

Post Firestorm Keyline Design

Enlivening Nature and Human Nature

**Water Harvesting
Stopping Soil Erosion
Restoring Creek Systems
New Top Soil Generating
Local-Lateral Mutual-help Community Wellness**

Dr Les Spencer & Jamie Spencer
Total Care Foundation Inc.

Ken Yeomans
Keyline Design

May 2009

Revised Jan 2020



The Authors

Dr Les Spencer, the principal author researched Keyline and its adaptation to the social sphere for his PHD completed in 2005. He continues in post doctoral research. He along with Jamie Spencer and Ken Yeomans are the people who prepared the Heritage Application for Yobarnie, the property at North Richmond NSW where PA Yeomans evolved Keyline Agricultural practice - referred to later in this document.

Following the 2009 Kinglake firestorm the authors prepared a Demonstration Keyline Design for restoring a fire ravaged property owned by Toni-Ann Collins' in Ninks Road, St Andrews, Victoria. Ninks Road runs off the St Andrews Kinglake Road below where people in eight cars lost their lives. Twenty-Seven people lost their lives along Bald Spur Road that runs along the top of the Demonstration Property. This design was requested by Nillumbik Council and WACMAC, the Landcare collective around Whittlesea.. This property was completely burnt out and in the following few weeks had major erosion and soil loss problems. The Keyline Design is attached. The design would create a water harvesting capacity of 52 megalitres on the property. The property is in two parts with a joining easement. The small section is along Ninks Road. The larger section is where the dam systems may be extended.

No funding was provided by the authorities for evolving or implementing this Design Plan.



The photo above shows an existing dam completely filled with carbon and ash with eroded outflow. This dam would form the top end of the proposed new Dam number One (13 megalitres)

The next photo shows the same dam from below.



The following photos show some of the erosion following the fires that would be restored by the proposed Keyline design (forming part of the new Dam Three).









Bald Spur Road showing the ridge top on the high end of the proposed demonstration property



The above photo shows where the 4 megalitre ridge top dam would be situated adjacent Bald Spur Road as a community resource in times of fire, as well as providing very high-pressure water, that can service the demonstration property, and neighbouring properties, if necessary. The following photo is from the ridge looking down across the sloping grassed area to the round hill on the demonstration property evidencing the high-pressure potential of the top dam.



Photo – From the Bald Spur Ridge looking down towards the round hill

KEYLINE FOUNDATION INCORPORATED

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Keyline Foundation

The founding members of the Foundation are president Ken Yeomans, son of PA Yeomans, Professor Stuart Hill, ecologist from University of Western Sydney, Dr Les Spencer who researched Keyline for his PhD, and his son Jamie Spencer who implements Keyline projects. The Foundation would be pleased to work in assisting fire researchers with any proposal to use Keyline as a means of providing abundant water in the landscape as a means of combating future fires as well as processes for reconstituting top soils.

Keyline Fire and Drought Proofing Project

Prepared by Keyline Foundation Inc.
May 2009 – Revised Jan 2020

Hand Up Brief

The Keyline Fire and Drought Proofing Project is a Demonstration Project following the 2009 Victorian Black Saturday Firestorm. The Project evolved from discussions between Toni-Ann Collins - a landholder from Ninks Road, St Andrews, WACMAC Landcare Inc., Nillumbik Council, and the Keyline Foundation Inc. Toni-Ann's house, outbuildings and fences were destroyed in the Black Saturday fires. Ninks Road runs off the St Andrews Kinglake Road below where people in eight cars lost their lives. Twenty-Seven people lost their lives along Bald Spur Road that runs along the top of the Demonstration Property.

This Project can be a model for enabling environments both in Victoria and the wider world. For example, the UK based Community of Communities organization (refer attachment) is closely following the work of the Keyline Foundation in the Fire Affected Regions as are people from disaster response networks through East Asia.

The Project's aim is to create and sustain an agricultural environment where local fire affected people, (including school children and adolescents) and others can come and see firsthand processes that work well; processes that they may want to replicate on their own properties.

The design would create a water harvesting capacity of 52 megalitres on the property. The farm currently has three dams with a holding capacity of around 3 megalitres. One of these dams is dry and full of carbon-based mud. The others hold water though also contain carbon-based mud.

