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LIGHT RALWAYS

Australia's Magazine of Industrial & Narrow Gauge Railways



Light Railway Research Society of Australia Inc.



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Imperial to metric conversions:

1 inch (in)	25.40 millimetres
1 foot (ft)	0.30 metre
1 yard (yd)	0.91 metre
1 chain	20.11 metres
1 mile	1.60 kilometres
1 ton	1.01 tonnes
1 pound (lb)	0.454 kilogram
1 acre	0.4 hectare
1 horsepower (hp)	746 Watts
1 gallon	4.536 litres
1 cubic yard	0.765 cubic metres
1 super foot	0.00236 cubic metre
(sawn timber)	



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Editorial

A highlight of last year was the announcement on 27 October that Mike McCarthy's *In the Shadow of the Prom* had won the 2021 History Publication Award recognising the best non-fiction publication on Victorian history. To say that I was ecstatic is no understatement.

What makes this award so special from the LRRSA's viewpoint is that it is the first time a book published by the Society has been recognised by professional historians as the best when compared to other history books, some of which were produced by much better known publishers.

The judging panel were professional historians, who – in their comments – said that the book 'represents community history at its best'. (The comments in full can be read in LR 282, page 29).

It seems to have taken a long time for this recognition to come. Many of us have felt that there has been a prejudice against technical histories amongst professional historians. They may have seen technical history as a niche area of limited interest, and any publisher with the word 'railway' in their name must be a technical publisher!

By their nature it is difficult to separate tramways from their environment. They affected how people lived, and in many cases allowed townships to develop which otherwise would never have existed. Like many of the LRRSA's books, and articles published in *Light Railways, In the Shadow of the Prom* is much more than a technical history. It is very much a social, and economic history.

Frank Stamford

Front Cover: 'Hellfire Corner' at Red Cliffs c1928. The corner was notorious for derailments because of the finely tuned approach needed to climb the grade beyond the corner. Too fast and trucks could scatter across the road; too slow and the loco would not get to the top of the hill. Hard braking would see the worst of all possibilities; trucks would stack up like a pack of cards held vertical by the spilled coal. In this image the train has stopped whilst the guard checks that all is well towards the rear of the rake. Photo: J Dean (colouring auto and by M McCarthy)



Light Railway Research Society of Australia Inc. A14384U PO Box 21 Surrey Hills Vic 3127 www.lrrsa.org.au

The Light Railway Research Society of Australia Inc. was formed in 1961 and caters for those interested in all facets of industrial, private, tourist and narrow gauge railways in this country and its offshore territories, past and present. Members are actively involved in researching light railways in libraries and archives, interviewing knowledgeable

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The Red Cliffs Pumping Station light railway

by Mike McCarthy

The dry Mallee country in the vicinity of present-day Mildura, 475 km north-west of Melbourne, has good sandy soil but, in early times, an absence of adequate rainfall meant that it was of little use for farming. This was to change in the mid-1880s when Alfred Deakin, Victoria's Chief Secretary and Minister for Water Supply (and later to become Prime Minister of Australia), enticed the Chaffey brothers, originally from Canada but then resident in California, to bring their irrigation expertise to the region. Their scheme failed within a few years but from the detritus of the collapse rose the First Mildura Irrigation Trust. The trust represented the interests of growers who had obtained land through the Chaffeys' scheme but who were now potentially left literally high and dry by the scheme's failure. It had, as its prime goal, the supply of irrigation water to the farmers. Under the changed arrangements, irrigation prospered and the acreage under vines and other crops steadily grew. The advent of a government funded scheme, at nearby Merbein in 1909, expanded the acreage of irrigated land in the region.

In 1911 attention of government was drawn to the plight of settlers to the south of Irymple. Much of the land was under the control of the First Mildura Irrigation Trust. This area, known as Red Cliffs, had originally been the preferred location for the Chaffeys' pioneering efforts back in the 1880s. They went elsewhere because of the extreme height water would have had to be lifted from the Murray River to a channel that would take it to the farms. In 1911, however, it was not grape growing that was the goal. It was water for stock and domestic use in the area to the south, at Carwarp and Yatpool, that was needed. The quantity necessary was much lower than that demanded for the fruit blocks to the north. The area had been placed open for selection at the time the railway came through, but the hot dry summers threatened to force settlers off their land¹ while bore drilling found nothing but salt water.²

Water from the Murray

The State Rivers and Water Supply Commission (SR&WSC) was tasked with providing a solution and chose to install a pumping plant on the Murray River (the Carwarp pump) with the intention to construct a channel to the south where settlers would be paid to construct their water storages or 'tanks'. The cost would be recovered from future water charges.³ By the end of 1915, the channel was completed, and the pump installed, but expectations were dashed when the pump could barely lift a dribble to the channel level. Clearly not much science had been employed in the technical design of the scheme. The boiler could produce nowhere near sufficient steam to keep the pump working.⁴

A month later a second boiler was installed, and water was sent southwards, but after a week or so of work, it could not reach closer than eight kilometres from Carwarp. Seepage in the sandy soil had defeated the efforts of the pump. The plant (disparagingly referred to as a 'tea kettle') was doubled in size later in the year and flow improved but still failed to reach the full length of the channel system. The locals referred to the whole scheme as a 'botch'.⁵



Kerr Stuart b/n 742 paused alongside Pumps Road on the way to Red Cliffs, probably in the late 1930s. The original lining has faded but is discernible. The driver is dressed for work on a hot machine and is seated to catch the breeze on what was likely a hot day. Photo: L.G. Poole

The following three years saw little done. Of course, attention was by then focused upon the war in Europe and, indeed, many of the settlers in the region had enlisted for the fight. However, the end of the war in 1918 brought the whole scheme into a much broader context. A need to reinvigorate and refocus an economy away from wartime effort towards growth and employment saw massive investments in public works. This included the Murray River water scheme which encompassed what became the Hume Weir, and related projects such as the Torrumbarry Weir project. The scheme aimed to supply yearlong access to water for domestic, stock and irrigation use which would make possible the opening of great swathes of land for settlement and farming. This was especially important because of the need to find employment for thousands of returned soldiers.

As dismal as the results of efforts at Red Cliffs had been there was absolutely no doubt about the validity of the goals. The opportunity now arose to kill two birds with the one stone. The farmers of Carwarp and Yatpool could be given the water they needed but, with the public investment available, much more could be achieved. The land that the Chaffeys had originally wanted to use for irrigated agriculture could now be developed into fruit blocks to service local and export markets through a scheme that would provide returned soldiers with land they could farm. In complete contrast to the earlier efforts where mostly cheap second-hand equipment was sourced to pump the water, now, no expense was to be spared in creating an irrigation system designed to succeed. A massive expansion of the pumping capacity at Red Cliffs, at a new site two kilometres north of the Carwarp pump, would remove any doubt about a reliable supply of water, and concrete lining of channels would deal with the seepage problem.

At the end of 1919, the Government announced its intention to purchase 33,000 acres from the First Mildura Irrigation Trust, of which 15,000 acres would be served by irrigation.⁶ A survey had established that up to 1000 returned soldier settlers could be provided with 10 to 15-acre allotments to be developed as fruit blocks. A town, to be named Red Cliffs, was to be created to service the needs of the settlers.



Also, at long last, some solid analysis was brought to bear on the pumping capacity required. Three pumps would be installed. Two would be steam turbine driven centrifugal pumps while the third would be a triple expansion, reciprocating steam engine driven centrifugal pump.⁷ Six Rees patent water-tube boilers would provide the steam. Combined, the plant would be able to produce 3,950 bhp and would form the most powerful pumping plant, not only in Victoria but the southern hemisphere, to that time. It was designed to lift 500-acre feet of water from the river to the top of the rising main and into the main channel each day.⁸

Around the middle of 1920 an order for two 48-inch pumps was placed with Weymouth Limited, to be powered by 1600 bhp steam turbines built by Thompsons and Co (Castlemaine) Pty Ltd, who proposed to manufacture the equipment to a MetropolitanVickers Ltd (UK) design. A third smaller 36-inch centrifugal pump, driven by a triple-expansion steam engine, was ordered from Thompsons around the same time. The six boilers, to be fuelled by firewood harvested from the clearing of settlers' blocks and from riverside forests, would be provided by H.B. Hawke & Co, of Kapunda in South Australia.⁹ The appointment of an Engineer-In-Charge followed. The role incorporated managing the erection of the plant and, its on-going operation and maintenance.¹⁰

By September 1921, the triple-expansion steam engine and pump were in position and were successfully tested early the following month.¹¹ Work progressed rapidly towards having it in operation by October, and in January 1922, Victoria's Premier, Harry Lawson, joined by 50 members of State Parliament and "hundreds of 'diggers' with their wives and children", declared the pump open. The new pump meant the Carwarp pump could be decommissioned and its supply channel, to the edge of the new irrigation area, could be backfilled, and its land released for fruit blocks.¹²

At this time, 150 blocks were being supplied with water, and 9,730 acres of the planned 15,000 acres had been cleared of scrub. The work associated with clearing was done by the settlers who were, in turn, paid by the Government to do it. As with the earlier scheme, future water charges were to recover the cost.¹³

The following August the second turbine driven pump was brought into operation and by October a further triple expansion engine, direct coupled to an alternator, had commenced operating. It was joined by a second alternator in 1923 and combined they generated the 355 kw of electricity needed to power three sub-pumping stations on the channel network.¹⁴ The use of electricity and not steam to run these 're-lift' pumps was to have a profound impact on the future of the facility in a way the planners could never have imagined. But as it existed in 1921, it was certainly a far cry from that originally installed to service the Yatpool farmers.¹⁵

The light railway

But not all was well. In November 1922, the wood stokers and stackers went out on strike complaining of over-work and the need for another stacker. The Red Cliffs fruit growers threw themselves into the task to keep the pumps going until the matter was resolved.¹⁶ The dispute, however, brought focus to the fuel supply which by then was depleting rapidly. Over 1923, the concern grew, with the Red Gum forests along the Murray becoming increasingly more important as a fuel source as opposed to the block clearing activity. The rising costs and worry about forest conservation led to an announcement in December 1923 that wood fuel was to be replaced by coal.¹⁷

Mechanical stokers and an overhead coal feeder were to be installed in the boiler house with the coal to come from



either Wonthaggi or Newcastle. Perhaps displaying some of the nervousness about coal supplies that was prevalent in the era, the conversion work was to allow the boilers to be converted back to wood fuel with two to three days' notice.¹⁸ Furthermore, the coal was to be brought from the railway at Red Cliffs by a light railway or tramway, over a distance of five kilometres.

