great rail experiences australia

Association of Tourist & Heritage Rail Australia Inc
ABN 19 755 744868

2/11/18

Ms Natasha Exel
Inquiry Secretary
Legislative Council
Parliament House
HOBART TAS 7000

Forwarded by email to ner@parliament.tas.gov.au

Dear Members of the Legislative Council Committee,

Inquiry into the North-east Rail Corridor

Since 2016 I have been lobbying for keeping the North East Railway Line for the higher value tourist rail use.

This lobbying has included attendance at numerous public, council, government and study meetings, including addressing the Legislative Council on the issues associated with the Strategic Infrastructure Corridors Bill. I have, since the commencement of the project, mentored the LNER team as an external advisor on how best to put their case for the establishing a tourist rail opportunity.

I have an overarching interest and passion for seeing our operational heritage kept alive where it is sustainable to do so and I believe I have some expertise in determining when there is a good community outcome to pursue preservation, along with a track record of engaging our community to take up the cause and deliver successful outcomes.

By way of background:

- I am a registered professional engineer running my own civil and structural engineering firm since 2006. I graduated in 1992 with honours and completed an MBA in 2006
- Chairman of the Association of Tourist and Heritage Rail (ATHRA) since 2013 representing the 73 accredited railways and many museum groups across Australia
- Chairman of the Tasmanian Association of Tourist Railways which was founded in 1996 for all bar 7 years.
- Winner of Engineers Australia prestigious Monash Medal for my contribution to engineering heritage preservation. This award was primarily due to my role as a lead community activist leading the community in a campaign against Hydro Tasmania's plans to decommission the Historic Lake Margaret Power Station and to build a new $20million single automated machine. As you are aware this campaign was highly successful changing the Hydros direction to refurbishing the heritage equipment and re-opening the lower power station.

- Chairman of the highly successful Redwater Creek Steam and Heritage Society Inc which runs SteamFest Tasmania for all bar 4 years of the last 25 years.
- Community activist for the preservation of the Forth River Swing Bridge which was destined to be decommissioned and destroyed when Tasrail completed the new rail bridge alongside. Plans are afoot now to convert this bridge into an essential part of the North West Coastal Pathway which celebrates our heritage. The preservation of this bridge has allowed the most expensive link of the coastal pathway to be constructed at relatively low cost.
- As a professional engineer I have undertaken rail and road bridge design proof checks across the country, completed design and delivery of over 50 subdivisions and undertaken reviews of standards for the Rail Industry Safety and Standards Board – specifically – AS 7643 Track Lateral Stability and for AS 7633 Clearances – Infrastructure

With regard to this inquiry I provide the following information.

The Feasibility of the Scottsdale-Lilydale Falls Rail Trail

The cornerstone for the development of the rail trail has been the Dorset Councils successful submission to the National Stronger Regions Fund for $1.47mill to construct the rail trail. A copy of the North East Rail Trail Preliminary Demand and Economic Benefit Assessment can be supplied if you don't already have it.

It is interesting that this grant was obtained from the National Stronger Regions Fund which gave the following assessment criteria :-

Applications will be appraised against each of the following assessment criteria:

- Assessment Criterion 1: The extent to which the project contributes to economic growth in the region;
- Assessment Criterion 2: The extent to which the project supports or addresses disadvantage in the region;
- Assessment Criterion 3: The extent to which the project increases investment and builds partnerships in the region; and
- Assessment Criterion 4: The extent to which the project and proponent are viable and sustainable.

I would argue that the Launceston and North East Railway project would out compete the rail trail project on all counts with an objective assessment.

The project which obtained NSRF Funding was construction of the rail trail from Scottsdale to Launceston.

Soon after it was found that the Tasrail corridor from Coldwater Creek to Launceston was out of bounds for bike track developments.

It seemed then that the bike path length diminished to Turners Marsh to Scottsdale.

The SIC bill campaign delayed the project significantly and the recent State Government determination has trimmed it further to Lilydale Falls to Scottsdale.

In my long history of grant submissions, I find it interesting that a grant scope can be cut so dramatically and still remain as a valid grant submission.

It is understood that the grant requires works to be completed by 2019 and that the Strategic Infrastructure Corridor Act requires that a bike trail constructed on a corridor which has a permitted rail use will need to obtain Council Planning Approval.

As it stands the development crosses two councils in the current Lilydale Falls to Scottsdale Format. Planning approval will not be easily obtained knowing that most of the neighbours to the corridor are against the bike track proposal. The realistic time frame for this process to run through the expected appeals process is 6 months.

I understand that the corridor has not been declared a strategic infrastructure corridor yet and that the planning process cannot commence until this has occurred. Will timing on the grant preclude it from progressing?

A pre-requisite of the grant was that it demonstrated $ for $ matching funding for the $1.47mill. The source of this funding has not been budgeted by Dorset Council or State Government to my knowledge. During the SIC bill lobbying evidence was supplied demonstrating that the scap might just pay for the demolition of the line and its haulage to the scrap yards. This option was promoted before the SIC bill gave first right of refusal to rail groups to obtain the rail and sleepers for rail purposes.

The construction and maintenance costs quoted seem significantly lower than recommended construction and maintenance costs coming from bodies with expertise in these fields.

The recent announcement by the Launceston Council – who have the line to Wyena within their municipal boundary, is highly supported. Their announcement, that they prefer the rail experience to Wyena and that they support additional funds being obtained for the bike track to be constructed separate to the operational railway, demonstrates that it is not just the residents along the line, the history buffs, and the rail preservationists but also local government who are starting to see the positive future for tourist rail activities in the north east.

Lastly how does the viability of a bike track which charges nothing for users to ride it, which is funded by local and state government, compare to a railway which, if successful will fund its own way, its own marketing, its own staff and its own maintenance.

The Feasibility of the proposed Lilydale to Turners Marsh Railway

Firstly let me say that the above heading – taken from the Governments proposed win/win solution of giving part of the railway to everyone demonstrates completely the lack of understanding for what makes railways and destinational marketing work. The point I am referring to is that A serious attempt at making the railway feasible over this shorter section would have to include the Lilydale Falls – particularly since it would not involve competition for the corridor given the bike track is to terminate at Lilydale Falls due to the valid concerns of farmers adjoining the corridor.

I know the inquiry will be given copies of Bob Vanselows summary track assessment and Eamonn Seddons (On Track) input to a business plan along with the Linquage assessment. All of these assessments point positively to the low cost to return the line to railcar service and the second two point to the scenic beauty of the Denison Gorge and the tourism draw card of operation through the tunnel. As an engineer I have been asked to submit Bobs working documents and CV and I include them in **Attachment A.**

Bob's documents include:-

- CV For Bob Vanselow Rail Engineer
- Summary report of Bridges through to Scottsdale
- Detail Report of Track and infrastructure through to Scottsdale
- Spreadsheet showing Errors in Raylinks Reports leading to a $257,900 over estimate of bridge repairs – actual cost based on Raylink Data with errors fixed $393,800. This is not overly meaningful as the Raylink figures bear little resemblance to what can be achieved with the volunteer and community input other than to show issues in this report.
- Draft report of Lilydale to Wyena rail infrastructure assessment

Without access to the mainline the most attractive section for tourist rail operations is Lilydale to Wyena encompassing the above features.

From an engineering perspective the line has 30% steel sleepers throughout and it was being upgraded through to 2005 for ongoing freight traffic. The predominant installation of the lower maintenance steel sleepers had been in the steeper country where continuous curves put greater stress on the track. The straight sections received a scattering of steel. The highest concentration of straight (there aren't that many) is from Lilydale to Turners Marsh. Much of the line above Lilydale falls would run trains today with limited repair work required to make the track operational.

I strongly contest that much of the Raylink Report estimates are over the top for the level of operation and risk proposed. Assertions in his report that all fishplates should be dismantled and greased and that the tunnel requires drainage and level crossings must be ripped up are all excessive for risk management in this scenario. These views were also held by Bob Vanselow and Chris LeMarshall who wrote the Government Funded Linquage report.

Level crossing costs are also grossly exaggerated. Tasrail could re-install the level crossing lights or alternative technologies can be promoted for significantly reduced costs.

I have the firm belief that under the correct management structure that the Launceston and North East Railway can be turned into a viable tourist attraction with patronage easily exceeding the conservative estimates provided in the On Track Report. The On Track Report makes recommendations for the proposed management structure. This report has been accepted by the current LNER Board for future adoption once there is a mandate for the railway to proceed.

With regard to the main question – the line from Turners Marsh to Lilydale **Falls** will provide a scenic and attractive tourist attraction which may, in time, with Tasrail permission, grow to encompass services into Launceston. Feasibility of the line would increase significantly if the Denison Gorge were taken on as a destination along with the opportunity to link bus returns at Wyena. For example busses could take people out of Launceston – stop in on some of the attractions that are remote from the railway line – like the Lavender Farm – then drop the bus people to Wyena picking up the train people to undertake the return journey via bus. The difference in attraction/experience goes from average to something which has exceptional opportunity for preserving Tasmania's rail history in a sustainable format.

If it is agreed that Wyena become the rail end destination – as promoted by Launceston Council, I implore those in a position to influence the outcome to consider a stay of execution on the Wyena to Scottsdale section for a reasonable period to determine whether the last leg can be re-opened in a format that provides a viable tourist attraction.

The Rail Track Riders type operation is an obvious short term concept which can provide a positive return to the community without the need to remove the line. This concept works well at Maydeena and National Park and in many locations in New Zealand.

The growth of the bus return market is the most likely means of making a longer day rail trip from Launceston to Scottsdale work as a packaged experience.

One thought I feel quite qualified to express is that a passionate community can achieve some spectacular outcomes – outcomes which are often not understood by people whose predominant experience is that of the achievement of business and paid staff. What I have seen of the North East community is a community desperate to hold onto their heritage. This heritage was built by their forebears, it carried their forefathers off to school, to shopping, to the first and second world wars, to visit their families and to go on honey moons. The Railway connected the North East community to the outside world. Now the community wants to connect its railway back to the outside world.

The Big Picture

The project of developing community and infrastructure projects such as these takes a leap of faith as you can't plan with conventional processes for all the outcomes, all the possibilities, all the support in grants, work for the dole and from the community. All you can do is believe in the team and the concept, let the train start the journey and see where it takes you.

On the broader value proposition the development of strong communities around railways can lead to many other significant benefits.

Should LNER gain a good foothold into the tourism market and then get mainline accreditation who knows where their efforts may precipitate benefits to the state.

Firstly a well thought out passenger rail product running directly out of Launceston will significantly enhance bed nights in Launceston.

If I dare to think big, the rail product could then expand to the capacity to run all manner of combination products in and around Launceston eg:-

- Train and boat to Georgetown – swap over there to return via an alternative mode of transport
- Trips to Deloraine during the craft festival
- Trips to Quercus park during AGFEST
- Fly in and train trips around the state – picked up from Western Junction
- Launceston to Relbia wine trains

Thinking one step bigger – that all the mainline operators run under the one insurance policy and the one accreditation – employing staff to do the work that volunteers don't excel at, Tasmania could really capitalize on its under utilized infrastructure and provide a relaxed friendly product offering. Strangely, if you look back at our heritage, the Tasmanian Government Railways (TGR) were the starting point for Tourism Tasmania. How rapidly we have turned our backs on the benefits of rail tourism and the source of our early establishment in tourism!

With a co-ordinated approach across the state other key products could include:-

- Suburban rail in Hobart connecting Bridgewater to Hobart CBD with heritage tram cars travelling into the city feeding the main station at Macquarie Point
- Fine cuisine and blues train style themed trains could pick the eyes out of event markets or if patronage permits – run a regular Friday and Saturday nights – in say Hobart or from Devonport to Burnie where the coastal rail side scenery is second to none.

Similar products are successful in Victoria – the Q Train, The Blues Train on the Bellarine Peninsular, Dining trains on the Puffing Billy Railway etc. A quick google will pull up these great rail experiences.