The proposed demonstration project includes:

- The strategic repair, design, layout and linking of water storage dams and ponds and the water's use for stock, Permaculture gardens, household and fire prevention and firefighting
- Keyline designed rip-ploughing processes for in-ground water storage/flow-through and increasing soil health and vitality
- Carbon Farming - large scale sequestering of atmospheric carbon dioxide in soils
- Strategic use of charcoal and ash left by the fire to enhance soil health
- Other natural soil enrichment processes
- Fire suppression and elimination processes
- Guided tours for visitors; visitor briefing, workshops and seminars
- Documenting and write up of the Project development and rollout
- Development of Educational material (for example, a relationship may be evolved firstly with Eltham College which runs Permaculture as a subject through the secondary level, and secondly with NMIT Agricultural Science section
- Developing a Visitor Resource Centre

The Project Designer is Ken Yeomans of Keyline Designs Pty Ltd. Ken, is the past President of the Keyline Foundation, and son of the founder of Keyline, P.A. Yeomans. Ken has written a book that updates Keyline.

The Works Manager and Project Coordinator is Jamie Spencer of Terra Preta Pty Ltd. Jamie has been mentored by PA Yeomans' sons Ken and Neville. Jamie has also contributed to the Keyline property survey, briefed Ken Yeomans, and helped in the preparation of the Project Hand-up Brief and Proposal and associated costing.

The Project Documentation and Resources Developer is Dr Les Spencer, whose PhD Research was on the Yeomans Families contributions to the natural and social sciences. Les helped carry out the property Keyline survey work, and the briefing of Ken Yeomans, contributed to the writing of the Project Handup Brief and Proposal, and will carry out Project documenting and visitor resource and educational material writing.

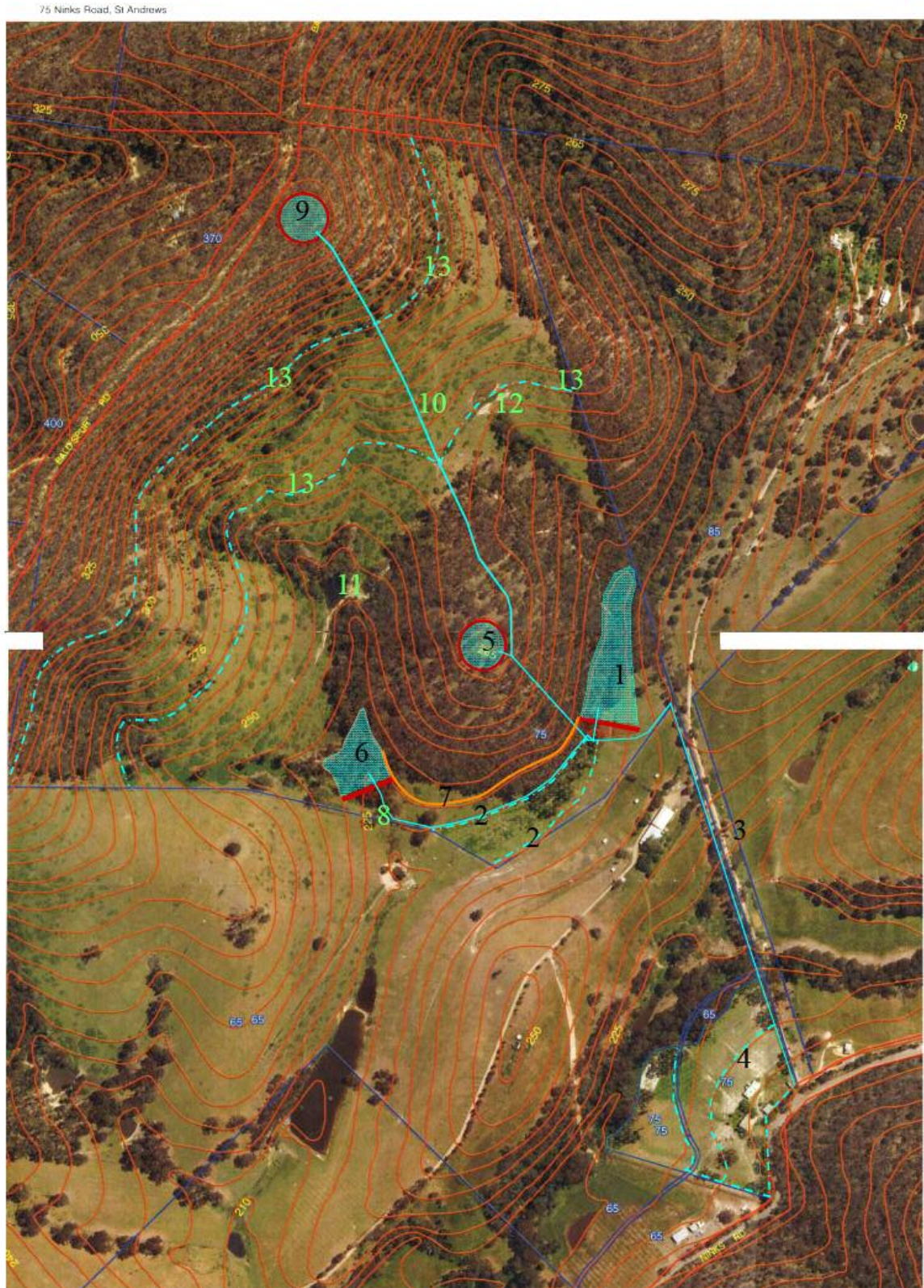
The Project Architect is Gregory Burgess. Gregory and Keyline Foundation members have maintained a dialogue over the past twenty five years especially relating to creating wellbeing environments fitting well into local topography. Gregory has been awarded the RAIA Gold Medal – the Career Award for the Premier Architect – the highest award given in Architecture in Australia