The planning and survey work for this had been underway for some months prior to the announcement, with four routes under consideration.¹⁹ There were three criteria applied to the choice of the route; it could not pass through the town of Red Cliffs, the Victorian Railways siding serving the line had to be away from town, and there was to be a minimum curve radius of three chains.²⁰

The easy grades from the railway to the pumping station, no matter which alignment was selected, should have made a choice about the route simple. However, the shortest and by far least expensive route could not be chosen at first because of the minimum radius that was to apply on curves. Nevertheless, the cost differential between the three compliant routes, each of which involved substantial property purchases, and the fourth, which involved none, was such that, ultimately, the minimum radius requirement was abandoned. The fourth alternative was selected. It was the shortest of the choices and publicly owned land could be used over the entire path by following the side of 14D channel, and then what became Pumps Road. There would also be no need for a tramway licence because no Crown Land was traversed. This may have been the reason why it was always referred to by the SR&WSC as a 'light railway'. No point in getting the Lands Department involved and risk paying a tramway licence fee.

Along this route the steepest grade against the load heading towards the pumping station was to be 1 in 95, but with an average down grade of 1 in 62. On the face of it, an easy task for a locomotive with the toughest job being the haulage of empty trucks back to the siding. In reality, it would be anything but easy given the route followed a road alignment with grades and curves that would have been avoided had a specifically surveyed light railway alignment been chosen.²¹ This was to afford some significant challenges for crews working the railway.

The locomotive

In January 1924, tenders were called for a "new or superior second-hand" locomotive. Two-foot gauge was specified as was the maximum allowable weight of seven tons. Fourteen locomotives were offered to the Commission with most being new units from overseas manufacturers. The shortlist was led by the offering of a second-hand Krauss locomotive from Cameron, Sutherland Seward Pty Ltd of Melbourne on behalf of the Mount Lyell Mining and Railway Company in Tasmania. It was builder's number 3729 of 1897,²² and was in good condition but somewhat aged.²³ The other tender finalists were eliminated because of cost. However, from the sidelines came a late offer from the South Australian Irrigation Commission.

The Commission advised that they had two locomotives available, having been briefly in use on the Cobdogla to Loveday light railway from 1922 to early in 1923 when operations ceased.²⁴ The larger of the two was built by Kerr, Stuart and Company Ltd, builder's number 742 of 1901, weighing 10½ tons, while the smaller was the four-ton, W.G. Bagnall Ltd, builder's number 1801 of 1907.²⁵ Both were in particularly good condition although the wheel flanges on the Kerr Stuart were well worn.²⁶

Despite its weight the Kerr Stuart was chosen, and it came with a spare set of driving wheels in addition to other components. It represented good value to the SR&WSC. The price was \pounds 750, marginally more than the Tasmanian Krauss, but it was only a river journey away and the SR&WSC quickly agreed to its purchase.

The locomotive was of Kerr Stuart's 'Skylark' class and was of 0-4-2 configuration. It was sold to T.A. Martin & Co in February 1901 for use in India where it was named *Lukee*. It was returned to Kerr Stuart in August 1903 and rebuilt. In 1904, the locomotive was sold to British Zeehan Silver Mining Company at Zeehan, Tasmania. Here it worked until 1913 as *Spray*.²⁷ It sat out of use until bought by the South Australian Irrigation Commission and moved to Cobdogla in 1922.²⁸ It was not formally named whilst at Cobdogla.

The Kerr Stuart arrived at Red Cliffs in late March 1924, having left Cobdogla on the 20th. Dismantled into its major components, the locomotive was loaded onto a barge and hauled by the paddle steamer, *Renmark*,²⁹ to, presumably, Mildura. The SR&WSC lock 11 worksite there was equipped with riverside heavy lifting equipment whereas none was available at Red Cliffs. From Mildura it was likely sent by rail to Red Cliffs as there was a railway siding available at the Lock 11 worksite. A photograph taken soon after its arrival at the pumping station shows what appears to be a heavy-duty low wagon in the background which may have been used to carry the locomotive components.³⁰

Concurrent with the purchase of a locomotive, the Commission called tenders for the other equipment and materials needed to construct the light railway and put it into operation. Sixty-five side-tipping skips were required and were duly ordered new from GF Sewell Pty Ltd³¹ of Footscray after an offer of 20 trucks from the South Australian Irrigation Commission was rejected. They were of ³/₄ cubic yard capacity and were of the same ubiquitous outside framed design as used on many two-foot gauge industrial tramways throughout Australia and overseas.

Some rails for the railway, described as 'new', also came from the South Australian Irrigation Commission and were possibly those which had been intended to be used on the proposed Barmera branch of the Cobdogla to Loveday light railway.³² The balance was supplied by BHP, Newcastle.

Tenders for the supply of 10,000 sleepers, each four feet in



Having been unloaded onto the ground by use of the pumping station gantry crane, the Kerr Stuart locomotive has just arrived from, most probably, Mildura. It had been despatched from Cobdogla in South Australia aboard a barge behind the paddle steamer Renmark in late March 1924. Photo: State Library of Victoria



In late March/early April 1924, the small Kerr Stuart locomotive arrived at Red Cliffs in a dismantled state from Cobdogla in South Australia. It is pictured here, fully assembled, sitting on wooden rails with what appears to be the heavy wagon upon the components travelled visible to the locomotive's rear. It was to remain here until the light railway was extended to the pumping station four months later.

Photo: State Library of Victoria, Rural Water Collection

length, were sought, with Arbuthnot's Redgum Sawmills of Koondrook successful. Eighteen sets of points and crossings, as well as one 'symmetrical two-way turnout', were purchased from Cameron, Sutherland Seward Pty Ltd.³³

Construction work on the railway was intended to start during April 1924,³⁴ however delays in receiving the sleepers from the Koondrook sawmill postponed commencement until June.³⁵ Once work began, the largely featureless countryside allowed rapid progress. Most of the labour employed came from the returned soldiers taking up blocks in the Soldier Settlement Scheme.³⁶ The first coal was hauled over the mostly completed light railway on Monday, 28 July 1924. The locomotive had arrived at the pumping station by this time but could not start work until the rails had reached the terminus. Consequently, horses hauled the first load, as far as the then terminus, a short distance from the pumping station.³⁷





The only known image of the coal bins and Harman grab crane at the Red Cliffs siding. It was not successful, possibly because of coal jamming in the chutes. The presence of a mound of ash covering the track beneath the crane suggests that the bins, at least, were out of use at this time. No evidence has been found suggesting that the bins were in use beyond the first year of operation. Photo: Red Cliffs and District Historical Society

SR&WSC Red Cliffs siding

The Victorian Railways (VR) railway siding serving the narrow-gauge railway, officially named State Rivers and Water Supply Commission Siding, and located some 350 metres north of Red Cliffs railway station, opened on 15 July 1924.³⁸ It consisted of two tracks, one for full trucks and the other for empties. An extension of the empties line allowed for shunting without disturbing the main line. A return connection onto the mainline was provided at the Mildura end. The station (and its goods sidings) and the SR&WSC siding, though separated by the Fitzroy Street level crossing, were all worked as being part of Red Cliffs railway yards.

At the outset, light railway and coal transhipment arrangements at Red Cliffs were comprehensive. Two lines of narrow-gauge trackage allowed differing methods of loading the trucks, depending on the circumstances, and a third permitted locomotive movements and shunting.

The middle line was straddled by a steel and wooden coal bin, and a rotating grab crane on a platform. The grab crane, manufactured by Alfred Harman of Port Melbourne, lifted coal from railway trucks and placed it in the bin. Manually placed trucks were loaded utilising five chutes beneath the bin. Coal deliveries by the VR were sized and timed so as not to overtax the coal bin's capacity.³⁹

Between the hopper line and the railway was another line of narrow-gauge rails which allowed the direct loading of skips by the Harman grab crane or by the hand-shovelling of coal from the VR trucks into the narrow-gauge skips. The latter capability was clearly necessary to allow the coal traffic to continue on the occasions when the Harman grab crane was unavailable. The siding arrangements were designed to ensure a continuous feed of coal to the pumping station using two rakes of skips.