Victoria presently carries just under one million passengers a year on their heritage rail experiences – this is in a state where suburban rail is widespread. The heritage rail experiences are what they seek.

Full capitalisation of Tasmania's rail experiences won't happen with the current leadership abilities in the sector but could be brought to fruition with a co-ordinated and supported team potentially established in a state wide board.

I enclose a copy of a recent media release for your reference as **Attachment B** which was released following the Treasury comparison report and acceptance of rail to Lilydale.

Conclusion

The dilemmas facing good public policy choices over heritage rail futures are all on sight here. On the one hand new development opportunities appear attractive to governments and present immediate returns to struggling regions. But in doing so there tends to be a lack of strategic vision about the mix of factors that inevitably drive regional futures – increasingly these futures involve the smart integration of heritage values and heritage experience into a mix of tourism and related commercial value propositions. These value propositions do not lend themselves to the immediate demands for a ‘business case’ to compare ‘projects’ where inevitably small volunteer based organisations are expected to generate sophisticated economic modelling on the smell of an oily rag.

Since ultimately heritage rail is inevitably a mix of public and private goods there needs to be a more informed public policy discussion, not about particular projects but about the future of Tasmania and the role of the slumbering network of rail infrastructure that was once the backbone of the our economic and social connectivity. Not the role in the past though, but the potential role in the future as a central series of nodes connecting and being a part of the vast array of regional offerings that constitute our tourism future.

To get to such a point requires our heritage rail sector to come together as one policy voice and a group of us are now working together towards this end and we will be seeking support to achieve this. It also requires governments to pause in their rush to trash history on a line by line basis and step back to seriously consider the broader value proposition that continues to slip away.

If I or my associates such as Professor David Adams, Eamonn Seddon or Bob Vanselow can be of assistance at the enquiry please let me know and I will make the necessary arrangements.

Regards

Chris Martin BEng Civil, MBA (Tech Mgt)
Chairman – Association of Tourist & Heritage Rail Australia Inc
Chairman of the Sheffield Steam and Heritage Centre and SteamFest Committee

Tourist Website – www.greatrailexperiencesaustralia.com.au
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Epilogue

This afternoon as I put the finishing touches on this submission I received Tim Fischers latest excellent, high quality publication entitled *Steam Locomotives that Galvanised the Nation – Australia*, hot off the press. Its interesting that Australia's foremost enthusiast and authority named chapter 9 *Tasmanian Rail: A Saga of Lost Opportunity* and in the 16 pages dedicated to Tasmania, on page 197 and 198 he says:-

"All things considered, it is a reasonable observation that Tasmania has huge potential to run heritage gourmet tourist steam trains along its under-used main lines, to exploit the superb vistas afforded by locations such as the Western Tiers, to name just one. This potential is every bit as good as any on the mainland. The only question is, can Tasmania be bold enough to get its act together to make it happen?

He goes on to say

Still possibilities exist, including with reopening the magnificent Scottsdale line. The obvious nomenclature for the project is easy to find: Scottsdale lies north-east of Launceston, so "Launceston North Eastern Railway', or LNER, readily suggests itself. It could be a sister railway, a little 'down under' relation to that other famous LNER, the London and North Eastern Railway.

Certainly, rail heritage operations in Tasmania can match the pulling power of rail heritage drawcards in places like Wales, where the Ffestiniog and others are now world renowned and attract many international tourists. But it is reasonable to ask whether Tasmania has the boldness to make this happen, or whether it will lose all rail traffic over the next two decades."

ATTACHMENT A

Bob's documents include:-

- CV For Bob Vanselow Rail Engineer
- Summary report of Bridges through to Scottsdale
- Detail Report of Track and infrastructure through to Scottsdale
- Spreadsheet showing Errors in Raylinks Reports leading to a $257,900 over estimate of bridge repairs – actual cost based on Raylink Data with errors fixed $393,800. This is not overly meaningful as the Raylink figures bear little resemblance to what can be achieved with the volunteer and community input other than to show issues in this report.
- Draft report of Lilydale to Wyena rail infrastructure assessment

Curriculum Vitae

Robert Gordon *(Bob)* **Vanselow, BE (Civ), MIE Aust, CP Eng, CMILT, MPWI**
Manager / Railway Consulting Engineer, trading as “BobV Rail” (ABN 77 640 721 252; Sole Trader, GST-registered)

Home and Business Address:
33 Barton Street, West Wodonga, Vic. (3690)

Contact Details:
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Facsimile: (02) 6059 6983
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E-mail: bobvrail@bigpond.com

Qualifications:
Bachelor of Engineering (Civil), University of Melbourne, 1969 (Honours 2A)
Member, Institution of Engineers Australia
Chartered Professional Engineer (NPER: 226903)
Member, Railway Technical Society of Australasia
The Australian Administrative Staff College (Management Development Program 68)
Member, The Chartered Institute of Logistics and Transport in Australia
Fellow, The Permanent Way Institution (UK, 1993)
Member, The Permanent Way Institution (NSW Division, 2008)
Member, Rail Track Association Australia

Employment History since Graduating:

March – April 1970: Engineer, Taylor Woodrow International (Perth, WA). Multi-storey building construction in central city.
May – Dec 1970: Site Supervisor, Gavin Dewar & Co (Paraburdoo, WA). Construction of town water supply, sewerage reticulation system and sewage treatment works.
Jan 1971 – July 1972: Office Engineer, Morrison-Knudsen-Mannix-Oman (Tom Price & Wickham, WA). Construction of Tom Price to Paraburdoo and Robe River railways.
July – Dec 1972: Project Engineer, Thiess Brothers P/L (Townsville, Qld). Construction of Townsville to Greenvale Nickel railway.
March 1973 – July 1980: Planning Officer & Project Engineer – Civil, Melbourne & Metropolitan Tramways Board (Melb, Vic). Network planning, track reconstruction, reconfigurations and extensions to the street tramway network.
Aug 1980 – Nov 1984: Civil Engineer – Railway Technical, Hamersley Iron P/L (Seven Mile, Dampier, WA). R&D to improve heavy-haul railway track infrastructure and maintenance efficiencies.
Nov 1984 – Sept 1987: Manager – Railway Technical Dep’t, Hamersley Iron P/L (Seven Mile, Dampier, WA). R&D to improve heavy-haul railway track infrastructure, locomotives, rollingstock, operations and maintenance efficiencies.

Sept 1987 – June 2002: Specialist Engineer – Railway Projects, Hamersley Iron P/L (Seven Mile and Dampier, WA). Attached to Engineering (Dampier Op's), Track Signals & Communications (Rail), then Engineering (Dampier Op's). Various railway-related projects and investigations for HI/RioTinto's new business opportunities, growth and efficiencies.
July 2002 – Oct 2007: Specialist Project Engineer, assigned to Pilbara Rail Company P/L, then Pilbara Iron-Railways Division (Seven Mile, Dampier, WA). Various railway-related projects and investigations for Hamersley Iron/Pilbara Rail/Pilbara Iron/RioTinto's new business opportunities, growth and efficiencies. This work included overseas iron ore railway projects in Brazil (3) and Guinea (West Africa).

Snapshot of RGV's Active Projects for Pilbara Rail, at Dec 2005 - Jan '06

- *7 Mile Yard de-bottlenecking for 150 mta rate (incl. Bad Order Car removal options, and interfacing with proposed Drop Pit).*
- *Optimum ore-car set size (2, 4 or 6…post-closure of Parker Point dumper CD 1) and planned Bad Order 'Block Maintenance' size studies, for pooled fleet.*
- *Cape Lambert Yard upgrading for 80 mta (incl. provision for possible future 3rd Dumper to ~100 mta).*
- *Derailment Report for Cape Lambert (hand-throw trailable 1:10 turnouts).*
- *Dampier Port Upgrade Phase B (Car Dumper 4) track infrastructure details and other Rail support.*
- *Hope Downs & associated infrastructure design (incl. Juna Downs-Hawk options).*
- *West Angelas +25mta implications for Rail.*
- *East Angelas Order of Magnitude support.*
- *Yandi JSE expansion (Quail and Yandi Loop duplication) construction support.*
- *Tunkawanna – Rosella Rail Duplication construction support (incl. updating of Train Control Charts and Track Schematics).*
- *Karratha – Tom Price Public Road Stage 2, design and commercial interface issues.*
- *2 Mile - Dampier Road intersection upgrade, by Main Roads.*
- *Design of proposed Fuel Train decanting siding and facility at West Angelas.*
- *Design of modified (24-car) Fuel Train decanting facilities at Tom Price and Paraburdoo.*
- *Design and support for Ammonium Nitrate unloading siding at Paraburdoo.*
- *Pilbara Iron representative on the Australasian Railway Association (ARA) Code Management Company's (CMC) "Track & Civil Infrastructure Standing Committee" and the Australian (National) "Code of Practice (NCoP) Workshop" (currently considering proposed changes to the Track & Civil Codes).*

RGV
6Jan'06

Since October 2007: Owner / Railway Consulting Engineer, "BobV Rail":

October 2007 – Currently:
Providing 'as required' *(effectively part time over the period to date)* Consulting support to Pilbara Iron-Railways Division (Rio Tinto Iron Ore) on various railway Expansion Studies, Railway Electrification Study, the Automatic Train Operation project.

Consulting support to Rio Tinto/Pilbara Rail for in-house Engineering Standards review, and preliminary enquiries concerning yard lighting standards and working clearances required for various track maintenance activities in dual-track areas; on site at Seven Mile (Karratha): 13th – 19th November 2011.

Participated in Rio Tinto Rail Engineering's "Rail of the Future" Workshop, in Perth, WA, on Tuesday 7th and Wednesday 8th February2012.

Development of Railway Infrastructure Codes of Practice and Australian Railway Standards through representation of Pilbara Iron ~ Rio Tinto Iron Ore Railways Division on various ARA~RISSB Standing Committees and Development Groups *(and currently ongoing…see NOTE below).*

28th January 2009:
Submission made (in own right) to the "House of Representatives Standing Committee on Infrastructure, Transport, Regional Development and Local Government" concerning updating of the 2004 report on "Train Illumination" and other measures to reduce level crossing accidents.

Consulting support to GHD from 13 February 2009, as required through to currently:

Consulting support to GHD Melbourne for 'Traralgon' yard track and civil expansions/upgrades to refuel, clean and stable additional 'VLocity' high speed DMU (Diesel Multiple Unit) trains

Consulting support to GHD re detailed design review of 'Brighton Beach' yard reconstruction to suit stabling of Melbourne's suburban EMU (Electric Multiple Unit) trains; and detailed design review re proposed EMU stabling facilities at 'Upfield' and 'Upper Ferntree Gully'.

Consulting support to GHD re preliminary design of EMU train stabling facilities at site of former 'Paisley' station (Altona Nth).

Consulting support to GHD re track requirements for 'Craigieburn' EMU stabling/train-maintenance yard's proposed Train Wash facility, adjoining Fatality Inspection facility, and nearby (green-fields) EMU Train Maintenance Facility.

Consulting support to GHD re track requirements for 'Westall' EMU Workshops' Train-Lifting track.

Consulting support to GHD re track alignments at Altona North's Standard Gauge passing loop ('Laverton') extension and interface with proposed northern links from SCT Intermodal Yard into mainline at former 'Galvin' station site adjoining Maidstone Street level crossing.

Consulting support to GHD re submission on strategic track alignments and design options for Melbourne's proposed Western Interstate Freight Terminal (WIFT) and associated Western Interstate Goods Line (WIGL), joining the Geelong Standard Gauge (SG) line (ex Adelaide) directly into the Albion – Jacana SG line (to Sydney).

Consulting support to GHD re detailed design review of Tasmania's 'Colebrook' mainline realignment proposal.

Consulting support to GHD re detailed design review of the proposed 'Maroopna' Intermodal Terminal (near Shepparton, Vic.).