Branbuk Cultural Centre Halls Gap designed by G. Burgess

There may be scope for additional funding for Greg Burgess to design an economical and aesthetically beautiful educational and resource facility that sits over the water of the ring dam on top of the valley hill (refer No. 5 in the Legend). This facility would allow an overview of the Project works and the surrounding valley vistas. This could become a venue for bringing students and others including international visitors of all ages to showcase the Demonstration Project.

DESIGN



Legend and Potential Construction Staging of Project

1. Dam One can hold thirteen megalitres (13,000 tonnes). There is a pipe through the base of this dam wall (specially designed to prevent washout along the outside of the pipe).
2. The pale blue dotted line on the top and bottom of the green hatched area is a contour line open channel that allows gravity wetting of the green-hatched area.
3. In the first stage of funding the water from Dam One can be pumped to supply water to the Ninks road section of the property for household use, Permaculture gardening, fire fighting and gravity wetting of green hatched area, which will be Keylined plowed and nutrient enriched before watering. Once Stage 5 is in place; the hill top dam water can be gravity fed up to the Ninks Road Section of the property.
4. The light blue dotted lines in the green hatched are three open contour channels for gravity wetting of the green hatched area, which will be Keylined plowed and nutrient enriched before watering.
5. Dam Two is a four megalitre hilltop ring dam; water pumped from Dam One to fill this hilltop dam. Before the hilltop dam is filled, poles may be embedded for constructing the Keyline Demonstration Visitors Centre above the dam creating a 'reflection pool' effect. The hilltop affords magnificent views of the surrounding Project and countryside. Dam Two can wet the entire hillside with water recovered in the dams at the base of the hill again.
6. Dam Three can hold nine megalitres; a badly eroded gully will be repaired and enhanced in the process.
7. The orange line is an open contour channel to top up Dam Three from Dam One.
8. The light blue contour channel can wet green-hatched area.
9. This Dam is a four megalitre ring-top dam situated 105 metres above the top of the hilltop dam creating very high pressure for water distribution on the higher slopes and pasture (pasture will be Keylined plowed and nutrient enriched before watering; this water pressure can be used to explore water-mist fire suppression technology.
10. The Pump on Dam Two takes water up to the highest Dam (numbered 9).
11. The fifth Dam (numbered 11) is an existing 1.3 megalitre dam which will be cleaned and strengthened; carbon and ash sediment will be extracted, dried, and placed into soils by Keyline Plow.
12. The sixth Dam (numbered 12) is an existing 9 megalitre dam that will be cleaned and strengthened; with carbon and ash sediment extracted, dried and placed into soils by Keyline Plow; an open contour channel will allow wetting of the pasture to the right and lower after Keyline plowing and nutrient enriched before watering
13. These are open contour channels on the hillside for distributing water with takeoff points to fill the two existing dams
14. Carbon and ash accumulations on the property will be harvested and used to enrich the property soils via direct injecting them by Keyline plow during the above plowing
15. A number of eroded gullies on the property would be restored and future erosion controlled through Keyline ploughing and other soil and water retention processes



The above photo shows the easement that joins the two parts of Toni-Ann's property. The main Kinglake – St Andrews road, where people in eight cars lost their lives, can be seen as a line on the ridge to the right of the shadow of the photographer.