On the approach neck leading to a wye at the Red Cliffs terminus sat two sidings, one each side of the main line. These were the arrival and departure sidings. Empty rakes would be left here, and full rakes would be collected for passage through to the pumping station.

The narrow-gauge sidings were graded to make use of

gravity in the movement of loaded trucks. Empty skips would be shunted from the arrival siding around the southern leg of the wye to enter the loading sidings. The locomotive would then reverse the trucks onto whichever line was to be used for loading.

In early times, the locomotive was used to progressively push the trucks through the loading procedure (except for manual spotting of skips under the chutes of the bin) and then to take the loaded trucks out along the northern leg of the wye to the departure siding. Once all loaded trucks had been assembled, they would be hauled back to the pumping station. This meant that only two rakes of trucks were needed to work the railway.

The use of the grab crane and coal bin at Red Cliffs was short lived and, likely, did not stretch beyond the first year or so. The reason for this can only be speculation, but the size of the coal lumps in early views of loaded skips would seem to suggest that difficulty in passing the large chunks through the chutes would likely have been a problem. The only image found of the bins shows them apparently out of use. With the coal bin operation abandoned, the hand shovelling of coal from broad gauge trucks into the skips alongside became the norm.

The pumping station

The boilers at the pumping station were planned to operate at full capacity only during periods when irrigation of crops at Red Cliffs was needed or when the Carwarp/Yatpool pumping was underway; the latter usually occurring for three weeks before the first irrigation of the Red Cliffs season. At other times, the pumps would be idle. Most years the pumps did not work between April and August.⁴⁰ In 1924 the annual coal requirement was 7200 tons⁴¹ which required around 290 train journeys annually to service.

At the beginning it was envisaged that coal would mostly be delivered direct to the coal bins above and behind each boiler with minimum yard storage at the pumping station. A relatively small emergency supply of coal was all that was to be kept. The pumping station trackwork and associated structures reflected this objective, and all was organised with efficiency and a minimum of manual handling in mind.





An early view of the pumping station during the days when six boilers were all that were needed to drive what were then steam driven turbine pumps. The image showcases the craftmanship employed in constructing the 156 ft (47.5m) high chimney. A short rake of empty trucks sits atop the trestle bridging that crosses the rising main. Other trucks will be manhandled to join them and, later, all will be collected by the Kerr Stuart locomotive. The positioning of the trucks reflects the fact that the locomotive was not allowed onto the trestles due to its weight. Note the power lines carrying electricity to the three re-lift pumps. Lump coal in the trucks at far left suggests a timing c1928. Photo: State Library of Victoria, Rural Water Collection

On reaching the pumping station yard, the railway entered upon trestlework to cross the rising water main, and then progressed 73 metres, on an open framed platform to the tipping point at the coal chute. This was located at the northern end of the boiler house. Over this section, the railway divided into two tracks, forming a loop. The northern-most track incorporated a weighbridge and was the arrival line for full skips whilst the other was for empties awaiting return to the Red Cliffs rail siding.

Two coal storage tracks, also raised on trestlework, diverged from the arrival line and curved to run parallel to the arrival and departure sidings. These were 30 feet apart and were nominally 8 feet high. The trestles were 12 feet apart. The open deck allowed the coal to be tipped onto the ground below. At times, the trestles would disappear beneath the pile of tipped coal giving the appearance that the track was carried on a coal embankment. In 1925 a large reserve coal bunker, served by manually worked coal retrieval tramlines, was built beneath the southern-most of these sidings.⁴²

Originally there were to be two bunkers but the second was never built. The SR&WSC came to the belief that by introducing a third returned journey on the railway a day there would be less of a need to store coal at the pumping station. For this reason, the second bunker never materialised and the siding that was to serve it was truncated. It is also possible that the failure of the loading bin over the light railway at Red Cliffs suggested that this form of storage was impractical. The bunker featured five chutes on each side which allowed hand-worked trucks positioned below to be filled by gravity. It is easy to imagine that jamming would be a problem. It was removed within a year or two.⁴³

Unreliability in coal deliveries due to industrial action at both the Wonthaggi and Newcastle mines coupled with the desire to keep coal from each source separated, because of differing calorific values, soon led to an expansion of the pumping station coal dump. This was aimed at not only achieving the desired separation, but also to increase the volume of reserved coal to offset the delivery reliability risk. A further pair of sidings was extended towards the north of the dump from around 1928.⁴⁴ The western-most line was used for Wonthaggi coal while the other was reserved for Newcastle coal.⁴⁵

Locomotive accommodation at the pumping station at the outset consisted of a shed 20 ft 5½ ins by 12 ft 8 ins with a 6 ft by 9 ft skillion attached. It was clad with corrugated iron and featured two side-opening, wooden panelled doors at each end.⁴⁶ Two smoke flues protruded from the roof and an engine pit was provided for maintenance of the Kerr Stuart. The shed sat on a loop from the main line.





Left: The coal dump c1928. In the right foreground sits the wooden coal bin which was to store the reserve supply of coal for the pumping station. There was to be a second bin at the end of the track behind it, but the plan was abandoned in favour of the coal sidings at the rear. The rails were carried on trestles through this area however they have been buried beneath the dumped coal. Newcastle coal sat on the right-hand side and Wonthaggi coal to the left. Photo: State Library of Victoria,

Rural Water Collection Below left: An interesting recorded image around September 1924, during the late construction period of the light railway. The original plan called for two coal sidings that would serve large coal bins. One of the sidings has been partially laid, however the trestlework for the other is still bereft of rails. The storage plan was abandoned within months and only one of the bins was built. Instead, two extra coal sidings were laid to the left, most likely in 1926, and a second coal elevator was erected to cater for the dumped *coal. The original coal elevator* and roof of the weighbridge office are visible on the right, next to the trackwork. In the background are the firewood stacks, which were held in standby at this time. Photo: State Library of Victoria,

Rural Water Collection



Coal retrieval tramways

The need to store coal grew over time and an expanded system of ground storage, making use of movable trackwork, was introduced at the pumping station.

The coal dumped off the storage trestles needed to be recovered and delivered to the coal crusher and elevator. Two-foot-gauge trackwork passed between and beside the storage trestles which allowed coal to be hand shovelled into skips. In early times these were hand pushed to a dump pit next to the coal crusher and a dedicated elevator. The elevator raised the coal to allow it to be dumped into the chute used by the tramway from Red Cliffs. Eight to ten shovelers were employed in the yard working on retrieving the coal.⁴⁷ A horse helped with the movement of the skips.⁴⁸

The lines of track wove around alongside the stacks and the bin. They were connected by points and turntables, and openings between trestles were kept clear in places to allow the passage of the retrieval trucks.

The system varied in configuration over time as the layout of the coal dump changed.

Ash disposal tramway

Another, independent, tramway system at the pumping station was associated with ash removal. Within the boiler building, ash skips were used to remove the waste from each of the boiler furnaces. The tramway ran beneath the rear of the boilers and the ash was then extracted at the northern end of the shed. A lift was used to bring skips to ground level where a small turntable directed them onto the disposal line.

The ash skips differed in design from those used for coal transport. They were of heavier construction, inside framed and of a lower capacity, possibly ½ cubic yard.⁴⁹

The skips were initially hand pushed from the boiler house to the spoil grounds beyond. Trackwork was movable to allow for the even disposal of the ash. With each expansion of the boiler house the ash disposal line was shifted and, as the disposal ground became choked, the tramway was realigned to a new area. By 1944, the ash disposal tramway had been extended for some 190 metres and at its outer extremity a winch was in use to pull the skips atop the pile for ash dispersal into the north-eastern corner of the pumping station grounds.

The quantity of ash produced varied markedly depending on the fuel in use.Yallourn briquettes were the most efficient with only a 1% ash residue. Newcastle coal left 10% of volume used as ash while Wonthaggi coal proved unpopular because of the 35% ash volume it left.⁵⁰ The popularity measure was from the viewpoint of the pumping station management; however, the Red Cliffs community took a different view. They knew when Wonthaggi coal was in use by the volume of clinker that became available for use on footpaths around homes and along streets in the town!

The journey to the Pumping Station

The challenge for the locomotive driver on the five-kilometre journey to the pumping station was not so much the haulage effort of the engine but more in keeping control of the train to enable safe passage through the many bends along the right-of-way. The railway followed the road for most of the distance and the grade, which on average was quite mild, was mostly in favour of the loaded train. Unlike most of the irrigated area in the region, the Red Cliffs blocks were arranged in sympathy with land contours. This meant that roads were meandering in direction as they curved their way around boundaries. This, of course, meant that the tramway did the same. Mostly this could be navigated with relative ease but changes of direction in quick succession and tight curves could lead to trouble. Such was the case at what is known locally as 'the Spider Web' where several road junctions were met in quick succession through which the railway was required to snake its way.



The coal elevator was a popular vantage point for taking photographs in the early years of pumping station operations. The dumping of coal off the fulls and empties lines informs us that the image dates from around 1926, before the raised sidings that extended to the upper reaches of the coal dump had come into operation. In the background, the track leading to the engine shed is visible. Note the shade roofing protecting the rising main from the effects of the hot summer sun. Photo: Photo: State Library of Victoria, Rural Water Collection



Kerr Stuart b/n 742 has just arrived at the pumping station and is preparing to uncouple, move forward and then reverse onto the loco shed track at the right. The wooden sprags used to hold the trucks on the grade can be seen protruding above several of the trucks. These will be removed to allow the trucks to coast forward onto the pumping station trestlework in preparation for unloading. Photo: E.J. 'Ted' Dean (colouring auto and by M McCarthy)

The section beyond the spider web featured a low embankment aimed at softening the impact of two short sections of down grade. However, at the end of this straight was a challenging point for drivers to negotiate. Appropriately named 'Hellfire Corner' by the crews, as it involved a sharp left turn onto the steepest rise on the railway, the 1 in 95 climb meant that the loaded train needed to gather momentum before the corner in order to negotiate the 350 metre long hill along with its sharp curve to the right at the top. It seems likely that it drew its name from the trenches of northern France where several of the crew had served.