Consulting support to GHD Sydney re preliminary design's separation requirements for proposed Light Rail (Tramway) extension, adjoining linear parkland, from Lilyfield to Dulwich Hill.

Consulting support to GHD (Martin Baggott) re Pilbara mud-hole issues.

Consulting support to GHD re preliminary design review of proposed 'LOGIC' Intermodal Terminal (near Wodonga, Vic.); identification of suitable redundant track materials from the Wodonga Rail By-Pass project, for re-use at LOGIC; and drafting of technical documentation (Jan – Feb 2013) for City of Wodonga's calling of tenders for track removal and storage. Assisted GHD inspection of all recovered track materials now stored at LOGIC.

Additional Consulting studies and support activities:

From 22 October to 12 December 2009:
Consulting support to Pacific National (per Chamonix P/L) re submission to OPR (Oakajee Port & Rail) for proposed operation & maintenance of the proposed Jack Hills – Oakajee Port iron-ore railway (WA).

From 14 December 2009 to 6 July 2010:
Consulting study for Australian Rail Track Corporation (ARTC) re appropriate Rail / Wheel profiles and rail grinding intervals appropriate for use in the Hunter Valley's heavy-haul coal operations.

From 30th April 2010:
Consulting advice to Rio Tinto Alcan, Weipa (Qld) re heavy-haul railway's improvements needed to reduce operational constraints and improve track maintenance processes, to increase bauxite haulage rate.

From 16 July to 13 August 2010:
Consulting support to Pacific National re submissions to RHI (Roy Hill Infrastructure) for the operation & maintenance of the proposed Roy Hill – Port Hedland iron-ore railway (WA).

From 2nd September 2010 - 16th February 2011:
Temporary part-time role as Acting Manager Infrastructure, engaged directly by RISSB.

From 24th January to 1st February 2011:
Consulting support for FerrAus re access technical issues.

From 8th to 13th June 2011:
Consulting support for Worley Parsons (re Roy Hill Infrastructure) for railway alignment design issues.

On 16th July 2012:
Consulting support to Leighton re Pilbara track formation history and rehabilitation.

On 4th – 5th September 2013:
Consulting support to Engenium (Perth) for Samsung C&T re Roy Hill project.

On 16th October 2013:
Consulting support to JRB/MRX (Perth) re ore-car hunting detection options.

Ongoing prior to and since ending full-time service with Pilbara Iron:
Consulting support for the development of Railway Infrastructure Codes of Practice and Australian Railway Standards through representation of Pilbara Iron ~ Rio Tinto Iron Ore Railways Division on various RISSB Standing Committees and Development Groups. Presented the Heavy Haul focus for RISSB's "Major Rail Occurrence Forum – Derailments" (29 – 30th April '14).
(NOTE: RISSB activity is currently ongoing. Consulting time devoted to this work has typically averaged about 250 hrs p.a., with peak years consuming 2 - 3 times that rate.)

RG (Bob) Vanselow
21st August 2014

Status of the Scottsdale Railway's Bridges

RG (Bob) Vanselow, BE (Civ), MIEAust, CPEng, CMILT, MPWI. Tuesday 10th October 2017

- There are **ten** bridges over major rivers and creeks from the railway's junction point (about 12 km out of Launceston) through its 63 kilometre route to Scottsdale Station.
- The bridges range from 8 to 95 metres in length, and together support 367 metres of track *(about the length missing at Scottsdale Station).*
- The two youngest bridges are now 30 years, being rebuilt in 1987.
- **Five** of the railway's ten bridges are in good condition, ready to carry tourist trains without any significant repairs.
- **Four** of the other five bridges are also **sound** in their main supporting **sub-structures**, but their (upper-level) **timber decking** (which carries the track and its stone ballast) has deteriorated significantly with age.
    - As all of these four bridges carry a straight (non-curved) track alignment, it is unnecessary to re-apply the existing 'Ballasted-Bed' track structure over them. By replacing the track structure with an open **'Transom-Top'** arrangement, no timber decking or ballast is required, so rain drains freely through to ground with minimal bridge-top deterioration. 'Transoms' are effectively over-sized track sleepers that carry the railway rails in the usual way, but are fixed directly down onto the top of the bridge's main *structural steel* beams.
        - 'Transoms' may be produced from timber, recycled rubber/plastic, or prestressed concrete.
        - The **Lisle Creek** bridge (near Greeta) is a good example of a modern Transom-Top railway bridge using timber transoms.
- The **fifth** defective bridge (over Shepherds Rivulet, near Wyena) is only 18 metres long, but has a 'timber-trestle' sub-structure that has moved out of alignment, possibly requiring replacement. Further investigation is needed to determine its best repair method. Like the four others, this bridge's upper level also suffers with deteriorated timber decking beneath its track ballast. As this bridge carries straight track it is practical to replace its track structure with the lower maintenance non-ballasted open **'Transom-Top'** arrangement recommended for the other sites.

Bob V Rail's Report on Scottsdale Railway's Inspection Findings, including Primary Illustrative Photo's.

RG Vanselow BE (Civ), MIE Aust, CPEng, CMILT, MPWI

Draft issued: 7th June 2018

1. Rails and Joints:

a. **Rail Sizes.** The Scottsdale railway has been designed to carry up to 16.0 ton (16.25 tonne) axle-loads (compared with TasRail's current mainline standard of about 18 tonne). The heaviest diesel-electric locomotives that operated over the Scottsdale railway were the Z, ZA, ZB, ZC and ZR classes, which had axle loads up to this same 16.25 tonne figure, and probably operated at maximum speeds of about 30 m.p.h. (say 50 km/h), in line with NSWGR Class 3 track 'of the day' (which it seems to replicate). Most of this 3'-6" (1067 mm) gauge railway's mainline track has been rebuilt using "CR80" (Commonwealth Railways 80 lb/yard, *equal to 40 kg/metre*) rails. This rail has the same foot-width as the line's older 63 lb/yd rails, however the 80-lb rail's head is slightly wider, causing about 5 mm 'tight-gauge' track on timber sleepers that have previously been drilled for use under 63-lb rails. Most of these slightly tight-gauge track locations have been corrected by driving steel 'shims' down into the appropriate dog-spike/hole interfaces, in situ. Remaining infrequent, slightly tight track-gauge locations are tolerable for this class of track and its past uses, and more so for its proposed light-duty heritage use. Some lengths of the 63 lb/yd rail remain in mainline and siding service without any apparent short-comings. The difference between these two rail sizes is illustrated below, along with some of the various types of rail fastenings ('jewellery') used to hold them in place over time.


9008

b. **Top-of-Rail Condition.** How a rolling steel railway wheel 'sees' the transition from an early remnant 63 lb/yd rail onto the newer, more common and slightly larger CR80 lb/yd rail at a fish-plated joint, is illustrated below. Note that the 'Gauge-Corners' of both rails (their lower edges, in this photo) are in alignment to provide for the safe passage of a train's wheel flanges. Special ‘joggled’ fish-plates are used to hold this alignment.


8793

c. **Rail Side-Wear in Curves:**

i. **Curve Lubrication.** This railway has a large number of small-radius curves, some down to radii of only 100, 110 or 120 metres, and many of these ‘tightest’ sites necessarily become ‘reverse-curves’ [having opposing directions of curvature], or compound curves [having a common direction of curvature, but being of differing degrees of curvature *(i.e. differing radii)*] with minimal lengths of ‘tangent’ (straight) track between the two curves. Despite local speed limits as low as 35 km/h, and the application of appropriate amounts of Super-elevation (cross-level) around all curves, these small radius curves, over time, cause a degree of side-wear to every train’s wheel-flanges and to the rails themselves. Lubrication of the wheel-rail interface can reduce wear to both. For a railway having many wheels and only a relatively small number of small radius curves, it may be economic to lubricate from the track’s rails (provided the track-based lubricator sites are readily accessible for grease re-fills and adjustments, and labour is not too expensive). Conversely, if the operation has a **small number of trains and a large proportion of small radius curves in difficult terrain**, it is usually more cost-effective to lubricate each train’s own flanges from its leading-end or locomotive *[e.g. At least one large Pilbara Heavy-Haul railway uses spring-applied graphite-sticks to lubricate the wheel-flanges of its busy locomotive fleet].* This approach is recommended for passenger operations over the Scottsdale railway.


9300

Typical Rail-Lubricator Site in a remotely located Reverse Curve.

Side-worn 'High' (outer) Rail of small radius curve *(also 'side-wears'* ***wheel-flanges****)*:


8751


8752 'Low' (inner) Rail **lip**.


9304 **Grease Pot, Train-wheel Pump.**


9306 **Wiper Bar** on curve's outer ('high') rail applies grease upwards onto passing wheel-flange faces. Under favourable conditions, the grease may 'carry' in both directions, benefitting nearby curves having the same direction of curvature.

ii. **Re-Railing:** 8802

Excessively worn or ‘crippled’ rails are replaced in-track, joined and re-clipped.

d. **Rails through Level Crossings.** Severe corrosion of the rail-web (causing the rail head to separate vertically away from the rail foot) is the most important mode of failure to be addressed. Hand-held ultra-sonic testing of the undisturbed, in-situ rails, by ‘looking’ vertically down through the rail-head, via the rail web, to bounce an uninterrupted-vs-***interrupted*** signal, reflected off the base-line of the rail-foot.

9689

e. **Support of Rails at Bridge Abutments.** Embankment settlement behind a concrete bridge abutment proves the inherent strength of these rails to span at least four unsupported sleeper-spacings (‘cribs’) under past traffic loads from heavy log-trains and the like. Ballast top-up, compaction, and (possibly) some simple side-retention barriers to control ballast losses down both embankment batter-slopes, would help here.


9182

f. **Guard-rails across Bridges:** These can reduce derailment damage to a bridge.


9678

g. **Fish-Plated Joints.** Below**:** These may sometimes have bolts work-loose, allowing the joint gap to open completely in cold weather, causing wheel impacts and possibly some sleeper-ballast degradation (mainly under the heavily loaded log trains of the past). Fully-tightened bolts (which may be done deliberately) will create ‘frozen’ joints which then behave (longitudinally) like welded joints *(this feature is discussed later).*

8674

h. **Aluminothermic**, or thermite ***(Field)*** **Welds:** Used to repair broken rails; or to join Flash-Butt Welded rail 'strings' together, to form 'Long Welded Rails'. *(This <u>in-track</u> 'Field' welding of rails was mainly done by Dave Rigby, of Karoola.)*

8700

i. **Flash-Butt *(Fixed Plant)* Welds.** <u>Below</u>: Long Rail 'strings' have been created by Electric Flash-Butt Welding at a Fixed Plant site remote from this railway, then transported by Rail-

Train to site for end-unloading down onto the track.

8803

j. **Provisions for Track Circuits** (One way of 'triggering' Actively Protected Level Crossings)**:**

   i. **Insulated Rail Joints.** Provided at ends of electrical Track Circuits, to detect trains and operate Flashing Lights etc. for Active Protection of busy Public Level Crossings. This relatively modern IRJ is using 'Huck Bolts' to maintain its integrity.

9687

ii. **Steel-sleeper Rail-Insulating Pads.** Enable <u>Steel</u> Sleepers to be used in the vicinity of Track Circuit-driven Actively Protected Level Crossings.


8836

iii. **Rail-Bonded Joints.** Necessary for reliable Track Circuit performance wherever Fish-Plated rail joints exist inside a Track Circuit's limits.


8662

<u>NOTE</u>: However, the sometimes infrequent nature of heritage passenger operations can pose reliability problems with the use of electrical Track Circuits to activate Level Crossing protection equipment. It is recommended that the more reliable **"Axle-Counter" technology** be seriously considered instead of using Track Circuits. This would also simplify and reduce the track maintenance requirements on level crossing approaches.