REDBANK CREEK, KEYLINE AND FIRE AFFECTED AREAS

Dr Les Spencer and Jamie Spencer
Total Care Foundation Inc.
May 2009

The following notes and photos has links to the previous Kinglake fires material and relate to the water outflow from the Yobarnie property to Redbank Creek in North Richmond NSW. The photos were taken during Feb 2009 by Les and Jamie Spencer during their visit to North Richmond with Ken Yeomans and Professor Stuart Hill to attend meetings with the North Richmond Community to preserve the Yeomans' farms.

The photographs show where erosion and flooding is *already* a significant problem. Erosion and flooding *would be considerably exacerbated by the increased quantity and speed of water run-off that would inevitably result from removing any of the Yobarnie dams and asphaltting over the top of very water-absorbent soils.*

The following aerial photo shows the outflow from the dam on the bottom left (the first dam the developer wants to remove) running parallel (and below) Granger Place towards Tyne Crescent. All of the water entering this very large dam (around 80 megalitres) fills from the dam's catchment area on the lower part of the Yobarnie property. If this dam is removed, all that run-off will travel down the run-off system described below. Water runs off the Yobarnie property to a small holding pond (shown as 7 on the second aerial map below – refer photo 1a and 1b below). From this pond, water is diverted in two ways – one way to a pipe running under houses on the right-hand side of Tyne Crescent. This pipe empties into an open grassed channel running along the back of the houses on the lower side of Campbell Street and around a bend, then angling under blocks of flats into two pipes at the end of the clearing. The second way water is diverted from the holding pond near Grainger Place is through a pipe that runs under the green open space running up past Pecks road (the electricity easement).



The two outflow courses are marked in purple on the photo below. The following photo series are also marked



Photo 1a – The small holding pond with entrance to pipe running underground up the electricity easement past Pecks Road to Redbank Creek

This storm water pipeline along the electricity easement crosses a ridge. There can be very little fall in this pipeline so even when full, its capacity would not be very great due to the lack of grade or fall along the pipeline.

The contours on the photo below show this fact.



If one copies this photo and enlarges it you can see the yellow contour line. There are two more white contour lines that loop through the easement. That means, for the water to flow along the pipeline it must be at least 2, if not 3 meters deep, at the top of the ridge. Further, Baylis Place drains towards the easement and presumably into this pipeline - but Baylis Place is nearly 2 metres higher than the pipeline along the easement entailing presumably a 2 to 3 metre drop into the pipe.



Photo 1b. The pond area near where the outflow goes under housing in Tyne Crescent

Local residents said that this pond area has experienced flooding. The outflow pipe runs under housing into an open channel running through a grassed corridor with housing on both sides shown in next four photos number 2 to 5.



Photo 2. Channel running downhill to the right



Photo 3. Water running down towards bottom of the photo



Photo 4. Water running towards bottom of the photo



Photo 5. Water running towards the back of Les and Max, a local resident

Children play along the open channel shown in photos 2 to 5. It does flood on the way to entering Redbank Creek.

The photo below shows where the open channel flows under a car park of a two-story block of flats.



Photo 6

The two drainage pipes are supposed to take away all of the open channel water under the car park. This double-story block of flats was allowed to be built right in the floodway. When the channel floods, the water flows over the top of the pipes and floods the car park. For the frequency of large volumes of water, these pipes are grossly inadequate. Their placement just below the car park level is poorly conceived.

The photo below shows how that pipe under the easement runs up past Pecks Road to Redbank Creek.





The purple line shows the underground pipe. The location of photos 8 and 9 are also shown.

