National significance as a Geological Heritage feature (Rosengren, 1994). It also assigned individual listings to three sites within the valley: the Wallacedale Tumuli were assigned international significance as particularly well-formed examples of lava mounds or "blisters" and the Byaduk Caves and the Great Barrier, a lava levee feature, were assigned national significance. The current status of the listings cannot be ascertained, but in any case they afforded no legal protection. In Victoria, there is no protection for geological sites unless they are on the National Heritage List (which does not include anything in the Harmans Valley area) or are within a National or State Park. Fortunately, Mt Napier, many of the Byaduk Caves and other features are within the Mt Napier State Park. However, in other areas, for example on private land, protection is only possible by indirect means – that is, if the geological sites also happen to have other values that are covered by environmental, planning or aboriginal heritage legislation.

In the early 2000s, interpretive signs, with information provided by Ken Grimes, were installed at the Harmans Valley Lookout and the site became a local tourist attraction.

At the time of the crushing work in mid-2004, many geologists, including Ken Grimes (Grimes, 2004), pushed for protection of significant geological features located on private land. Amid widespread local concerns about the rock crushing, which had already obliterated 15 hectares of the flow, the landowner agreed to halt work pending consideration of the issue by Southern Grampians Shire Council. The Council proposed seeking an Environmental Significance Overlay (ESO) under the Victorian *Planning and Environment Act 1987* for all areas of the flow on private land within the shire. In October 2004, the (then) Victorian Department of Sustainability and the Environment (DSE) drew up a map of the proposed ESO over the area of the flow based on information provided by Ken. Unfortunately, the ESO was never gazetted.

From my reading of Ken's archived emails, in early to mid-2005, DSE appeared to have been more focussed on negotiating with the landowner to "offset" the damage caused to native vegetation during the rock crushing by undertaking plantings elsewhere on his property. This, in effect, was recognising there was no basis for taking action for the destruction of geological features. Of course, from a geological perspective, the potential planting up other areas of the flow raised concerns about obscuring the geology and landscape features. It is not clear whether any agreement was reached with the landowner and there

is no on-the-ground evidence of any planting ever taking place.

In 2012, the (then) Department of Planning and Community Development completed a landscape assessment study in southwestern Victoria (*The South West Landscape Assessment Study*) in partnership with shire councils in the region. The aim of the study was to identify and assess key landscapes and make recommendations regarding their protection and management. The Harmans Valley, as viewed from the Harmans Valley lookout was identified as being of state-level significance and proposed a Significant Landscape Overlay (SLO) for the area, noting rather poetically that:

> "The view (from the lookout) is contained within the sweeping curve of the valley, with Mount Napier visible in the background. While other parts of the surrounding landscape are visible, the view cone describes the extent of the view that is dominated by the lava flow.
>
> The open, cleared foreground and elevated position of the viewing location allows for excellent, uninterrupted views over the lava flow. There is a high contrast between the rough texture of the flow and the dark, scrubby bracken growing in its crevices, and the smooth, grassy slopes of the valley walls. The lava flow is a dramatic visual feature that twists across the middle ground. The central location of Mount Napier and the span of the landscape between it and the viewing location makes it easy to appreciate the distance that the river of lava travelled when the volcano was active. This is further highlighted by dark vegetation that frames the valley and directs the eye across the volcanic features".

Despite these fine words, there was no immediate action to implement an SLO, unfortunately.

The area visible from the lookout changed hands, and in November 2015, the new owner started to rework the area crushed in 2004. The works were soon halted after a stop-work order was issued by the Southern Grampians Council and the owner was asked to complete a Cultural Heritage Management Plan (CHMP) under the terms of the State *Aboriginal Heritage Act 2006*.

Early in 2016, the Victorian Government enacted the ***Aboriginal Heritage Amendment Act 2016*** which among other things, sought to clarify when a CHMP was required and also changed the nature of the CHMP from a guidance document to an approval one. The extent to which the landowner resolved the CHMP issues is not known, but in mid-2016 he re-commenced works. On 8 July 2016, another stop-work order was issued under the Act. As was the case in 2004, there was a negative reaction in the local media (Figure 9). In response the landowner noted there was no SLO over his land and that the real damage was done ten years earlier by someone else.

Figure 9: March 2018 view of Harmans Valley from the roadside lookout

At about the same time, a medical researcher travelling through the area visited the lookout with his grandson and was so appalled by the damage that he made representations to the Minister for Planning. The representations appear to have been successful as an interim SLO was gazetted to cover all parts of the flow that were on private land within the Southern Grampians Shire. This basically meant that there was a planning objective to maintain the landscape character and setting of the lava flow. While a permit was required to damage a stone wall or to build a new one, there was no requirement to obtain a permit for any earthworks! The SLO was gazetted on 26 October 2016 and has effect until 31 October 2018.