2. **Track Structures:**
   a. **Rail Fasteners commonly used on the Scottsdale Railway:**
      i. **Dog Spikes** *(for timber sleepers)*. <u>Below</u>: This timber sleeper's rail-seat is steel-plated to spread the passing wheel loads onto a larger timber load-bearing area. Each plate is held down directly by two 'lock-spikes' (through the outer plate-edges) and indirectly by the rail's two dog-spikes (applied laterally 'hard-up-against', and vertically 'just-above' the respective rail-foot edges). Longitudinal rail creep is resisted in both

directions by two rail-anchors (each applied beneath the rail foot & bearing against a sleeper-side).  **8790**

ii. **Pandrol *(steel sleepers).*** Most steel sleepers on this line are this type. They originally came from the Northern Territory's narrow-gauge iron ore railway to Darwin, which closed in the mid-1976. Most are used with Pandrol's PR-series 'elastic' clips, but also able to accept their later e-series elastic clips (having slightly higher 'toe-load'). Both clip-types are applied longitudinally, making for simple sledge-hammer application / removal. These Pandrol steel sleepers are slightly shorter than this railway's timber sleepers, but this aids their ability to fully engage with the pre-existing *(ex timber-sleeper)* ballast shoulder profiles, contributing to the track's lateral resistance *(resisting track-buckle).* 
8767

iii. **Trak-Lok *(steel sleepers).*** Below: These represent a relatively small proportion of this railway's steel sleepers, but are of a more recent design (including four 'peep-holes' to view inside both rail-seat's hollow ballast pockets, to ensure they are fully-filled by compacted ballast) and using the laterally applied Trak-Lok elastic clips, which deliver a slightly higher toe-load than other fasteners being used here. They require a special tool for clip application / removal. This design of Trak-Lok steel sleeper is longer than Pandrol's but only a little shorter than the line's existing timber sleepers. Presumably, to avoid requiring additional shoulder-ballast to fully achieve the end-spooning effectiveness, this Trak-Lok sleeper design inclines both its sleeper's field-ends slightly downwards so that both end-spoons are acting more deeply inside their respective ballast shoulders, again to achieve a higher track lateral resistance (*to reduce probability of hot weather track-buckle).*


8762

b. **Sleepers, forming the Track skeleton:**

   i. **Timber sleepers:**

      1. **Unplated rail-seats.** Good quality, hard timber sleepers can perform reasonably well on this line, with or without steel rail-seat plates. This photo

shows unplated timber sleepers in mainline track.


8990

2. **Steel Rail-Seat Plates:** Poor quality, soft timber sleepers should be avoided if possible. Steel rail-seat plates may not provide enough help for them.


8866

But: *Quality hardwood timber sleepers (e.g. 'Stringybark' gum) remain an option for maintaining Tangent tracks and the larger-radius curves, preferably with steel rail-seat plates included, especially in curves.*

ii. **Steel sleepers:**

1. **Pandrol**  8957

2. **Trak-Lok**  8761

3. **Pandrol -vs- Trak-Lok**  9242

4. **Trak-Lok -vs- Timber**


8763

c. Track-Ballast Profiles when supporting:

i. **Timber sleepers**  **8687**

ii. **Timber -vs- Pandrol *(steel)* sleepers**

9119

iii. **All-Pandrol *(steel)* sleepers**

9010

d. **Finished Track:**

i. **Unplated Timber Sleepers** (*Photo includes 'Rail Anchors' surrounding Joint area*)

9001

ii. **Plated Timber Sleepers**

8857

iii. **All-Pandrol *(steel)***  8926

3. **Track Alignment: Curves and Tangents**
   a. **Good Alignments:**
      i. **Reverse Curves:** To avoid wheel-unloading *(a potential derailment initiator)* the '**Twist**' or rate-of-change in Super-elevation between reverse curves, and at both ends of all other curves, must not exceed **15 mm in** 30 ft (**9 m**) of track *(TBC).*


9412


9223

ii. **Sharp Curves** (Above; Below) 9294

9376

b. Alignments deserving Attention (including **Lateral Clearances** in **Curved Cuttings):**

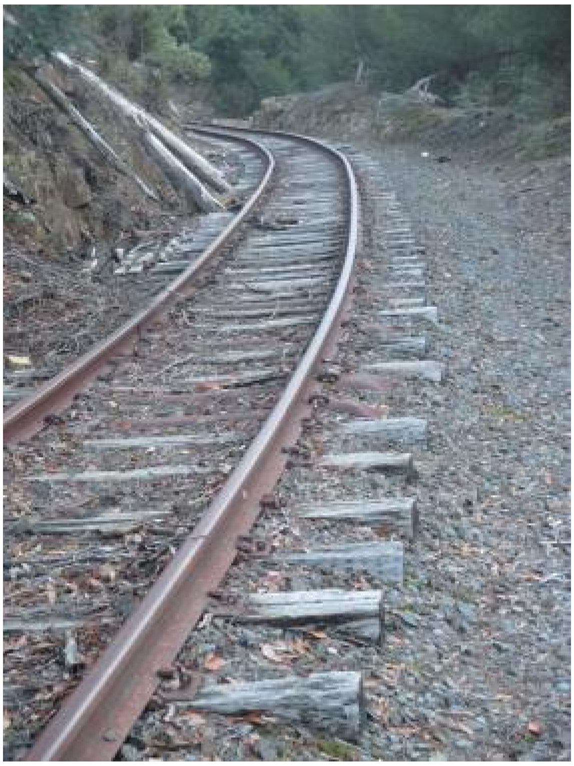
i. **Ballast wash-out caused Track-Buckle in long Down-hill Curve**

9636

ii. **Down-hill Creep at Curve exit** (caused by heavy log-trains braking to control speed)

9157

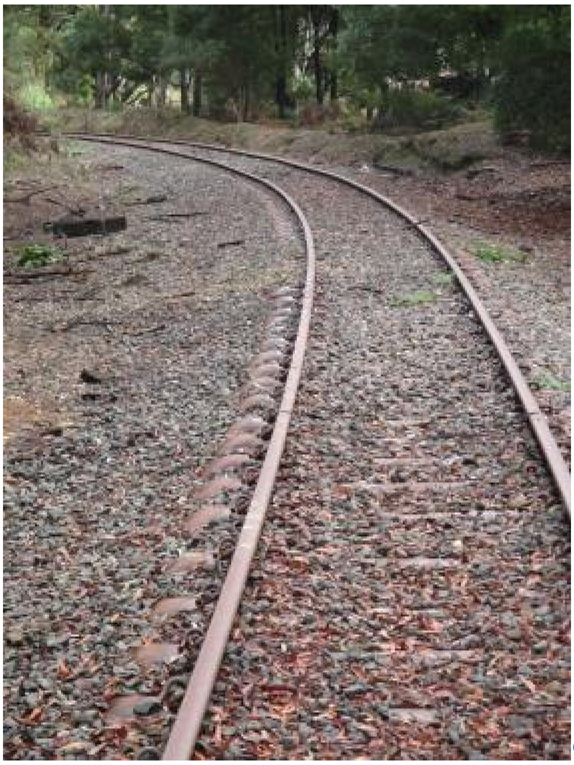
iii. Lateral Clearance infringement-avoidance 'Kink' in Curved Cutting.



9418

c. Steel Sleeper Ratios for different Alignment Curvatures:

i. **<u>All-Steel</u>:** (especially helpful in **Sharp Curves**):



9303 **Pandrol** steel-slprs, **120 m Rad.**

9144 Tangent, **<u>ex Derailment Site</u>**.

ii. **Steel 1 in 2**: Below: Pandrol steel-sleepers through **200m Radius** curve.

9226

Below: Assisting Lower-quality Timber Sleepers *(failing, despite having Plated-steel rail-seats*. NOTE: 'Stringybark' gum can provide a quality, hard timber, while 'White-gum' has often proven too soft for sleeper service here.

9222

iii. **Steel 1 in 3**: Below: Pandrol 1 in 3 steel-sleepers through **200m Radius** curve.

9377

9437

Above: Trak-Lok 1 in 3 steel-sleepers through **120 m Radius** curve.

9153

Above: Trak-Lok 1 in 3 steel-sleepers through **150m Radius** curve.


9240

Above: Pandrol 1 in 3 steel-sleepers through **200m Radius** curve.

iv. Steel 1 in 4 ; and 'Spot' Repairs:


9432 **1 in 4** Trak-Lok in **100 m Rad. curve.**

1 in 4 Pandrol steel-sleepers through **140 m Radius** curve.

9416

Below: Trak-Lok Steel sleeper's use for a **'Spot'** repair (at an aged derailment site).

9385

Although it is possible to operate safely (with certain restrictions) over long sections of track having only 1 in 5, or 1 in 6 "Effective* sleepers" forming the mainline's track skeleton, no obvious examples of this practice, using interspersed steel sleepers at these ratios, were observed. However, it *may* have occurred in earlier times, by interspersing with 'then-new' timber sleepers at these intervals (if so, it is now much less apparent than it would be with steel sleepers. However reasonably healthy mainline timber sleepers carrying **Date Nails** aging from 1971 – 75 were occasionally sighted during the inspection. It is understood that the use of Date Nails concluded in 1976). Occasionally in 'All-Timber' sleepered tracks, where **'Spot'** replacements within localised patches of some poorer timber sleepers had been made, these 1 in 5 or 1 in 6 target "Effective sleeper" ratios had been applied, but 1 in 4 was more commonly applied for steel sleeper insertions. *(It seems that these poorer patches of timber sleepers were not consistently interspersed with Steel sleepers at those wider intervals, as generally each 'patch' was too short to gain much saving in sleeper numbers)*. This 'spot' repair method of addressing 'patches' of poor timbers occurred mainly in Tangent tracks and some of the larger radius curves (e.g. of about 600 m radius and larger). *[*"Effective sleepers" are those **effectively holding both rails in position**].*

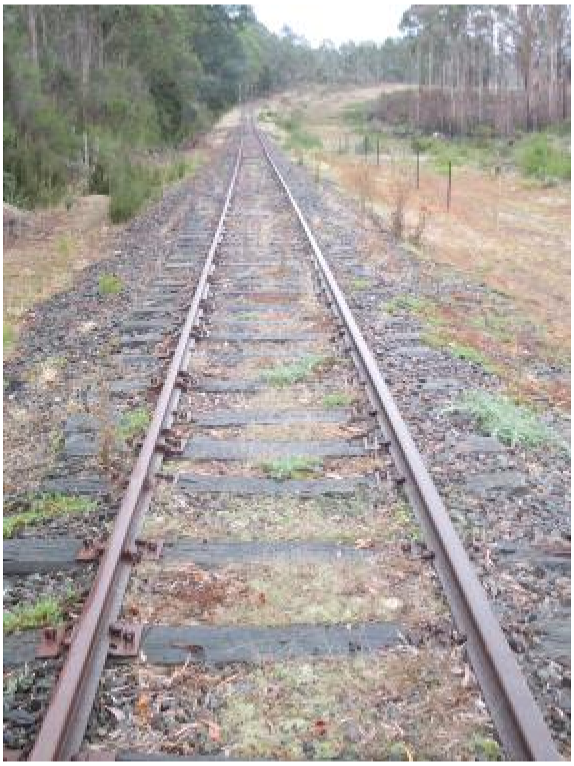
v. **All-Timber (mainly in Long Tangents):**

Above: **Unplated** Timber Tangent 8969

Below: **Plated** Timber sleepers through **400 m Radius curve**

9216

Plated Timber sleepers through a very long Tangent.