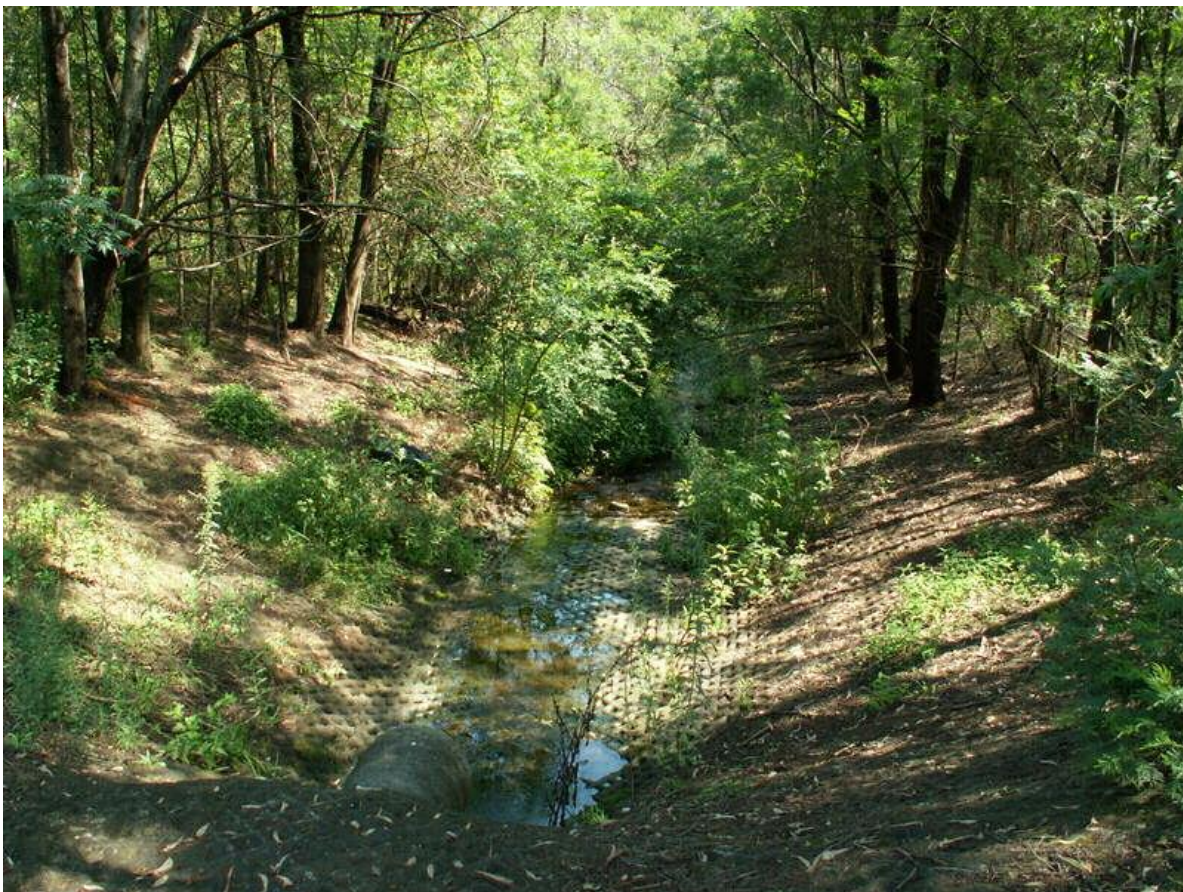


Photo 8 - Near where channel enters Redbank Creek

Below is the rear of a house (its position is shown on the above aerial shot by the number 9) where the property owner has lost most of his backyard by its collapsing into Redbank Creek. This has been caused by bank erosion on a tight bend in the creek. The owner told Les and Jamie Spencer that despite repeated requests over a number of years, no action has been taken to address the increasing collapse by any of the relevant authorities.



Photo 9a - House on Redbank Creek
Half of its backyard has collapsed into the creek

Note the large crack just down from the fence. The photo below shows dense bush along the creek where yard has collapsed – a potential fire hazard.



Photo 9b

The Photo below is of the same backyard with next stage of collapse ready to happen.



Photo 9c



Photo 9d



Photo 9e

While the storm water run-off processes and Redbank Creek are not on the Yobarnie property - the subject of the Urgent Heritage Request – the linked dams of the Yobarnie property are a fundamental aspect (along with the very absorbent soil created by the Keyline processes) playing a substantial roll in storm water run-off and flood control. The above evidences that the area below Yobarnie is an area already under stress in coping when the dams are in place and the soils open to absorb (rather than covered in asphalt).

The current water runoff provisions below Yobarnie are inadequate and the likelihood of flooding and erosion will increase substantially if the water flow control function of the Yobarnie dam system and soil water absorption capacity on Yobarnie is lost.

Locals stated that water people had said (off the record) that the water control in the immediate area was a major concern that was larger than the available will and resources could address.