In 2017, the Southern Grampians Shire Council drafted a proposal for a permanent SLO in consultation with the Department of *Environment, Land, Water and Planning (*DELWP). In terms of the planning policy framework in Victoria, as set out in the *Planning and Environment Act 1987* (PEA), the shire council was the designated planning authority for the proposal. In October 2017, DELWP released a draft proposal for a permanent SLO for public comment and invited submissions to Council by 20 October 2017. Council received a total of 74 submissions, including one by ACKMA and two by individual members of ACKMA. Most of the submissions supported the SLO being made permanent.

DELWP established a planning panel to consider the submissions and in early March 2018, it convened a 2-day public hearing in Hamilton at which submitters were given the opportunity to speak. There were 18 presentations including by the Shire Council, representatives of the Gunditjmara people, academic institutions, community groups, landowners, the State Environment Department, geotourism organisations, ACKMA and the IUS Commission on Volcanic Caves. A wide range of views were expressed in the hearing and during a field inspection (Figure 10). The hearing and outside discussions took place in a constructive and productive manner and a range of amendments proposed to the draft SLO addressed some of the concerns of landowners, most of whom did not support the SLO being made permanent, as well as those of the organisations seeking permanent protection of the flow who wanted specific restrictions on undertaking earthworks.

Figure 10: Field inspection of a rock crushed area during the public hearing

Perhaps the most significant amendment, which addressed a major concern of landowners, was to change the boundaries of the proposed SLO from a cadastral basis to the actual margins of the flow, plus a narrow (50 metre) buffer zone. The buffer zone was intended to cover potential errors in defining the margins of the flow as well as protecting the landscape setting of the flow in its valley. A buffer zone of 100 metres would have more adequately protected the landscape setting but there was little support for it. Changing the basis for defining the boundaries of the flow had the effect of removing some large parcels of land which had only very small sections of flow. It was also agreed there was little reason to include areas where the surface of the flow was completely covered with soil or wetland areas.

On the other hand, organisations seeking to protect the flow pushed hard for 'works' to specifically include rock crushing, quarrying and rock removal. A number of presenters at the public hearing considered the definition of works in the PEA was too vague.

Under the PEA, the planning panel has a limited amount of time to evaluate submissions and other evidence presented at the public hearing and submits its report to the responsible planning authority, as defined in the Act. On 16 April, the panel submitted its report to Council.

Current Situation

As the designated planning authority for this issue, the Southern Grampians Shire Council is currently considering the planning panel's report. Council will decide whether or not to accept the panel's recommendations. Assuming the planning panel recommends a permanent SLO over the Harmans Valley lava flow, council can accept or, should it so desire, reject or amend it. It must then inform the Planning Minister of its decision in writing. If council agrees to an SLO, it will become into effect after notice is published in the government Gazette. Should Council decide to reject or amend the SLO, the Minister has the power to intervene.

If the SLO is gazetted, it does not automatically guarantee protection of the Harmans Valley lava flow. The SLO is likely to contain a requirement for landowners to obtain a permit to undertake any 'works'. However, will permits always be sought and what might happen to the flow if a permit is granted?

Conclusion

The vista of Harmans Valley lava flow as viewed from the Hamilton Port Fairy Road has changed significantly since I first saw it in 1975. Farm management tracks have been pushed across the rocky surface of the flow, vegetation has been killed off or removed and a 20 hectare area has been

crunched, smoothed and sown with pasture grasses. In addition, the growth of trees in softwood plantations has obscured the lower slopes of Mt Napier. The result is that the landscape values of the area have been significantly diminished and its value as an education and research tool may have been lessened. Nevertheless, the flow remains the best preserved, dramatic and most readily observable flow in Australia. The flow also remains very important for aboriginal and early European cultural heritage reasons.

In view of these values, I am optimistic the flow will receive permanent protection under the Victorian Planning and Environment Act. However, I remain a little pessimistic of the Council's ability and willingness to ensure strict compliance with the intent of the proposed permanent Significant Landscape Overlay for the Harmans Valley lava flow.

Acknowledgements

It is unlikely that I would have become involved in the Harmans Valley issue at all without Ian Lewis drawing ACKMA's attention – and mine – to recent developments with Harmans Valley in October 2017. For this I am grateful.

I would especially like to thank Janeen Samuel for giving me access to Ken Grimes' emails, maps and papers on the Harmans Valley issue. Ken was working on the issue right up to the time of his sudden and tragic death in August 2016 and I wish to acknowledge Ken's long term commitment to raising public awareness of the importance of the Harmans Valley area and in documenting and seeking to protect its geological and cultural features as well as its landscape values.

I also acknowledge Emeritus Professors Ray Cas and Bernie Joyce in expanding my understanding of the Harmans Valley flow and the Newer Volcanic Province, through access to papers and stimulating discussions at Hamilton in March 2018.

Footnote

On 14 June 2018, the Southern Grampians Shire Council adopted the main recommendations of the Planning Panel Report. This is a significant step forward in protecting the Harmans Valley lava flow within the Shire and will take effect after Gazettal by the Victorian Government.

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