Many a pile up of trucks occurred on this section when drivers misjudged their speed. An over enthusiastic approach to the first curve could send trucks off the line, spreading coal across the road, while sharp braking could result in disastrously concertinaed trucks. The former presented a major problem with significant delays to the day's operations while a crew was despatched from the pumping station to clean up the mess and put matters right. The latter, however, would be nothing short of catastrophic. With trucks, standing near-vertically, wheels to wheels and bin top to bin top, with spilled coal piled about them, the clean-up job was monstrous. The load had to be shovelled clear to free the trucks and allow them to be placed back on the rails. The coal would then have to be shovelled a second time to put it back where it belonged. Notably, such accidents were viewed differently depending on your perspective. Coal, and later briquettes, left over from accidents did not sit on the ground for long. On frosty mornings, the air about the houses along the route was usually tainted with the odour of coal or briquettes burning in fireplaces!⁵¹

Following Hellfire Corner there was an easing of the grade to 1 in 111, and the tramway was carried on a rising

embankment, the most significant on the line, bringing it up to the main channel crossing. Following this was the most challenging section of track on the light railway. A wellconstructed bridge, 16 metres in length, utilising steel girders, two steel supports and concrete abutments, took the line across the channel and onto a 1 in 43 down grade. The bridge, a long span with a low profile, helped to keep the grade to a minimum. Having crossed the bridge, the railway traversed the down grade for 240 metres. This was followed by a sharp left curve that had to be entered at pace in order to ascend a rising grade of 1 in 105. This, again, required care and skill to prevent disaster at the corner.

Beyond this, the light railway entered its own easement, and after an initial rise, the grade was level over the next 400 or so metres. At the outset, two loop sidings were planned in this section, but were never built. It seems they were intended to be the arrival and departure sidings for the pumping station with the 1 in 45 down grade beyond to be worked independently of the line from Red Cliffs. The locomotive would have run around the train before lowering the trucks, probably a half-rake at a time, over the remaining 500 metres, onto the trestles in the pumping station grounds. In practice, possibly because the over-weight Kerr Stuart was banned from travelling on the trestles, the locomotive would continue at the head of the train until reaching a spot above the points to the engine shed. Here, wooden sprags were inserted vertically into the track bed between several trucks to hold the load, as none of the skips were fitted with brakes. The locomotive would then be uncoupled, moved forward and then reversed onto the engine shed siding, out of the way. On removal of the sprags the trucks would coast down, roll around the curve, cross the rising main, and pass onto the trestlework.52



Derailments and mishaps occurred now and then on the light railway. This view appears to show such a scene after the clean-up has been finished. A damaged truck awaits collection by the pumping station truck and timbers used to assist with rerailing lie next to the rake of skips.

Photo: Norm Wadeson collection

In 1924, when operations began, two return trips over the railway were made daily, a normal load being 32 trucks.⁵³ This was designed to move around 50 tons of coal per day to the boilers within an eight-hour shift. A modified schedule that seems to have appeared within the first 12 months or so saw three return journeys introduced but with rakes reduced to 22 trucks.⁵⁴ In these early days it was Jack Gill who was the principal driver of the Kerr Stuart locomotive.⁵⁵

It was a period of experimentation aimed at achieving maximum efficiency, but the change may also have been partly the result of the loading bins at the Red Cliffs siding having proved a failure. Hand shovelling would have taken longer than the intended loading time using the grab crane and coal bins. This may have made the extra journey necessary to keep the men at the pumping station busy. At this time, it was very much a juggling act aimed at achieving the maximum quantity of coal moved in an eight-hour shift. Whilst at the siding, the locomotive would help with shunting.

Expansion

A 16 per cent expansion in area under irrigation over 1926 – 27 saw a commensurate increase in the pumping required during each period and, therefore, an increase in coal required. The added work would likely have meant running the pumps longer during the regular irrigations resulting in increased coal consumption. To facilitate this, 20 side-tipping trucks were transferred to Red Cliffs from the almost-completed Lock 11 project at Mildura in July 1927,⁵⁶ followed by another six the following year.⁵⁷ The first lot of trucks were accompanied by a small TACL, petrol-engined locomotive, no longer needed at Mildura, to speed up the unloading process at the pumping station, as well as to assist in working the planned expansion of the coal dump sidings. At Mildura the loco had been one of two delivered new from TACL in December 1924.⁵⁸

The extra trucks meant that longer rakes could now be assembled, allowing for a set to be in the process of being



A small TACL locomotive, powered by a Fordson Major engine, arrived at Red Cliffs in July 1927 to assist in working the expanded coal dump at the pumping station and the unloading process at the coal elevator. It had previously worked at the Lock 11 construction at Mildura and was the only locomotive allowed onto the trestlework. It operated at Red Cliffs until replaced by a small three-ton Malcolm Moore locomotive, most likely early in 1934. The TACL is seen here on the left protruding from the north end of the engine shed. Photo: Red Cliffs and District Historical Society



If there was a focal point for light railway/tramway operations at Red Cliffs pumping station, it was where coal was off-loaded. In this c1933 view, on the middle right is the coal crusher with the tipping point for the coal trucks above it. Coal would be tipped against the wooden barrier which directed it into the crusher. The crushed coal would pass to the left to be collected below ground by the elevator visible at the rear. In the foreground are the coal retrieval tramways. The trestlework on the left provided a connection to the briquette retrieval tramway system via a ramp. Briquettes were not crushed so a separate feed system was needed. This arrangement was in place from 1931 to 1943.

Photo: State Library of Victoria, Rural Water Collection

loaded at Red Cliffs, another unloading at the pumping station, whilst a third was in transit. For this to give advantage most of the shunting at the siding would need to have been done by hand by this time. This was a practice that was certainly the norm in the later years of operation.

At the pumping station the petrol locomotive would usually be used to push the trucks forward on the trestlework for unloading and for other movements around the coal dump.⁵⁹ Prior to its arrival, the work was done manually, although the Kerr Stuart locomotive was sometimes used to position trucks on the trestles, though with some difficulty. Empty trucks would be placed between the locomotive and the loaded trucks to enable the forward movement.⁶⁰ It seems that the introduction of the small TACL locomotive was aimed at ensuring that an empty rake was available for collection immediately after the locomotive arrived from the siding and had dropped off its train of full trucks. The earlier operation would likely have left workers at both ends waiting for rakes to arrive.

In 1928, concurrent with the provision of the two additional coal storage sidings, a second track was laid into the engine shed to accommodate the additional locomotive.⁶¹ To allow for this, the skillion attached to the shed was replaced by an extension on the north side.

Briquettes

The railway proved to be an efficient and reliable means of bringing coal to the pumping station over the early years of operation. However, the timely delivery of quality coal at an acceptable price to Red Cliffs siding was another matter.

The two main sources of fuel were the State Mine at Wonthaggi, and the Newcastle coal mines in New South Wales.

During the mid-to late-1920s, both became progressively more expensive, and delivery of Newcastle coal became increasingly unreliable as colliery closures and industrial action affected production.⁶² Delivery of coal from Wonthaggi was more reliable but its quality was comparatively poor.⁶³

The impact at Red Cliffs was quite threatening. The cost of fuel for the pumping station was ultimately met by the growers and, despite the extensive reserve of fuel kept at the pumping station, the reliability of delivery was, nevertheless, a concern.

For decades, the reliance of Victorian industry on coal from New South Wales presented a problem. Indeed, it was the policy of successive Victorian governments to reduce and possibly remove this dependence. An outcome of this strategy was the opening of the State Mine at Wonthaggi and the investment in briquette manufacture at Yallourn (and later Morwell). Conversion of brown coal into briquettes allowed its use as a fuel for the factories of Victoria.

The manufacture of briquettes at Yallourn began in 1925.⁶⁴ Demand outstripped supply from the start leading to high prices, but also massive increases in briquette production over a short period. It was the substantial increases in availability and lower pricing that came into effect in the period 1928 to 1931 that drew the attention of the SR&WSC. A study undertaken by the Commission in 1930⁶⁵ led to the conclusion that lower costs and greater certainty of supply would be achieved if a move were made to using briquettes as fuel for the Red Cliffs pumping station as opposed to coal. In November 1930, the decision was made to make the change and deliveries of briquettes started at once.⁶⁶ It seems that during this era locomotive driving duties on the railway passed to Les Williams.

Working day and night the necessary changes to accommodate briquettes were made over the last week of December 1930 so that all would be available for the next pumping period in early January.⁶⁷

The changes were principally concerned with increasing the draught feeding the pumping station boiler fires and providing a feed system that bypassed the coal crusher.⁶⁸ A ramp was constructed leading to a separate dump bin for briquettes from the east side and the tramway at the dump point was extended down this ramp to make a connection with the retrieval tramways at ground level. The grade of the ramp and photographic evidence of rope lying along it would suggest that trucks loaded with briquettes would have been hauled up and then lowered using a winch. How long this arrangement lasted remains unknown, but it most likely continued until the rearrangement of the coal dump yard in 1943.