9230

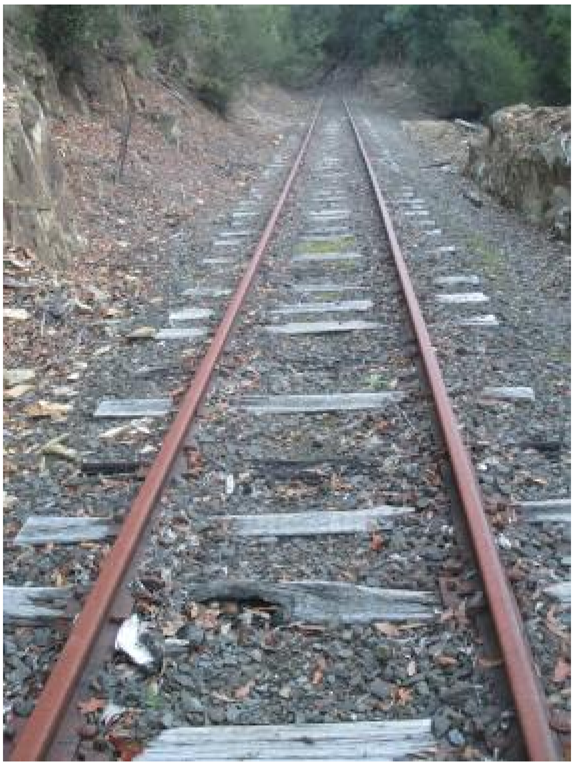
Below: **Plated** Timber sleepers through a long Tangent.

9378

Plated Timber sleepers through long Tangent.

 9383

Below: Plated Timber sleepers through another Tangent.

 9422

Below: **Set of 3 Defective sleepers** (**3** in 4; or **1 in 4 = OK**). All are Plated Timbers.

9420

Below: **Plated** Timber sleepers through **160 m Radius curve**.

9699

<u>Un</u>plated Timber sleepers through **160 m Radius curve**.

9705

9709

Unplated Timber sleepers in long Tangent.

4. **Tunnel:**  9538 Entrance Portal, arriving from 'Tunnel Station' and Lilydale. Note that rainfall run-off water from this approach-cutting's two (well vegetated) catchment areas presently flows down-hill along the track-bed area to enter this tunnel portal. This water (plus some internal tunnel weepage water) eventually discharges into track-drains at the tunnel's (lower) exit- portal, some 35 chains (700 metres) distant, and 12 metres lower (the track-gradient through this area is 1 in 60, or 1.7 %). Any existing 'cut-off' drains on this upper cutting's two batter-slopes could be explored for review, as they might be capable of being re-graded to direct and discharge some of this run-off water 'back' towards the Station vicinity. However, care needs to be taken to preserve the heavy vegetation on these slopes, which constrains rapid run-off from storms. Past attempts to build drainage pipeline(s) along one side of the tunnel floor have been abandoned …. pipes broken but not removed. It is worth noting that there appears to be no evidence that this surface water's long-term presence has been a problem for past railway operations, and it also appears that the tunnel structure's long-term integrity, as well as its railway's track integrity, are not being compromised by it. *Track-side drainage down-stream of the tunnel exit will be discussed later (Section 7).*

Above: 'Man Holes' are 20 metres apart.  9545

 9550 Upper-wall's Brick lining curves up into roof Arch.

 9541 Conc-to-Brick lining, at 2.4 m height.


9549 *'Spring'* water weeping above 460 mm thick conc. wall.


9548 Past drainage attempts.


9551 Roof's Brick-lined Arch, 360 mm.


9539 To achieve vertical clearance to roof-arch, a small number of steel sleepers have been used over a section of extra-hard rock floor.


9557 Downhill exit, towards Lebrina and Scottsdale.


9604 Side-insteps show tunnel-floor has been lowered throughout (in more recent times) to accommodate containerised-freight traffic.


9597 Portal Pillars, 460 mm thick, in good condition.


9559 Micro-climate's plant-life on opposite Pillar.


9598 Opened in **"<u>1888</u>"** *Built to last.*


9588

5. **Bridges:**
   a. **Lady Nelson Creek (4.4 km)**

   Refer to Clynton Brown's *(12th May 2017*) "**Report on track from Lady Nelson creek to Cold Water creek junction**", which includes four photo's of this bridge. The Report states: "The bridge is of concrete and steel construction, with a recycled-rail deck, no damage or wash-outs of abutments." Refer to Appendix at end of this Report.

   This robust bridge structure ***(of 6 spans? TBC)*** has an approximate total length of 60 metres, and a fairly constant height of only a few metres. The bridge is located wholly within a 520 metre long Tangent (straight) section of track. Its ballasted 'All-Pandrol' Steel-sleepered track skeleton is not provided with Guard Rails (being wholly in Tangent track and carried on a robust all-steel welded deck). *See the first four photo's of Clynton Brown's report.*

   b. **Pipers River (13.5 - 13.6 km):** Viewed from vicinity of Karoola Station


9782

Below: The original Main Bridge's 20m span is now centrally supported.


9800


9797 This original Main Bridge abutment also serves to support the first of the 1991-built 9-span concrete and steel bridge structures (which replaced 75 metres comprising the original timber trestles).


9801


9832 The total 95 metres of track (equipped with Guard Rails) across this bridge has its ballast supported by **timber decking and side-kerbing**. Both components are rotting and now **need replacement**. Rotting of these timbers is caused by rain water becoming trapped in soft, fine ballast particles and other 'ballast-fouling' matter lying on and against these (inherently slow-draining) close-fitted timber members. This particular ballast's inherently slow self-draining ability doesn't help either. Instead of simply replacing like-for-like, **a Transom-top <u>ballast-free</u> track structure, similar to the 1987 rebuild of Greeta's "Lisle Creek" bridge** (45.8 km)**, is recommended for longevity.**


9820 Ballast-holes through failing timber decking and failing timber side-kerbs.

**9795** Typical failing of timber-decking and side-kerbs, creating open holes and loss of ballast support for the track skeleton (at 26 years of age). A 'transom-top' ballast-free track-structure would be free-draining between its transoms, significantly extending track-integrity. Transom-top ballast-free railway bridges are used extensively throughout rural NSW, as well as on the 300 km Standard-Gauge Interstate mainline through Victoria to Melbourne.

c. **'Local Low Point' (22.6 km)** **9747**

This bridge is the shortest on the railway, being a single span of about 8 metres. It is not equipped with Guard Rails. The bridge is of the 'ballasted track over timber-deck' type, and accordingly has the same problems with rotting timber decking and side-kerbs, causing ballast losses and, consequently, a poorly supported track skeleton. However, beneath its failing decking, its main steel box-girder structure and supporting concrete abutments appear to be structurally sound. Again, **a Transom-top <u>ballast-free</u> track structure, similar to the 1987 rebuild of Greeta's "Lisle Creek" bridge** (45.8 km)**, is recommended for this bridge's form of track-support.** One secondary issue warranting consideration: The shortness of this bridge will require either some <u>lowering</u> of the adjoining track approaches (possibly undesirable for peak flood events, but operationally tolerable due to the 40 km/h speed limit already applying close by). Alternatively, increasing the effective cross-sectional depth of the bridge's track-transoms *(possibly by robust packing),* rail levels could match <u>existing</u>.


9748


9743

<u>Note</u> *that the <u>two</u> 'Open-top Culverts', located to each side of the nearby Highway B 81 (Golconda Road) Level Crossing, are not considered by this writer to be "Bridges" in the usual meaning of the word. Each feature is considered to be an open-top concrete culvert (or 'gutter') enabling this highway's road-side-drainage to pass unimpeded beneath the railway's track skeleton (thence on its way collecting road run-off water for eventual discharge into a natural watercourse). Two more of these 'Open-Top-Culverts' exist at Nabowla's Lisle Road Level Crossing, and a single, much smaller version (referred to as a 'Trough-Gutter') exists at the Lister's Lane Level Crossing. Details of all these, under "Level Crossing Drainage".*

d. **Mc Gowans Creek (22.96 km)** The bridge is about 14 metres long (2 x 7 m spans), and is located within a curve of 160 metres Radius. This timber-topped steel and concrete bridge appears to be structurally sound and fit-for-purpose. It is of the 'ballasted track over a <u>thick-timber</u>, <u>closed-deck</u> type. Its closely-spaced timber-sleeper type deck *(which appears to be relatively young)* consists of continuously-abutted treated, Gang-nail ended, hardwood sleepers. On both ends of the deck timbers are mounted large-sectioned, treated hardwood side-kerbs. This robust timber-deck structure supports a ballasted timber-sleepered track skeleton, which is equipped with Guard Rails that start in the curved approaches outside the bridge abutments.


9714


9717

e. **Second River (23.45 km), adjacent to the 'Lilydale Falls' Stopping Place.** This concrete and steel bridge appears to be structurally sound and fit-for-purpose. It is of the 'ballasted track over **steel-deck**' type. Its deck and side-kerbs consist of recycled rails welded in place. It is about 31 metres long (2 x 15.3 m spans), and is located at the end of a 160 m Radius curve leading into a short Tangent track. It is equipped with Guard Rails.


9669


9670


9677

Pedestrian underpass leads onto a short walk upstream to two *'Lilydale Falls'* sites.


9680

Looking across the bridge towards the "Lilydale Falls Stopping Place" location.

f. **Shepherd's Rivulet (37.75 km)** This short 18 metre timber Trestle bridge consists of three spans, each about 6 metres. One of its two central-trestles has partly subsided on its founding and is leaning slightly downstream, causing track misalignments (both vertically and horizontally). Below the Trestle's timber track-decking, and connecting between the two trestles and end-abutments, are two load-bearing longitudinal timber beams. These are showing structural deficiencies and atleast one improvised vertical-packing repair. Atop this doubtful supporting structure, the bridge is of the 'ballasted track over timber-deck' type (with Guard Rails provided). In keeping with its age, it has the same problems as some other bridges, with rotting timber decking opening into holes (releasing ballast), and side-kerbs breaking away (releasing more ballast), so leaving a poorly supported track.

9345 Despite appearances in the above photo, the bridge is located within a 50 metre long section of Tangent track. Fortunately, this allows the whole trestle bridge structure to be replaced by **one single straight-span** steel box-girder of about 17 to 18 metres in length (no piers required).

9342


9344 Above: Decking holes.


Above: Failed kerbing. **9350**

Below: Aging timber support beams; timber-packed onto trestle cross-beams.


9366

9085 Box Girder of 17.3 metre span & matching abutment @ Lt Forester Riv. (Main bridge) - **Recommended for copy to completely replace, in one span, the existing 18 metre long timber trestle bridge, utilising its two existing** (strengthened or replaced) **concrete abutments. Atop this, a Transom-top ballast-free track structure, similar to the 1987 rebuild of Greeta's "Lisle Creek" bridge** (at 45.8 km)**, is recommended for longevity** (see Lisle Creek, Below).

g. **Lisle Creek (45.8 km):** Rebuilt in 1987 to this **'Transom-top'** design *(now site- proven)*. ***This concept is the recommended 'non-ballast-bed' option for restoration of all tangent bridges having life-expired timber decking & kerbing***.