KEYLINE DESIGN FOR MOUNTAIN FOREST To do

LETTERS OF SUPPORT



Emeritus Professor Stuart Hill
Foundation Chair of Social Ecology –
University of Western Sydney

Enabling Environments Post Firestorm

I write and offer support for the **Enabling Environments Post Firestorm Program**, green habitat, drought-proofing, environmental remediation, and deep social ecology methods supporting return to wellness in firestorm affected Environments and Communities.

The above action draws upon ecological and social ecological pioneers in extending understandings of fast-tracking what takes nature 1000s of years to achieve.

I have worked closely with the Enabling Environments Post Firestorm Program Developers over the past 20 years. I highly commend their work.

Emeritus Professor Stuart Hill



Further information:
www.enablingenvironments.com
www.communityofcommunities.org.uk
www.growingbetterlives.org



Dr Les Spencer
76 Banyule Road
Rosanna, 3084
AUSTRALIA.

Enabling Environments Post Firestorm

I would like to write and offer our support for Doctor Les Spencer's Enabling Environments methods supporting return to wellbeing in stressed communities and environments following recent fire devastation in Australia. We followed closely Dr. Spencer and his colleagues in their Enabling Environments Design Work linked to the 2009 Kinglake fires.

As a result of twelve years work in Enabling Environments in the UK and overseas (including Australasia), we have found that the best definition of the work is by identifying the values upon which it is based.

We would be very interested in the extent to which our 'values-based standards' could be used as a benchmark of rigour and quality in this proposed **Enabling Environments Post Firestorm Program**.

We are also developing a quality award for 'emotionally intelligent' psychosocial environments (the "Enabling Environments Award") and would be keen to pilot its use in these settings.

In the event that this collaboration is not practicable or possible, we would wish the Being Well Proposals the very best of good fortune in helping to transform lives and environments in Australia.

Professor Rex Haigh MA (Cantab) BM BCh (Oxon) FRCPsych
Memb Inst GA
Honorary Professor of Therapeutic Environments and Relational Health in Nottingham University's School of Sociology and Social Policy
Consultant Psychiatrist, Berkshire Healthcare NHS Foundation Trust
Project Lead, Positive Environments, Royal College of Psychiatrists
Chair, Growing Better Lives, Community Interest Company
Senior Fellow, Institute of Mental Health, Nottingham University

Letter from David Holmgren – Cofounder of Permaculture

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The source of Permaculture vision and innovation

Statement of Support

The properties known as Yobarnie and Nevallan at North Richmond represent heritage sites of local, national and international heritage significance. Despite years of neglect, the Keyline systems implemented by P.A. Yeomans in the 1950's and 1960's are still largely intact and functional.

In the research work that I did with Bill Mollison in the 1970's developing the Permaculture concept, we identified the Keyline system of landscape analysis, soil development and water harvesting developed by P.A. Yeomans as the only example (in the world) of modern functional landscape design that provided a precursor to Permaculture as ecologically functional landscape design. The teaching of Keyline within Permaculture Design Courses has spread the awareness and application of Keyline around the world over the last 25 years beyond that achieved by the extensive documentation in books, film and other media by Yeomans in the 1950's and 60's. The North Richmond properties featured strongly in all of that teaching and documentation and as a consequence have iconic status that should be celebrated as national landscape treasures. While awareness of the importance of these heritage sites within the local and general community might not be great, within the global networks of ecological sustainable land and water use, these properties are icons of international importance. They should immediately be given the highest protection as national heritage sites because this is where P.A. Yeomans actually developed the Keyline system.

Any development on these sites should conserve, maintain and utilize the Keyline water harvesting and management system as a basis for any settlement pattern. Any development that destroyed the Keyline system would be vandalism that would reflect badly on the N.S.W. planning system and more generally on Australians' understanding and respect for the greatest work of one of our ecological pioneers.

A handwritten signature in blue ink that reads "David Holmgren". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

David Holmgren, Co-originator of the Permaculture concept

3rd, March 2009

Themes to write

- Bird droppers
- Clay balls
- Microcubes seeds spore keybound in clay surrounded with colloid - stays wet long time valley kicklines left and right
- insects
- best places keypoint
- Levacian collection of multiples Levicia total multiples
- high mountain storage ponds for Inoculant
- embankment stockpile incubator
- beginning the creek line
- tea bag stays leaching life force
- Stays near to floats
- Camera in trees feeding back similar to john's Malaysian security