The northern coal dump sidings were given over entirely to briquette storage but a reserve supply of coal for locomotive and emergency pumping use was retained.⁶⁹

Part 2 of this article will cover the impact of the Merbein electrification, the introduction of internal combustion locomotives as the principal haulage units, and later operation of the tramway, leading up to the conversion of the pumping station to electric operation and the closure of the light railway. The internal SECV ash disposal tramway workings will also feature.

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Tweed Heads breakwater

The N S.W. Government at the time of Separation thought they had done a clever thing in stipulating that their boundary should include a strip of land on the south side of the river, keeping it in their own hands, and including in the strip the town and harbor works, pilot's station, &c., on the south side. This was fortunate for Queensland, because in the first place they incurred no liability for the enormous sums of money spent in making the Tweed navigable for small craft. I suppose there is no harbor in Australia which has had so much money

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spent upon it for such a little trade. The huge cliffs of blue stone have been quarried out and conveyed by specially built tramway to the breakwater, extending on both sides of the river for a considerable distance. The heaps of junk in the shape of rails and trucks show the extensive character of the undertaking, and some work is still going on, as the fierce seas in a southerly gale play up old Harry with man's ironstone barrier, and repairs are continually required. On my visit there last week I saw huge barges with engines and cranes on board lifting stone from the bottom of the backwater and building up breaches in the stone walls, and tipdrays bringing fresh loads from the quarries.



The Victoria Foundry (centre of image, sandwiched between the Stork and Town Hall hotels) looking south-west along Armstrong Street (left foreground), and stretching through to Doveton Street (today's Midland Highway) on a wider frontage at the top right. (For a detailed description of the layout of the works see The Star [Ballarat], Thursday 5 December 1861, page 1). The Phoenix foundry is just out of frame at top left. An electronic composite of two images from the panorama of Ballarat photographed in 1872 by William Bardwell. (Note that there is a slight but unavoidable discontinuity in the image).

Hunt & Opie: pioneer locomotive builders of Ballarat

by Peter S. Evans

James Hund James Opie

In *Light Railways* 224, Philippa Rogers outlined the operational history of Western Australia's first locomotive, *Ballaarat.* This article will attempt to add some context by describing the lives of the engineers who built her. Imagine if you will, twoVictorian pioneers, competent foundrymen, energetic, innovative, and ideally placed on an important goldfield with a high demand for machinery. The foundry they established quickly became one of the most important in Ballarat, but their lives were to be cut tragically short by ill-health.

The Victoria Foundry was begun by Oakey, Creber & Coy in Armstrong Street, Ballarat (sandwiched between the Stork and Town Hall Hotels), in August 1856.¹ The principals of the firm were George Oakey, William Creber, James Hunt and James Michael Opie. The partnership was dissolved in August 1857 with Creber (a builder and contractor) leaving, with Oakey, Hunt and Opie to continue on alone.² In turn George Oakey (who advertised as a manufacturer of metallic engine packing) resigned from the partnership in May 1860 leaving Hunt and Opie in control of the business.³

James Hunt was born circa 1825 in Dudley, England, the son of mine manager Elisha Hunt and Ann Hunt, née Dudley.

Dudley was at the heart of the Black Country, centre of the industrial revolution, so it would seem that James was destined to work in the iron industry from birth. At the age of 19 he married Grace Timmins of Dudley and, by 1851, they had one child, and James gave his occupation as 'iron moulder'. The family arrived in Victoria circa 1853 by means as yet undiscovered. Of their six children, only three would survive to maturity.⁴

James Michael Opie was born circa 1828 in Perran Arworthal, Cornwall, the son of Tristram and Ann Opie (occupation and maiden name not recorded). Cornwall was at that time a great centre for mining in the British Empire. James Opie arrived in Melbourne as one of 244 assisted immigrants aboard the *Royal George* on 28 November 1849, giving his occupation as 'brass moulder'. One month later, on Christmas Eve, he married dressmaker Grace Rowling (who had travelled as an assisted immigrant on the same ship). The couple would have two sons and two daughters.⁵

It would seem Hunt and Opie were inevitably drawn to the world-famed mining district of Ballarat. Under their management the premises of the Victoria Foundry were enlarged, and castings of every description in iron, brass and other metals were offered to miners, sawmillers and any customer requiring machinery.⁶ It was not long before the size and variety of the castings on offer were significantly increased.⁷

The firm constructed the first stationary steam engine to be built in Ballarat in 1858 (with an 11 inch cylinder), destined for a mining company at Smythesdale.⁸ By 1860 they employed 53 men and boys with a weekly wages bill of around \pounds 200, and works covering three-quarters of an acre. The partners were producing engines having cylinder diameters as large as 201/8 inches and a stroke of 42 inches and developing 40 nhp, attached to both winding gear and pumps, and having a flywheel 15 feet in diameter (cast in three segments), the latter weighing in aggregate five tons.

VICTORIA FOUNDRY, BALLARAT.

G. OAKEY, CREBER & CO., beg to inform the miners and public in general, that they are now prepared to do Castings either in brass or iron to any weight or pattern. Also, — Engineering pattern making, smiths' work, in all its branches, &c., at town prices, and trust by strict attention to business to merit a share of their patronage.

Observe-Victoria Foundry, Near Bath's Hotel, Armstrong-street, Ballarat.

P.S.—The highest price given for old from and brass of every description. August 21st, 1856.

Advertisement from The Star (Ballarat), Thursday 4 September 1856, page 1.

Engines were supplied with Cornish boilers 18 feet long and 6 feet 2 inches in diameter. An engine, two boilers and pump complete sold for as much a \pounds 2,250. An order such as this could be turned out in a mere five weeks. With the impending arrival of the railway in Ballarat, the firm was considering the possibility of manufacturing steam locomotives for the main line.⁹



A fine example of the pattern-maker's art: the pattern for the hub of the Anderson's mill waterwheel, one of the earliest surviving patterns in Victoria, constructed in Hunt & Opie's own workshops, and unfortunately stolen from the mill in March 2014. Photo courtesy Parks Victoria

The reality of the Victoria Foundry's first locomotive was somewhat different. Completed in November 1861 under the superintendence of William Errington to the Victorian railway gauge of 5 feet 3 inches, weighing only four tons and christened *Lady Barkly*, the locomotive was built to the order of James Richard Davies, engineer to the contractors for the line from Geelong to Ballarat, and was far from conventional.



The waterwheel powering Anderson's grain mill at Smeaton. The 25-ton overshot wheel was constructed by Hunt & Opie's Victoria Foundry in late 1861, was 28 feet in diameter with a breast of 7 feet 3 inches, and developed 35 hp at 3 rpm. (For further details see The Star, [Ballarat], Thursday 5 December 1861, page 1; and Saturday 3 May 1862, page 20). Photo: Peter Evans



The Victoria Foundry of Hunt & Opie constructed both theextraordinary and the mundane: a furnace-door casting at Anderson'smill, Smeaton.Photo: Peter Evans

It was designed to run on six-inch square wooden rails, with V-grooved guide wheels at a 45 degree angle, each bearing on the top and inner surfaces of the rails keeping it running in the correct direction. Each guide wheel was on an independent axle, thus avoiding the 'dragging' effect on curves of conventional flanged wheelsets on the wooden rails. Traction was provided by a set of flangeless wheels $4\frac{1}{2}$ inches in width running on top of the rails. The guide wheels were fitted with India-rubber springs while the 'carrying' wheels were fitted with conventional leaf springs. Construction of the locomotive was said to cost somewhere between \pounds 1,500 and \pounds 2,000, and it was tested on a curved line of 12 chains constructed on Davies' property near the 'railway depot' at Lal Lal (sometimes given as 'Green Hills'). By use of this technology it was estimated that a developmental

railway could be constructed complete with locomotives and rolling stock for as little as $\pounds 5,000$ per mile.¹⁰ While Davies had applied for a Victorian patent for the technology, he had simply either borrowed (or reinvented) a lapsed patent secured by Englishman William Prosser in 1844 (which was itself adopted in a modified form for use with iron rails in a system patented by Frenchman Jean-Claude Républicain Arnoux, and used for a time on the Paris, Sceaux and Limours Railway).¹¹

A buyer for the tiny Lady Barkly could not be found in Victoria, and Davies sold it to the government of the Southland province in New Zealand, and re-gauged it for use as a contractor's engine on the standard-gauge Oreti railway between Bluff and Invercargill.¹² After some initial optimism, the tiny locomotive was not a success, lacking traction with its single drive wheels. Its designer Errington having moved to the Soho Foundry of Robinson, Thomas & Coy in Ballarat, in December 1863 the latter were favoured with an order for two much larger locomotives (weighing 18 tons each) to be built to the same principle.¹³ These were no more successful than their predecessor, and, after the local adaptation of a portable engine on the same principle was tried, the system was abandoned in 1867. Lady Barkly found an alternative use as a much-modified four-wheeled geared locomotive on a bush tramway about 40 miles north of Invercargill and, finally, powering a sawmill a few miles south of the Invercargill post office; today a static replica is on display on the Stead Street Wharf in Invercargill.¹⁴

Other unconventional items manufactured by the Victoria Foundry included a bell for the Ballarat Fire Brigade, a pair of cannons to be fired to celebrate the marriage of the Prince of Wales and Princess Alexandra, and a 'mash tun' with a diameter of 18 feet for the Warrenheip Distillery.¹⁵



Lady Barkly on her test track at Davies' property in 1862.