9180


9181


9209


9186 ***Note*** *that the Raylink report makes a questionable statement about the condition of this bridge's timber transoms. That report includes one photo taken at this bridge (which shows one end of one transom, displaying some minor surface-weathering, but otherwise apparently in reasonable condition), and says* "The bridge is in reasonable condition except for the transoms, which require replacing before trains commence operation." This Raylink conclusion is apparently an error of fact; as evidenced by the above 4 photo's (and 10 others available), taken only three months earlier. (On Sunday 23rd April 2017 this author, accompanied by two local track-experienced personnel, spent a solid 60 minutes

inspecting and documenting this bridge's unique, project-significant features and fit-for-purpose condition. This team was of the opinion that **none** of the bridge's transoms required replacing, and that the complete structure, including its track, was fit-for-purpose, ready for trains to commence operation). However, it must be acknowledged that TasRail's records on each of this line's bridges will still need to be thoroughly examined before absolute conclusions can reliably be made about any bridge's fitness for purpose.

h. **Little Forester River – Main bridge (47.65 km)**

9069 This bridge comprises three steel box-girder spans of 17.3 metres, supporting 52 metres of track (with Guard Rails). This bridge's track-ballast is supported by **timber decking and side-kerbing**, which are both rotting and **need replacement**. As with some other bridges featuring this type of track support, rotting of these timbers is caused by rain water becoming trapped in soft, fine ballast particles and other 'ballast-fouling' matter lying on and against these (inherently slow-draining) close-fitted timber members. **A Transom-top <u>ballast-free</u> track structure, similar to the 1987 rebuild of Greeta's "Lisle Creek" bridge** (45.8 km)**, is recommended for this bridge's form of track-support.**

9077 Main Structure is sound.


9095 Conc. abutment's apron slight under-cut.

9072 Temporary track-fix.

9089 Extensive failing of timber track-decking.

i. **Little Forester River – Floodway bridge (47.8 km):** This bridge comprises four short steel box-girder spans, each 4.5 metres in length, supporting a total 18 metres of track (with Guard Rails). All the main structural elements of this bridge appear to be in good condition. However, like its close neighbour, this bridge's track-ballast is supported by **timber decking and side-kerbing**. Both of these timber elements are rotting and **need replacement**. Again, a **Transom-top <u>ballast-free</u> track structure, similar to the 1987 rebuild of Greeta's "Lisle Creek" bridge** (45.8 km)**, is recommended for this bridge's form of track-support.** One secondary issue warranting consideration: The relative shortness of this bridge, and its close proximity to its larger neighbouring bridge, will require either some <u>lowering</u> of the adjoining track approaches (possibly undesirable during peak flood events), or alternatively, by increasing the *effective* cross-sectional *depth* of the bridge-track transoms *(possibly by robust packing)*, to match the existing rail levels.


9051


9052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9055


9067 *Note that the Raylink report makes an unfortunate statement about the condition of this bridge. That report includes one photo of this bridge, and says* "The deck of this bridge is timber, the beams are steel and the abutments and piers are concrete. The bridge is in reasonable condition throughout". It is clear that the last part of this Raylink conclusion has been made in error, as evidenced by the above **6** photo's (and **14** others), taken by this report's author three months earlier than Raylink's. (On Sunday 23rd April 2017, this report's author and two local track-experienced personnel, spent 30 minutes inspecting and documenting this bridge's features and condition. The team agreed the bridge's main load-bearing sub-structure comprising steel box-girders, supported by concrete piers and abutments, are fit-for-purpose. However the bridge's upper-level timber decking and side-kerbings, intended to properly support the track's ballast and track skeleton, are unfit for purpose, requiring replacement before trains commence operation.

j. **Little Brid River (58.5 km).** Rebuilt in 1987, at a reported cost of $1m, this 49 metre (7 spans x 7m) bridge is located within a curve of 160 metre radius, and is the tallest bridge on the railway. This may explain its use of timber pylons in lieu of the usual reinforced concrete columns provided on other bridge rebuilds of that era. Needing to accommodate the railway's small radius curve probably drove the decision to use a ballasted track structure *(rather than trying to apply an open-top timber-transom design, which is best suited to mounting onto straight steel box-girder spans).* The bridge does, however, use reinforced concrete for its pylon footings and head-stocks, as well as for its curved track-decking and the lower part of its ballast side-kerbs. Hardwood sawn-timbers (apparently of good quality) have been restricted to the upper part of the ballast side-kerbs, and all this bridge's ballasted track sleepers, indicating an improved understanding of where timber materials can/should-not be used in this railway's bridges. Drain-holes are provided at regular intervals through the central parts of the concrete slab-decking, and the ballast quality appears superior, offering free-drainage and zero weed-growth. Steel angle-iron cross-bracings lend lateral sway resistance to the bridge's timber pylon-sets. Guard rails are wisely provided on the track skeleton of this tall, unique, sharply curved bridge.


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8807


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6. Railway Culverts:

a. **In situ Formed Concrete Arch & Headwalls.** <u>Below</u>: The <u>Earliest</u> and also the <u>Best</u> Culverts.

8860 <u>Below</u>**:** Lasting quality, clean, working.

9296

15 ft high. *<u>Finest in the Colonies</u>*

<u>1887</u> '*Jubilee Arch'* Culvert, Denison Gorge *Inspection: Wayne Venn; Photo: Clynton Brown*

b. **Pre-cast Concrete Pipe with (disconnected) Pre-cast Headwalls:** Inlet partly blocked **9217**

Below: Outlet h'wall by-passed by flow **9218**

Below: Outlet pipe fully blocked **9219**


Below: Inlet blocked, Formation collapse **9249**


Below: Outlet by-passed **9250**

Below: Flow-hole in Formation **9251**

c. **Concrete Pipe** <u>**without**</u> **Headwalls.** Outlet apparently 'dry'. **8906**

<u>Below</u>: Inlet damaged, partly ineffective. **8908**

<u>Below:</u> Inlet-**rocks** encouraging ***'piping'***. **9638**

 …causing Formation collapse,

9652  … & ballast Wash-out & Track Buckle, and

 **9637 …** the partially obstructed Outlet (obstructed by flood debris ex the track area), & formation-piping's outlet-flow hole (covered by the old sleeper). ***Warning***: Encouraging or not-preventing drainage-water ***'Piping'* through** the track-formation **around the** **outside** of culvert pipes is effectively

inviting **formation wash-out** which also removes track-ballast, compromising track-integrity.

d. **'Change-of-side' Pipes through track at Cutting's drainage exit**


8850


8853 Is it necessary to retain this deteriorated drainage feature, as Lietinna Station's Yard tracks are now gone? *(Ask Herbie Worker, retired Head Track-Ganger / Station Master, Lietinna).*

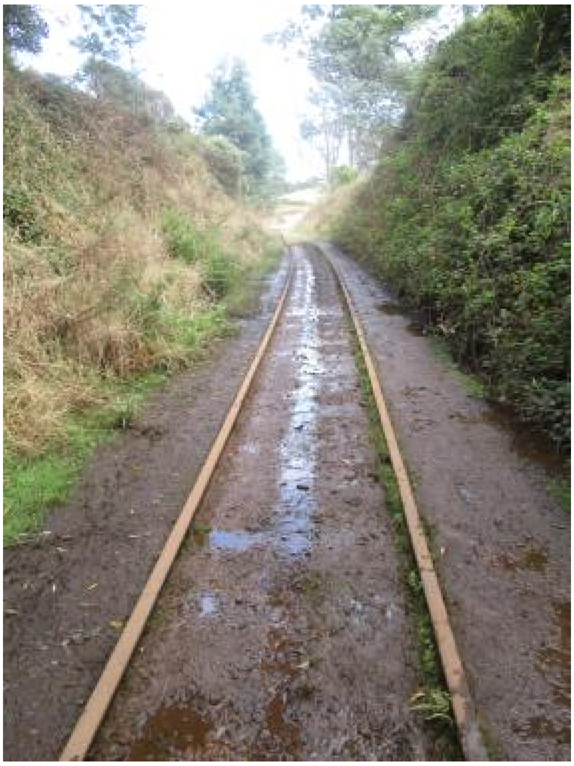
7. Track-side / Level Crossing Drainage:

a. **Adequate Track-side Drainage** Drainage appears reasonable for a summit's cutting.

9134

9563 'Busy' drains are preferred on the <u>inside</u> of curves (track inherently less likely to buckle inwards). Busy drains on the outside of curves may reduce the ballast-shoulder, thereby compromising the track's <u>lateral stability</u> (so reducing its ability to resist track-buckles in hot weather).

b. **Trackside Drainage deserving Attention** Drainage to be kept clear of Track-skeleton.


9529 **Side-d**rains invading the Track-skeleton.


9575 Below: Vegetation invading side-drain, which is then invading the Track-skeleton.


9578

c. **Level Crossing Drainage types:**

i. **Open-top Culverts (22.7 km, Golconda Rd, < Lilydale Falls):** Renew timbers. **9732,**

... same on other side of Highway B 81.

9726

ii. **Open-top Culverts (both sides at 49.0 km, Lisle Rd, Nabowla):** Looking good. **8975**

… but culvert on other side of Lisle Road needs its timbers renewed (see its photo at 8 (b)).

iii. **In-fill Ballast 'downgrade' (52.55 km, Mc Kays Rd, Blumont).** Now '<u>Fit-for-Purpose</u>'

8895

iv. **Concrete Trough-Gutter under Track-skeleton (61.7 km, Listers Lane, < Scottsdale)**
Appears to be adequate *(but difficult to inspect quickly).*

8724 Needs weeding.

8726

8. **Level Crossing examples *(i.e. not all sites are included here)*:**
   a. **Public, Actively Protected *(9 sites illustrated)*:**

i. **22.75 km** Highway B 81 (Golconda Road). Viewed towards Lilydale.

9723

9733 Viewed from the Lilydale side of the Highway, looking towards the Lilydale Falls Stopping Place.

ii. **24.1 km** Highway B 81 (Golconda Road) beyond Lilydale Falls.

9693 Towards L'Falls.

Looking up-hill 9694


Looking towards Bacala 9696

iii. **25.4 km** Looking across Bacala Road (C 821) towards Lilydale Falls.

9623

Looking beyond L/Xing & Bacala Station's former site towards 'Tunnel' Stn.

9629

iv. 31.94 km Approach from Lebrina Station towards H'way B 81 (Golconda Rd).

9475

v. 32.62 km Below: Approaching Butlers Road from Lebrina Station (to Denison Gorge).

9462

9472 Butlers Road, shop.

vi. **49.0 km** Lisle Road, Nabowla (looking towards Highway B 81, Golconda Rd).

8974

vii. **58.04 km** Approaching Highway B 81 (Golconda Rd), Lietinna, ex Scottsdale.

8841 Level X'ing, Station.

8842

Below: Looking back across Golconda Rd towards Scottsdale.

8845

viii. **62.42 km** ‘Below the Saleyards’ L/Xings, Golconda Rd/Williams St, Scottsdale.

8670

Both: Viewed away from Scottsdale. Foot/Bike path along right side of Road.

8686

Below: View towards Scottsdale. Foot / Bike path L’Xing in distance.


8696

<u>Below</u>: Looking away from Scottsdale, at the main Level Crossing site itself.


8704

ix. **62.98 km** <u>Below</u>: Coplestone Street L/Xing and Scottsdale Station approach. *(photo ID deliberately uses* viiii *for auto-sequencing)*


8647


8643 Above: View towards Golf Course.

Below: Road & Pedestrian approaches from South to North side of L/Xing:

8646

b. **Public, Passively Protected** *(7 sites illustrated)*: All of the following illustrated Public, Passively protected Level Crossings (except the 29.05 km at "Tunnel Station") have had their road approaches' "Stop, Look for Trains" signs temporarily replaced by "Railway Crossing Not In Use" signs. When the temporary signs are being replaced it is recommended that the minimum standard should be **"Stop, Look for Trains"** signs. Any past use of "Give Way" signs *(alone)* is not recommended for this railway's mainline level crossings. *(This is in keeping with current practices across most mainland States, from which many of Tasmania's self-drive tourists are sourced.)*

i. **13.38 km** 9840

ii. **29.05 km** 9490

iii. **42.5 km** 9278

iv. **48.8 km** 8976

v. **51.11 km** 8965

vi. **52.55 km** 8892

vii. **61.7 km**  **8723**

 **8730**

c. **Private, Occupation Crossings – *Currently* 'Unprotected'** *(6 sites illustrated)*:

i. **23.28 km**  9707

 9706

ii. 28.3 km 9507

iii. 42.9 km 9281

9283

iv. **46.02 km** **9174**

9178

v. **52.0 km**  8919

 8920

vi. **56.9 km**  8890

d. **Pedestrian / Bicycle Crossing adjacent to Actively Protected Level Crossing (at 62.42 km, < Scottsdale)**

8682

8684

8645

e. **Pedestrian / Disabled Underpass beneath Second River Bridge at 23.45 km, Lilydale Falls**