Unknown photographer, State Library of Victoria image H1077/650



Above: Lady Barkly circa 1886 in her near-final form as an 0-4-0 geared bush-tramway locomotive running on standard timber-tramway wheelsets. Courtesy Invercargill Library & Archives

Right: William Prosser's patent railway wheels; while shown running on iron bridge-rails rather than wood, the principle is exactly that adopted by Davies. From Prosser, Thomas (1845). Some remarks on the advantages of Prosser's patent railway guide wheels on either iron or wooden rails. J. King, printer, London, page 2.

Below: The guide-wheel system adopted by Jean-Claude Républicain Arnoux ran on steel rails, the guide wheels having an angled surface without grooving. The invention of the bogie was the primary trigger for the demise of this system. From Engineering, Friday 29 January 1869, pages 80 and 81.

PROSSER'S PATENT RAILWAY GUIDE WHEELS.



FRONT ELEVATION.



LOCOMOTIVE FOR THE PARIS, SCEAUX, AND LIMOURS RAILWAY.



One of the two Soho Foundry locomotives built in Ballarat in 1864 to Davies' patent for use on the Oreti railway. Both had short operating lives, and ended up off the rails and powering sawmills. Unknown photographer, State Library of Victoria image H40614/1.

Frequent advertisements in the Ballarat newspapers show that the Victoria Foundry was also doing a significant trade in second-hand mining machinery.

James Opie died suddenly of an aneurism of the aorta on 23 January 1868.¹⁶ He was aged just 40. His probate papers provide a snapshot of the equipment held by the Victoria Foundry at that date. The works was powered by a vertical engine of 9 inch bore and 18 inch stroke drawing steam from a multi-tubular boiler, and a portable engine of 5 inch bore and 9 inch stroke. As well as the usual hand tools, smithing, foundry appliances and stock, there were five lathes of varying sizes, a vertical drilling machine, a screw-cutting machine, a shaper,

a plate-bending machine, a punching machine, and a Rigby steam hammer. James Opie's widow Grace sold all of her late husband's interest in the Victoria Foundry to James Hunt (just prior to a scheduled auction) for the sum of $\pounds 2014$ 8s 6d. Hunt would henceforth carry on the business alone.¹⁷

In 1869, the Victoria Foundry built its largest steam engine to date, a machine for the Leviathan Company at Napoleons with a cylinder diameter of 25 inches and a stroke of 4 feet. The engine was fitted with expansion gear. Its flywheel weighed almost 10 tons and the engine developed 63 nhp, drawing steam from a Cornish boiler 28 feet in length and 6 feet 6 inches in diameter and fitted with seven Galloway tubes.



The Lady Barkly replica on the Stead Street Wharf at Invercargill. Photo: Colin Harvey



Builder's photograph of Ballaarat, almost certainly taken on 14 March 1871 and sited near the Armstrong Street entrance to the yard of the Victoria Foundry. The top-hatted dignitaries who adorn her footplate and stand by her smokebox almost certainly include the mayor of Melbourne, Thomas Macpherson, and Ballarat merchant Joseph Jones, worn out with 'speechifying'. The group on the ground near her bunker would seem to be artisans, and likely include Johnathan Robinson, foreman of the Victoria Foundry, and W. Watson, engineer for the West Australian Timber Company. Perhaps the gentleman standing with quiet satisfaction and his hand on the edge of the footplate of the locomotive is James Hunt himself?

The engine drove pumps with a lift of 400 feet in cast-iron pipes 15½ inches in diameter, and six puddling machines (four of which were supplied by the Victoria Foundry), plus any other surface machinery required on the claim. An English engineer visiting the Victoria Foundry commended the engine on both the quality of the workmanship and the finish. The whole was supplied at a price equating to a reduction of 30% on prices ruling a decade prior. The engine alone was said to be lower in price than any imported engine of the same capacity offered by tender.¹⁸

In the second half of 1870 the Victoria Foundry secured a large order for the West Australian Timber Company, a firm backed by Ballarat interests. The order included two vertical sawing frames (complete with overhead drive shafting) for breaking-down logs into flitches, and two circular saw benches for ripping the flitches into finished sizes. The timber company would be laying a 12 mile long railway built to the gauge of 3 feet 6 inches between its jetty and its forest concession, and the order included wheelsets and axle-boxes for 50 waggons. The whole order was completed in six weeks, weighed about 30 tons in total, was worth \pounds 700, and was to be transported to Melbourne for shipping to Western Australia. As mining declined in Ballarat in the early 1870s, this order was considered an important step into diversification for the local foundries.¹⁹

No sooner had this order been shipped than another was received, this time for a locomotive to work the timber company's railway.²⁰ The locomotive was completed and tested on 14 March 1871, and given the name *Ballaarat* by the mayor of Melbourne, Thomas Macpherson. She was designed by Johnathan Robinson, foreman of the Victoria Foundry, and construction was supervised by W Watson, engineer for



Ballaarat is said to share some of the main characteristics of the engines made by Fletcher, Jennings & Coy of Whitehaven, England, including the symmetrical distribution of the solid-disc wheels and the Gooch valve-gear driven off the leading axle. The Engineer, Friday 29 September 1882, page ii. the West Australian Timber Company. The boiler for the locomotive was built in Ballarat using the best Lowmoor iron by Walker & Hickman's Union Foundry and pressed to 150 psi, the remainder of the locomotive being completed at the Victoria Foundry. The locomotive weighed 10 tons, carried its water in a tank between the frames, had four coupled wheels, two cylinders 7 inches in diameter with a stroke of 14 inches, and exerted a tractive effort of 2,330 lb. The cost was to be $\pounds 800$ delivered in Melbourne. A test was made with the locomotive jacked up on blocks. '*Ballaarat* kept puffing away all day, and in Mr Hunt's office copius libations of potent liquors added moisture and merriment to the drier and duller work of speechmaking.' On 22 June 1871 the locomotive was dispatched by rail to Melbourne.²¹

As the first locomotive to operate in Western Australia, it would prove to have a short working life (although not from any fault in its design or construction). The West Australian Timber Company was eventually in trouble, with all of its assets auctioned in 1888. After a further chequered career and intermittent use by the timber industry, the locomotive was placed on a plinth in a park in Busselton in 1937. In 2012 it was dismantled for restoration and, in 2017, installed undercover at the Busselton Visitor Centre on the foreshore in Busselton.²²

Mining work continued to be the mainstay of the Victoria Foundry with innovations in iron-framed stamping batteries, ore treatment and steam-saving apparatus adding interest to the work. A number of improved cast-iron buddles were manufactured for the mines at Clunes, the bottoms being ribbed to better catch the gold, and their production was expected to achieve orders from interstate. James Hunt even patented a

'distance indicator' or milepost made from cast-iron.23 Almost the last innovation to leave the Victoria Foundry was a water turbine adapted from the Fourneyron principal and destined to drive 20 head of stamps at the New North Clunes mine. The turbine was 23 inches in diameter and expected to develop 30 hp, and was described as 'a nicety of casting and fitting'.²⁴ In 1823, Frenchman Jean Victor Poncelet had introduced curved blades to a new design of undershot waterwheel, more than doubling its efficiency. In 1826, Poncelet suggested turning his wheel on its side, permitting the water free egress from the wheel without having to reverse its flow. This in turn influenced fellow Frenchman Benoit Fourneyron, who built the first successful outward flow radial water turbine in 1827. The turbine developed an efficiency of 80%, even when the wheel was completely flooded by water in the tail race. It was patented in 1832, the patent including for the first time the term 'hydraulic turbine'. Its high power, fast rotation and compact size revolutionised the water power industry. Fourneyron died in 1867 with the water turbine widely accepted and the technology spreading world-wide.25 The successful casting of the 'runner' for such a turbine required accurate pattern-making and a refined casting technique, attesting to the high degree of skills available to the Victoria Foundry.

In late 1872 James Hunt wished to give up the foundry business and was seeking an active partner or, alternatively, was willing to offer the foundry on favourable terms to a cooperative society of competent tradesmen.²⁶ There were no takers, and the last advertisement for the foundry ran in the closing days of 1872, the foundry being left idle thereafter. In June 1873 a last-ditch attempt was made to form a cooperative company, and operations had restarted by January 1874.



Ballaarat restored and undercover at the Busselton Visitor Centre on the foreshore in Busselton today.

Photo: Phillip Massaad



Lewis & Munday's patent buddles (manufactured by the Victoria Foundry, Ballarat) at the Port Phillip Company's mine at Clunes in 1869. The Port Phillip mine was notable for extracting every last possible grain of gold from its quartz; the buddles concentrated pyritic tailings for roasting (to drive off the sulphur and arsenic) prior to re-crushing and amalgamation with mercury in steam barrels. Illustrated Australian News for Home Readers, Saturday 19 June 1869, page 132, State Library of Victoria image IAN 19/06/69P.132.

However, by April the same year James Hunt was forced to retire on account of his failing health.²⁷ In February 1875 the stock of patterns and machinery of the Victoria Foundry was advertised for auction to be held in March.²⁸ The sale either never took place or there were no immediate buyers.