9671

9676

9. **Passenger Stations & Stopping Places** *(there may be others)*:

a. **Karoola**  9760

 9774

b. **Lilydale**  9753

 9749

c. **Lilydale Falls (Stopping Place)** 9678

9679

d. **“Tunnel” (Station)**  9493

 9618

e. **Lebrina**  9461

f. **Denison Gorge (Stopping Place)**

9445

9443

9441

g. **Wyena**  9324

h. **Golconda** *(Platform is 100m distant)*  **9275**

i. **Nabowla**  **8980**

 **8972**

 **8991**

j. **Lietinna**  **8848**

k. **Scottsdale**  8620,

 8616

 8619

10. **Location of Track Turnouts ('Points'):** Most of the turnouts sighted during the inspection are angled **1 in 8** at their Point-of-Crossing ('Frog'). *(<u>Note</u>: Some are incomplete, while others are near-complete and connected to a Passing Loop or short Siding to enable a degree of train shunting. There may be others, not visited. Consolidation and rationalisation of the turnouts available may be required prior to commencing operations. More turnouts will be needed later to meet particular train service and maintenance requirements.*

a. **Karoola** 9772

b. **Lilydale** 9750, 9758

c. **Lebrina** **9465, 9474**

d. **Wyena** **9327**

e. **Nabowla** 8992,  8993

f. **Scottsdale** 8617 

g. **Coldwater Creek Junction** (on TasRail mainline from Launceston to Bell Bay):

Bell Bay line to left; **Scottsdale line to right** (0.0 km location). This junction links Launceston to Bell Bay and Scottsdale. It also *(less directly)* links Scottsdale to the port of Bell Bay. Strategically it is important this junction be retained as an asset to benefit all parties, now and for the future. The currently proposed infrequent operational use of the Scottsdale line from here to Turners Marsh (9 km) might make it useful for railway training purposes. The first kilometre or so might also be useful for TasRail's occasional operational / recovery needs regarding their Bell Bay services.

11. Railway Operational Signs, etc.:

a. **Sharp-Curve's Speed Limit sign** **9308**

b. **Area-wide Speed Limit sign** 

9735

c. **Whistle board** (Level Crossing Approaches)

9158

12.

a. **Level Crossing (Train Speed) 'Predictor'** (added to Active Protection)


9476

b. Track Location (Km and ½ Km) from Coldwater Creek Junction

9284

8900

c. **‘No Public Access’ signs (Bridges, etc.) 8829 8816**

d. **Station Approach Signal / Sign Post**


9011


9009


8667

e. Rail-Creep / Survey Monument

8833

f. Timber Sleeper's *(in situ condition-management)* 'Date Nail'


8876

Appendices to be added later.

Bob V Rail’s Report on Scottsdale Railway’s Inspection Findings, Specifically Lilydale to Wyena.

RG Vanselow BE (Civ), MIE Aust, CPEng, CMILT, MPWI
Draft Issued: 14th June 2018

Stage 1 – **Lilydale** *(starting at 21.1 km, clear of the ‘Station Road’ Level Crossing, and about 300 metres on the Launceston side of the Station platform)* **through to Wyena** *(finishing at 37.5 km, about 600 metres ahead of the Wyena Station platform, and about 150 metres short of the ‘Shepherds Rivulet’ Trestle Bridge).*

The Raylink report states that the cost to rehabilitate the necessary rail infrastructure between Lilydale and Wyena for operation of the rail car is approximately $4.0m.

At **Lilydale** there are already two tracks through the Station’s yard, connected to the mainlines at both ends by way of turnouts. This arrangement enables rolling-stock items to be re-arranged by shunting, or temporarily parked clear of the Station’s platform track. These abilities will aid track-based restoration of future Stages located both sides of Lilydale.

9753,


9749 

At the township end of Lilydale yard, towards Station Road, at least 120 metres of the future-extended mainline single track (clear of the existing turnout) is available for train shunting activities and/or temporary parking of rolling-stock items.

At **Wyena** the rail car's journey will *(temporarily)* finish just ahead of the left-hand curve leading onto the bridge *(due for replacement)* over Shepherds Rivulet.

This Stage 1 section of the railway is the most scenic part it, with its 1888-built 700 metre long Tunnel, and the 1887 Queen Victoria 'Jubilee' Arch-culvert, which guides the Denison River through the embankment, deep beneath the railway. In the past a pathway had been developed for visitors to descend to river level, for a better appreciation of the Denison Gorge and its famous 'Jubilee' Arch. This path could be redeveloped.

Sleeper replacement and Rail-Joint Rehabilitation:

The Raylink report states that it would cost \$1.89m for re-sleepering works, and \$0.94m for fish-plated rail-joint rehabilitation. That amounts to \$2.83m across the railway between Turners Marsh and Scottsdale. For this Stage 1, the report estimates these costs amount to \$700,000.

The Raylink report's premise about all fish-plate bolts having to be cut-off and replaced, has amounted to that action not being required. This railway's mainline track has been built from rail 'strings' comprising fifteen 45 ft. rail lengths welded together to form 200 metre "Long Welded Rails" (LWR), which are connected together in-track by mechanical 'fish-plated' joints. Only the two outer ends of LWR strings are possibly subject to temperature driven expansion/contraction movements. Some pairs of these 200 m long 'strings' have been field-welded together to form 400 m long 'strings', which are then classified as being "Continuously Welded Rail" (CWR). Only rails shorter than 110 m are classified as being 'Short Welded Rails' (SWR), joined to each other by mechanical (fish-plated) joints. No SWR examples were sighted during our April '17 inspection of this railway. Refer to AS 7639 "Track Structure and Support" Appendix B, Clauses 5, 12 and 17.

Furthermore, the ability of LNER to obtain adequate numbers of second-hand steel sleepers from Tasrail free of charge; their transportation to site by others, again at no cost; and installation into the track by volunteers, means that virtually none of these anticipated expenditures will be required.

A lot of this section of track is mainly in curves which already have a reasonably high percentage of steel sleepers.
BobV RAIL's first estimate of 'Bad' timber sleepers needing to be replaced, was based on field judgements made by Wayne Venn during our walking inspection in April '17. For this *(new)* Stage 1 section (from Lilydale to Wyena), this first estimate indicated that about **<u>713</u>** 'bad' timber sleepers (2.7% of all sleeper positions) need to be replaced by steel sleepers, to enable a basic Railcar-only operation to begin.
BobV RAIL's second estimate was based on a later desktop evaluation reflecting the desirable proportions of 'effective' sleepers required for each curve's radius *(based on a simple model developed by BobV)* to enable full operation by locomotive-hauled passenger trains. This estimate for the same Stage 1 track section required an **<u>additional 1,431</u>** (5.3%) steel sleepers to be inserted, or **<u>2,144 in total</u> (equivalent to <u>8.0%</u> of all sleeper positions)**. This estimate might be slightly higher than necessary, as it ignores those timber sleepers currently in-track that are still "effective" in securing the rails. A more detailed walking inspection would be required to re-quantify to this level of detail. In any case, those "effective" timber sleepers, if removed from mainline, may be stock-piled for use in yard track extensions and maintenance.

It is worth noting that the Raylink report recommends that **<u>4,566</u>** timber sleepers be replaced in this Stage 1 section of track. This is equivalent to **<u>17.0%</u>** of all sleeper positions, which is **more than double** the BobV RAIL recommendation. *This significant over-estimate is driven by the original Raylink recommendation that at least **1 in 2** sleepers should be "effective" (because 'other heritage railways' apply that ratio), while the Australian Standard on this matter only requires about half that number (such as 1 in 4) to be "effective".*
Ultimately, we may well be able to achieve or better those high proportions of steel sleepers, but right now we need less ambitious targets that are realistically achievable and safely fit-for-purpose.

The Tunnel:

Why we would retain the tunnel *(apart from getting to the other end)*: It is much safer for people to experience the tunnel from a train than on foot, as you are safely enclosed with others on what is effectively a familiar, slow moving 'viewing platform' - not slipping around on wet ground, feeling alone and claustrophobic, particularly when it's another 350 metres to the nearest exit.

<u>Tunnel and drainage</u>:
The Raylink report has been critical of having a tunnel with some water moving through it. However, it is the nature of underground tunnels worldwide – that small water leakages are a common phenomenon inside them. Some have more than others. In a *'perfect world'*, all railway tunnels would be located near the crest of a hill, with the railway's vertical alignment deliberately designed to include a crest vertical curve near its centre. This would ensure internal leakages are shared to drain to their respective nearest exits, and that little or no externally generated drainage flows can enter the tunnel entrances. Unfortunately, like a great many *'real world'* tunnels, this tunnel has had to be located where it is, for other good engineering reasons that over-rode the drainage considerations. Consequently this 700 m long, straight tunnel is wholly located on a steady <u>1 in 60</u> falling gradient. It's approach cutting, starting about 200 m away (nearer to 'Tunnel' Station) begins this same falling gradient towards the tunnel's higher portal.
The main problem here is not what leaks into the tunnel from the ground above it, but much of the water that falls around this higher approach to the tunnel, ends up following the track downhill into the tunnel. Dense vegetation growing on the natural surfaces and batter-slopes of this uphill cutting, effectively traps some of the water, and moderates the remaining flow-rates down the slopes into the cutting's track area. Unfortunately this track's side drains have been deliberately filled-in by earth (presumably by a Rail authority wanting to drive rubber tyred maintenance vehicles down to the tunnel portal, then reversing back over it). Through this cutting it looks much like an unsealed street 'Tram track' road surface. This long near-planar earthen surface would cause higher peak flow-rates towards the tunnel entrance after a storm, and probably carry some mud in with it.

However, historically there seems to be no evidence of any significant damage to the mainly timber-sleepered track inside the tunnel. There have been a couple of attempts to put pipes and concrete gutters to direct the main water-flow along one side. These attempts have apparently failed and are no longer maintained, so it appears they are not really necessary.

<u>Possible Future Enquiries</u>:

1. <u>Reduction of Tunnel's External Inflow</u>.
   It should be easy to explore the concept of adding narrow cut off drains along both sides of the upstream cutting, starting from points located wide and high above the tunnel entrance, then falling gradually along both cutting faces, eventually leading down to discharge <u>awa</u>y from the railway, near the Station end of the cutting. This would interrupt the two flows of water presently flowing down from the cutting faces onto the track area. The bench-drains cut into the faces of the cuttings would only need to be wide enough to support a small excavator. This might possibly capture and redirect up to about half the water running down the cutting faces, significantly reducing inflow at the tunnel portal. TasRail may have already considered / studied this concept.

2. Removal or Replacement of earthen track-fill with porous material. In the interests of inspecting and preserving sleeper life it through this cutting it would be best to completely remove this in-fill material (by using rail-based maintenance vehicles). If necessary to fill the track area for rubber-tyred access, better to use a course porous stone (eg small-sized railway ballast).

Footnote: Bob Vanselow has some indirect experience with shallow water running constantly through a long railway tunnel (approx. 500 metres) in WA's Pilbara region. The water-flow ran for nearly a full year, due to an allusive, distant burst water-main. The water-flow caused no damage track or tunnel, and did not interfere with the railway's slow-speed operation of loading ore trains through the tunnel.

'Local Low Point' Bridge – Lilydale side of Goldconda Road, approaching Lilydale Falls.
This bridge is about 8 metres long and its main supporting structure of concrete abutments and steel beams is sound and fit-for-purpose. However, its existing ballasted-track-supporting timber deck and associated timber side-kerbs, are failing and need to be replaced by about 14 evenly spaced pre-cast concrete transoms fixed to the main steel beams. The finished (ballast-less) track's rails will be resiliently fastened onto every transom.
The 'On Track' report cost is $3,000 *(need to ask Chris Martin for cost of Concrete Transoms).*

a. **'Local Low Point' (22.6 km) 9747,**

b. This bridge is the shortest on this railway, being a single span of about 8 metres. It is not equipped with Guard Rails. The bridge is of the 'ballasted track over timber-deck' type, and accordingly has problems with rotting timber decking and side-kerbs, causing ballast losses and, consequently, a poorly supported track skeleton. However, beneath its failing decking, its main steel box-girder structure and supporting concrete abutments appear to be structurally sound. Again, **a Transom-top <u>ballast-free</u> track structure, similar to the 1987 rebuild of Greeta's "Lisle Creek" bridge** (45.8 km)**, is recommended for this bridge's form of track-support.** One secondary issue warranting consideration: The shortness of this bridge will require either some <u>lowering</u> of the adjoining track approaches (possibly undesirable for peak flood events, but operationally tolerable due to the 40 km/h speed limit already applying close by). Alternatively, increasing the effective cross-sectional depth of the bridge's track-transoms *(possibly by robust packing),* rail levels could match <u>existing</u>. **9748**


9743

Level Crossings:

The Raylink report states the cost of each crossing to be $300,000. This is the accepted cost using commercial suppliers.

After the Scottsdale line's train services ceased operating, Tasrail removed its actively protected level crossing lights and associated electrical control equipment for safekeeping. It would seem to be reasonable that this infrastructure should be replaced.

The pre-existing track circuits, which were used to detect trains, are still in the track. If it is decided to use these, and they need to be repaired or upgraded, LNER would purchase second hand equipment from the mainland and refurbish them. However, when considering the relatively infrequent nature of its proposed lighter-weight railcar services, particularly during Stage 1, LNER would be concerned about the ability of track-circuits to reliably detect a train's presence. Factors such as rusty rails, leaves on the track, or sand applied onto the rails by locomotives having wheel-slip problems, can (and occasionally do) cause trains to go undetected by track circuits. Other problems with <u>track-circuits</u> relate to the need to insulate the rails from all steel sleepers (which are only going to increase in number), and the need to extend the lengths of all track-circuits to suit the additional warning time required for the Advance Warning Lights being proposed for all of these Actively Protected Level Crossings.
Accordingly we would prefer to use a more reliable technology for train-detection, such as <u>Radar</u> (post-mounted beside the approach and departure tracks for both train directions), which does not require any track circuits, is reasonably priced, and does not rely on every train driver's actions. Another Australian heritage operation uses an on-board <u>Remote Control</u> system to activate and de-activate the level crossing protection equipment, relying on the train driver to push the appropriate buttons at the right locations. Another suitable technology uses <u>Axle Counters</u> mounted at low level beside the track, but this is more appropriate for high speed operations, making it much more expensive.

Solar panels will charge batteries that power each crossing's operating mechanism and all its flashing lights. The recommended Radar-based control system would be appropriately priced and offer increased safety, with more reliably than any sort of track-based control system. The system will include an advisory 'healthy-state' signal directed towards the approaching train. If the crossing-lights are flashing it sends a white strobe light down the track, so advising the train driver that the flashing lights are all operating properly.

Boom gates are not used on other heritage railways. Advance Warning Lights may be required by the road authority.

24.1 km Highway B 81 (Golconda Road) beyond Lilydale Falls. **9693,**


Looking towards Lilydale Falls.

Why advance warning lights are required.

Bob V's experience in Western Australia – going back to the early 1980's – Hamersley Iron, who owns its own heavy-haul railway from its iron ore mines located hundreds of kilometres inland, had trouble with the main North West Coastal Highway near Karratha (located on the coast). Road trains with three loaded trailers were unable to stop in time on their approach to the level crossing, so they would deliberately 'speed across' the railway, and in so doing, collided with and destroyed the boom-barriers, rather than risk braking too late then colliding heavily with the train itself. The fast moving trucks were destroying the boom-barriers just ahead of the train's passage through the crossing. Working with WA's Main Roads Department, we discovered that, under bright sunlight, the truck drivers could not properly see the incandescent red flashing lights at the crossing early enough to safely stop before reaching the boom-barrier. There were frequent accidents where the boom-barriers had to be replaced – this was an inherent fault that needed to be addressed. Main Roads had already developed these Advance Warning Lights for use in the Perth area, where road traffic signals located around a corner or over the crest of the hill, were often being 'run through' by heavy trucks that couldn't stop in time.

The WA Main Roads Department and Hamersley Iron (part of Rio Tinto) decided to install these Advance Warning Lights on the approaches to this level crossing. Immediately the problem was solved – no more broken boom barriers, and a lot of happier truck and train drivers.

Other recent improvements to many Actively Protected Level Crossings, include:

1. The new LED lights in the (Yellow) Advance Warning Lights and the (Red) Flashing Lights at the crossing itself, have a much brighter light and this is definitely the way to go. The new lights can be fitted to existing equipment.
2. A white laser 'tell tale' light is directed back towards the train driver to let him know that the crossing's flashing lights are operating.

Warning lights on the train – especially important for Passively Protected Level Crossings Relying on "Give Way" or "STOP – Look for trains" Signs, alone.
On the railcar or passenger train itself, to have LED chasing lights fitted up-high along both sides of the railcar or the passenger train's locomotive. These 'chasing' lights are linked into the speed of the rail car. Its success relies on the motorist's / truck driver's peripheral vision. If the train is travelling at the same speed as you are there is no sense that there is anything moving. Bob V has suggested that LNER fit this feature to both sides of the railcar and the passenger train's locomotives. The 'chasing' lights on the rail car ensure that it will be noticed by a motorist approaching the level crossing at right angles, by making the train appear to be moving twice as fast as it really is, so triggering the motorist's / truck driver's peripheral vision, warning that the train is crossing his/her field of view, so brake to a STOP before you collide with it at the level crossing.

It is strongly recommended that an extra **Actively Protected** Level Crossing be included at **Bacala Road** as it is a long straight stretch of road (at 100km/h) with heavy log trucks travelling at speed. There would be no existing cables connected to this level crossing's track, so this could be a cost that might need to be included.

Level crossing protection systems that comply with the current standards:

In every state on the mainland, all the highways have reduced speed limit to 80km/h around railway crossings whether they are Passive or Actively Protected. It is usually a large **80** sign followed by a smaller one. Quite often they are doubled up on the opposite side of the road i.e. 8 x 80km/h speed limit signs per crossing. Logic is that traffic lights in 100km/h road will not be noticed. Level crossing warning lights are a form of traffic light. It is there to slow motorists down to 80km/h to ensure they see the level crossing warning signs or flashing lights and respond accordingly.

Washaway at Bacala

Uphill from Tunnel station 200mtrs. The drainage has not been built properly. floodwaters have pushed the ballast out from between the sleepers. This has allowed the track to buckle. The culvert needs to be rebuilt but the expertise and experience of the LNER group would enable this to be achieved. It needs to be backfilled with cement stabilised sand to prevent any further wash away. and needs to be realigned. This can easily be done with an excavator and volunteer labour . ($1,500 was included in the 'On Track' report for these works).
See Photo's: 9652, 9638. 9637 words (below).

Below: Inlet-**rocks** encouraging ***'piping'***. **9638**

…causing Formation collapse,

9652 … & ballast Wash-out & Track Buckle, and

ATTACHMENT B

CM Media Release

Association of Tourist & Heritage Rail Australia Inc
ABN 19 755 744868

To the Tasmanian Public

The announcement last week that the North East Railway Proposal has in part been approved shows that the Tasmanian government is being misled in its ambition to keep all parties happy. While it is pleasing that the government has given the go ahead for a segment of the line allowing trains ultimately to travel from Launceston (Tasrail permitting) to Lilydale Falls - the decision to approve rail removal through the 800m Tunnel at Tunnel and through the scenic Dennison Gorge is very short-sighted – all so that the Dorset Council can keep a $1.45million grant (the equivalent of a house in Melbourne!). I might add that this grant was originally the Federal Government contribution towards the project to build a bike track from Scottsdale to Launceston – a project which, with this announcement, has been reduced to a bike track from Scottsdale to Lilydale. I ask how many Federal grants have the scope of works significantly altered with no change to the funding amount!

The decision seems to have been made on the basis that Treasury assessed the two projects and chose the best economic outcome. How can a privately funded volunteer railway, with no cost to government, and ultimately paid staff attracting thousands of international tourists (of all ages and abilities) to the region compare to a publicly funded (Dorset ratepayers and Federal grant money) bike track used by a few cyclists on fine weather days. This project is not the same as the Derby Mountain Bike Tracks in its appeal. The community will have a white elephant like the current bike track from Scottsdale to the Billy Cock which, by all reports, is rarely used.

The Government despite the wishes of the broader community and despite the promise of engagement has used the back door process of treasury bureaucrats to produce a secretive and selective report. Having seen the report it would appear the economists/government are scared to back tourist rail all the way because it might cost government money when none has been asked for. Solution – spend $4mill of public money including 10% of Dorset Councils annual income for the reduced length bike path!

The North East Railway infrastructure and proposal has been given a glowing report by the Tasmanian Government commissioned Linquage report and the Societies highly regarded rail engineer – Bob Vanselow and past Tasrail lead track ganger Wayne Venn have all confirmed that the rail infrastructure can still be an asset to the Tasmanian community as a tourist attraction. This line has 30% low maintenance steel sleepers, predominantly concrete and steel substructure bridges (timber decks need replacing only) and is in better condition than any other scenic rail line that has ever been made available to the tourist rail sector in the country.

The North East Rail project obtained input towards a business plan from past Puffing Billy and West Coast Wilderness Railway General Manager Eamonn Seddon who outlined that the Lilydale to Dension Gorge segment is the segment with the most tourism appeal and recommended that this be stage 1 of the reopening program. During Tasmania's era of passenger trains the Denison Gorge was a popular destination for Launceston residents taking a day trip for a picnic to enjoy the scenic waterfalls and surrounds.

It is hard to listen Dorset Mayor Greg Howard continue to promote that tourist railways doesn't make any money as a reason to nock a rail project. As chairman of the Association of Tourist and Heritage Rail Australia – the peak industry body for the 74 tourist railways across Australia, I point out that all of these projects, by their nature are not for profits – reinvesting in their project not providing cash dividends to investors. The social dividends are however huge in areas such as: – history conservation; men's shed – teams working together; skills development and training; development of community leaders; marketing the region to attract people on the train (from their own revenue) and attracting the higher yield international tourists to their attractions. It doesn't make any sense to destroy a good asset giving the above opportunities to make way for the lower yield bike track proposal.

I am only too aware of the huge community efforts needed to get a railway up and running and to keep it running. Many people don't comprehend the complexity of it – yet strong, well lead communities have, and always will find a way to make these projects happen. Their development is often misunderstood by politicians and those making decisions with no understanding of the capacity of volunteerism in that they develop opportunistically, without a conventional cost benefit analysis business plan.

We should be asking all our federal representatives coming up to an election whether they believe that the trashing of our heritage and disrespect for local communities is what they stand for, all for less than 30 pieces of silver.

The short sightedness of the government approach is breathtaking in the context of the capacity of the rail network to provide the connectivity between the growing range of tourism opportunities across the region as well as providing sustainable employment well into the future.

The significance of the rail experience incorporating the tunnel and the Denison Gorge and perhaps ultimately Scottsdale should not be lost - all for the rush to spend $1.45 mill before December 2019. The community will lose so much more than the $1.45mill if the current direction is upheld**. I strongly urge the people of this state to consider a scenario which supports a stay of execution on the remainder of the North East railway. Give the fledgling North East Railway Project 10 years to get the section from Turners Marsh to Lilydale operable at no cost to government. At the end of this period, or before If they can move onto development of the next stage through the Tunnel to the Denison Gorge, re-assess the future of the remaining corridor which still has viable railway track in it.** If, as the Mayor of Dorset predicts, the project is too hard for today's community to achieve, then I say – pull the lines up then for the bike track! I am sure that, if the bike track project is as good as the Treasury report must say it is now, – then there will be plenty of tax payer funds to build the bike path then. **The low community yield bike path option should only be progressed when the high yield railway project option has been exhausted.**

Regards

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