James Hunt died of complications of diabetes at Geelong on 20 July 1875, aged only 50. His will left everything to his wife Grace.²⁹ In August 1875, everything was readvertised for sale in lots to suit purchasers and, in April 1876, the premises were advertised for rent complete with a remaining steam engine and said to be suitable for a timber yard or livery stables.³⁰ It must be assumed that the bulk of the equipment from the Victoria Foundry was purchased by other foundries in Ballarat – the Phoenix Foundry almost next door on Armstrong Street being a strong contender.

The proprietors of the Victoria Foundry were unlucky in having their lives cut short by medical problems. Who knows what the foundry might have produced had it continued for a decade or more?

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In the Shadow of the Prom



In the Shadow of the Prom



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Builder's photo of the Krauss locomotive.

Buderim tramway Krauss locomotive

Submitted by John Browning

As part of some research the following item was found in the Queensland State Archives:

To the Secretary to the Railway Commissioner, Brisbane. 1st August 1914 Memo: <u>New locomotive for Buderim Tramway</u>

In answer to your telephone message of the 30th ultimo re the above, I instructed Inspector A.K. McCallum to undertake this work and he reports as follows:

In attention to instructions, I proceeded to Palmwoods per 31 down and made an inspection of the Buderim locomotive, viz a new loco by Krauss & Coy, Munich, maker's number 6854, 2ft 6in gauge, commenced service July 1914; six wheels coupled all with flanges and single bogie at the trailing end. Diameter of coupled wheels is 26 inches and of single trailer 22 inches. Cylinders are 11 inches diameter by 11¾" stroke. Walschaert motion. Cast steel cross-head under double guide bars, all split brasses in coupling and connecting rods, splash spring lubricators, i.e. oiling only when in motion. Spring gear set up with equalising beams longitudinally and adjustable screws connected transversely with heavy cast steel spring beams, fitted with Westinghouse brake by Genelschaft, Hanover,¹ on all coupled wheels; main reservoir under bunker, auxiliary reservoir under footplate on right hand side.

The hose pipe connection ³/₄" will require altering to suit wagon stock.

Photo: John Browning collection

Hand brake operated by level ball and rack. Main framing widened at trailing end to suit wide firebox. Two side tanks and one underneath and between main frames all connected together; collective capacity about 400 gallons. Two sand boxes on top of boiler. The boiler is of the ordinary locomotive type with 87 tubes 15%" in diameter with a working pressure of 12 kilos equal to 170 lbs per sq inch. The smokebox is of wrought iron and the spark arrestor of a conical chimney type. The main steam and exhaust pipes are parallel to and from cylinders, enabling easy access to tubes in smokebox. The main steam distributor is on shell crown connecting to injectors, whistle, steam gauge etc. Water column is protected and two test cocks. Lever radial firedoor gear, two spring loaded safety valves on dome, a pump on the top of left hand tank by American Pump Coy 4" x 3" x 6" for lifting water from Creeks for feed supply.

<u>Tools</u>

One traversing jack and usual spanner and fireirons, Kerosene headlights, a cowcatcher each end of a very light pattern. Centre buffers and couplings.

The engine was in steam on construction work on my arrival, consequently I had very little opportunity of testing its tractive efficiency. About 3 miles of rails have been laid, and if the gradients at the far end are not too severe, the engine should fulfil all requirements. It is in good working order and correctly assembled, the work throughout being well finished.

With this I concur. Chief Mechanical Engineer.

1. The air brake was manufactured by Westinghouse Eisenbahn-Bremsen-Gesellschaft (Westinghouse Railway Brake Co), Hanover, Germany.



Above: This photo of the Krauss locomotive must have been taken in the period between March 1917 and January 1920 as the driver (standing on the left) is Hilton Ford. Ford was born in December 1888 and died unexpectedly in January 1920. Before becoming the Tramway's second driver he had been a driver on the Moreton Mill cane railway. Standing on the ground by the cab is fireman George Newberry, who had been born in England. Newberry was the first fireman on the tramway, and continued in that role (apart from overseas service in the artillery from 1916 to 1919) until appointed driver in January 1923. In the cab doorway is Doug McIntosh, Ford's brother-on-law and about 10 years his junior. (Thanks to Helene Cronin for these details). A number of the features reported by QR Inspector McCallum are evident including the continental-style buffer and coupling, the rather flimsy cowcatcher, the kerosene headlight, the distinctive safety valves, and the air pump. Also of note is the lengthy unlagged smokebox, the air brake hose draped over the cowcatcher, and the prominent valve chests. The water lifter pump has already been removed from the top of the side tank. Photo: John Browning collection



Left: Looking down at the Krauss locomotive from the government railway formation at Palmwoods as the train awaits departure for Buderim. Bill McDonald (centre) was the first driver on the line and he served in this role from December 1914 to March 1917. The photo must have been taken some time after the Tramway opened in June 1915. The water lifter pump has already been removed from the locomotive and the passenger car looks somewhat weathered. Photo: Bruce Belbin collection

We present another selection of photos taken in the 1950s and 1960s by P G Dow. These photos were all taken at Nambour in Queensland and we thank LRRSA member Bob Dow for making them available. Chris Hart has prepared the captions and Mike McCarthy has weaved his magic to prepare them for publication.



Above: Shay on display at Moreton Mill, circa 1960. This is Lima 2 truck Shay 2800 of 1914, which was rebuilt in 1948 using some parts from Lima 2 truck Shay 2091 of 1908. Photo: P G Dow *Below:* Moreton Mill's Krauss 0-6-0T Moreton (4687 of 1901) crosses Currie Street in the middle of Nambour in 1954. Photo: P G Dow









Fowler 0-4-2T Bli Bli (14418 of 1915) with Fowler 0-6-0T Coolum (16036 of 1923) to the left and Fowler 0-4-2T Petrie (19930 of 1933) to the right at Moreton Mill in 1960. Photo: P G Dow

Fowler 0-6-0T Eudlo (16207 of 1925) brings a rake of full cane trucks up to Moreton Mill across Currie Street in Nambour in 1954. Photo: P G Dow





Please send contributions to: Industrial Railway News Editor, Christopher Hart 15 Dalrymple St, Ingham, QLD 4850 Phone: (07) 47766294 e-mail: industrial@Irrsa.org.au

Special thanks to contributors to the *Sugar Cane Trains/Navvy Pics 2ft* Facebook page.

QUEENSLAND

FAR NORTHERN MILLING PTY LTD, Mossman Mill

(see LR 282 p.30) 610 mm gauge By early November, the Bally Hooley trackage at Port Douglas was being lifted for use by Mossman Mill. Newsport 4/11/2021

MSF SUGAR LTD, Mulgrave Mill

(see LR 282 p.30) 610 mm gauge

Clyde 0-6-0DH 25 *Cucania* (63-289 of 1963) returned to service on 23 October following a stint undergoing work in the loco shed and has been repainted below footplate level. It has yet to be fitted with a second hand Mulgrave type cab. Gregorio Bortolussi 10/21

MSF SUGAR LTD, South Johnstone Mill

(see LR 282 p.30)

610 mm gauge

By 16 October, work on the new bridge over the North Johnstone River had advanced to where a number of piers and spans had been constructed on the northern part of the river. The SVT-JWL tamping machine (573 of 1979) was seen at Grima Road, Wangan on 29 November. With bridge strengthening in recent times, EM Baldwin B-B DH 32 *Liverpool* (10385.1 8.82 of 1982) is now capable of working as far as Silkwood on the line main line south. Gregorio Bortolussi 10/21; Adrian Watson 11/21; Peter Smart 11/21

TULLY SUGAR LTD

(see LR 282 p.30) 610 mm gauge

Road works at an intersection on the Bruce Highway at Feluga will see the existing Bruce Highway level crossing lengthened to accommodate a turning lane and a new level crossing constructed nearby for the rerouting of East Feluga Road. Work is expected to start in January 2022. *Cairns Post* 8/12/2021



Com-Eng 0-6-0DH multi-unit locos Faughy (AL4190 of 1965) and Douglas (AL2562 of 1963) at the southern entrance to the Mossman mill yard on 17 October. Photo: Gregorio Bortolussi



Mossman Mill's EM Baldwin B-B DH Daintree (7303.1 7.77 of 1977) waits at Raldinis beside Daintree Road for Com-Eng 0-6-0DH multi-unit locos Cook (AL3372 of 1964) and lvy (AL4181 of 1965) to pass through with a rake of empties heading north on 31 October. Photo: Gregorio Bortolussi





Above: Com-Eng 0-6-0DH locos 8 Charringa (A1926 of 1958) and 7 Highleigh (B1010 of 1956) potter round the Mulgrave Mill yard on 9 November while harvesting takes place in the adjacent cane paddock Photo: Gregorio Bortolussi **Left**: Clyde 0-6-0DH 25 Cucania (63-289 of 1963) sports a partial repaint at the northern entrance to the Mulgrave Mill yard on 23 October while Walkers B-B DH 20 Mulgrave (612 of 1969) looks on. Photo: Gregorio Bortolussi **Below:** With a poinciana tree flowering in the foreground, Marian Mill's EM Baldwin B-B DH Balmoral (10684.1 4.83 of 1983) heads across the Pioneer River bridge near Mirani on 14 December. Photo: James Chuang



WILMAR SUGAR (HERBERT) PTY LTD, Herbert River Mills

(see LR 282 p.30) 610 mm gauge

Macknade Mill's EM Baldwin B-B DH Selkirk (6750.1 8.76 of 1976) and EM Baldwin 6 wheeled brake wagon 2 (7065.5 6.77 of 1977) were on the Victoria Mill sugar train from the evening of 22 October and spent the rest of the crushing season on this duty. Clyde 0-6-0DH Ingham (64-382 of 1964) returned from Invicta Mill on 12 November after spending the crushing season there. Inside the Victoria Mill loco shed on 29 November were brake wagons Com-Eng BV2 (PB112 of 1969), which was little more than a frame sitting on shop bogies, and EM Baldwin 6 wheeler BV8 (7065.1 6.77 of 1977) which was a rolling frame. Being worked on in the shed was Clyde 0-6-0DH Lucinda (65-436 of 1965) although it was still waiting to be fitted with the cab from Clyde 0-6-0DH 11 (65-383 of 1965). 168 x new 11 tonne bogie bins will be assembled in the Macknade Mill truck shop during the 2022 slack season with preliminary work already underway in December 2021. Fabrication work for these bins was done in the Wilmar Ingham and Burdekin workshops. Earthworks for a new crossing loop in the 4 Mile area were underway by November. It will extend from the 3 Mile almost to the existing 4 Mile Loop. Two people were injured when their car collided with a cane train in the Abergowrie area on 19 November. Editor 10/21, 11/21, 12/21; Luke Horniblow 11/21; Townsville Bulletin 19/11/21

WILMAR SUGAR (INVICTA) PTY LTD, Invicta Mill, Giru

(see LR 282 p.31) 610 mm gauge

Clyde 0-6-0DH *Ingham* (64-382 of 1964) was sent back to Victoria Mill on 12 November after being on loan for the crushing season. The STM-XLC tamping machine (94952 of 1993) was at Kalamia Mill on 22 November. Luke Horniblow 11/21

WILMAR SUGAR PTY LTD, Pioneer Mill, Brandon

(see LR 281 p.38) 1067 mm gauge

Ex Victoria Mill Walkers B-B DH locos 680 and 681, both of 1972 are being rebuilt for Proserpine Mill and will become the new 12 and 14 respectively. Also being rebuilt is ex Invicta Mill Walkers B-B DH 632 of 1969 which will become the new *Karloo* at Plane Creek Mill. Kieran Koppen 11/21

WILMAR SUGAR (KALAMIA) PTY LTD, Kalamia Mill

(see LR 282 p.31)

610 mm gauge

Plane Creek Mill's Plasser KMX-08 tamping machine (415 of 1995) was seen in the navvy shed on 22 November with the Invicta Mill Tamper STM-XLC tamping machine (94952 of 1993) parked outside. Luke Horniblow 11/21

WILMAR SUGAR (PROSERPINE) PTY LTD, Proserpine Mill (see LR 280 p.32)

610 mm gauge

Early in November, Clyde 0-6-0DH 5 (65-433 of 1965) was seen bringing in fulls at Foxdale. Clyde 0-6-0DH 7 (65-442 of 1965) was in use while EM Baldwin B-B DH 9 (6626.1 7.76 of 1976) was out of action in mid October. Clyde 0-6-0DH 3 (58-195 of 1958) is not in use. Ex Victoria Mill Walkers B-B DH locos 680 and 681, both of 1972 are being rebuilt at Pioneer Mill for Proserpine Mill and will become the new 12 and 14 respectively. Gordon Ross 11/21; Brian Hamilton 10/21; Tom Badger 12/21; Kieran Koppen 11/21

MACKAY SUGAR LTD, Mackay mills

(see LR 282 p.33) 610 mm gauge Plasser KMX-12T tamping machine TTAMP5 (376 of 1990) was seen crossing the QR at the Kuttabul diamond in mid December. James Chuang 12/21

WILMAR SUGAR (PLANE CREEK) PTY LTD,

Plane Creek Mill, Sarina (see LR 281 p.38) 610 mm gauge The Plasser KMX-08 tamping machine (415 of 1995) bad gone on loan to Kalamia Mill by 22

1995) had gone on Ioan to Kalamia Mill by 22 November. Ex Invicta Mill Walkers B-B DH 632 of 1969 is being rebuilt at Pioneer Mill and will become the new *Karloo* here. Luke Horniblow 11/21; Kieran Koppen 11/21

BUNDABERG SUGAR LTD, Millaquin Mill

(see LR 282 p.33) 610 mm gauge The roll over of Bundaberg Foundry B-B DH *Booyan* (001 of 1991) in 2020 happened after hitting a cow in the Fairymead area. Among other things, the transmission was holed and it is intended that the loco will be repaired eventually. Nick Glass 9/21

ISIS CENTRAL SUGAR MILL CO LTD

(see LR 282 p.34) 610 mm gauge Walkers B-B DH 2 (598 of 1968) was on poison spraying duties early in December while the mill was shut down during wet weather. Mitch Zunker 12/21

OVERSEAS

FIJI SUGAR CORPORATION

(see LR 282 p.34) 610 mm gauge

Ex Bingera Mill Com-Eng 0-6-0DH (AJ2359 of 1962) can be seen in the background of a photo taken at Lautoka Mill sometime in November. The upper part of the loco is painted yellow with the exception of the hood top, which is black. A man lost his arm when he fell from a loco taking cane to Rarawai Mill from Tavua on 20 November. He had been trying to hitch a ride on the loco when the incident occurred.

The Fiji Times 27/11/2021; Naleen Maan 11/21



Marian Mill's Eimco B-B DH 18 Gargett (L255 of 1990) crosses Wallins Road in the Hampden area on 11 December. Photo: Tom Badger



Above: Farleigh Mill's EM Baldwin B-B DH Inverness (10123.1 5.82 of 1982) crosses the Wallingford drawbridge over the closed QR line up the Pioneer Valley as it heads out along the Victoria Plains line on 29 October. Photo: Steven Jesser **Below:** Walkers B-B DH 4 (656 of 1970) in the Isis Mill full yard on 2 November. Photo: Brian Bouchardt



Field Reports

Please send any contributions, large or small, to fieldreports@lrrsa.org.au or to PO Box 21, Surrey Hills, Vic 3127.

Hudson Brothers Narani Sawmill Tramway log landing ramp, Smiths Lake NSW Gauge 1067mm

Over the last 18 months or so I have been conducting an archaeological investigation of an unusual timber tramway log landing ramp located within the littoral zone of the aptly named Tramline Beach on the southern shore of Smiths Lake near Bungwahl on the Mid North Coast NSW. The Tramline Beach log landing ramp is situated at the northern end of what was the Hudson Brothers Narani sawmill tramway.¹ The Narani sawmill commenced operations in 1873 and was located on the northern-most shore of Myall Lake near the present Neranie (as it is now named) - Hearts Point day-use area of the Myall Lakes National Park.

By the mid-1870s a 2.2 kilometre horse or bullock-drawn portage tramway was built to connect the sawmill with Smiths Lake located to the north. In 1879 the livestock were replaced by a steam locomotive, with a second loco joining the first in 1881. Hudson Brothers closed the mill and tramway in 1894 and the locomotives were later bought by Hungerford & Sons to work on the construction of the Forster breakwater. The Narani sawmill and tramway were reopened in 1896 under new management and the tramway operated with bullock teams until the mill and line were permanently closed in late 1906 or early 1907.²

The Hudson Brothers sawmill sourced most of its logs from the Tarbuck Brush area (now Wallingat NP) situated to the north and west of Smiths Lake. There the Hudson Brothers constructed a second tramway which ran for about 8 km out from the Tarbuck Brush to its terminus at Tarbuck Point on the north-western shore of Tarbuck Bay on Smiths Lake. At Tarbuck Point the logs were rolled off the tram trucks and on to a steam powered paddle drogher for the short 2.6 km haul over to Tramline Beach on the southern shore.

At the Tramline Beach log landing the logs were then rolled off the drogher and 'wet' loaded onto to the tram trucks running on rails submerged in the water. Horses, bullocks and a steam winch were used to load the logs onto the trucks and to haul the loaded trucks further up the beach on the gently inclined tramway ramp to be marshalled into sets. At the head of the beach the sets were hitched to the steam locomotive for the short run over a low saddle ridge through a 5 metre deep cutting and on to the sawmill and village at Narani.

In the absence of any detailed contemporary descriptions of the operation of the tramway log landing ramp, I undertook an investigation of surviving archaeological features with the view to ascertaining details on the construction, dimensions and other technical aspects of the operation of the tramway ramp log landings. I was particularly intrigued as to how the log landings operated within the littoral zone when either partly or fully submerged.

It is fortunate that a 1904 photograph of the Tramline Beach log landing ramp site exists that shows 'wet' loading operations with a bullock-team-drawn log tram. Despite its grainy resolution, the photo does provide some very useful contextual details that aided my archaeological examination.³

The original design, layout and construction of this unusual (perhaps unique) littoral zone log landing tramway ramp, and the existence of its remnants today, are certainly entirely due to the topography and hydrology of Smiths Lake and its immediate environs.

Smiths Lake is a brackish mixed fresh and sea water body that is not a permanently tidal lake. Rather, it is what is referred to as an ICOLL (intermittently closing and opening lake or lagoon). The lake is subject to irregular and unpredictable fluctuations in its water level by as much as 2 metres or more. Its water level is influenced primarily by rainfall within its catchment, but also ocean tidal flows from irregular and intermittent breaches of the sea entrance sand bar, and evaporation during drought.⁴

At the time of my first inspection of the site in January 2020 the area was experiencing a period of prolonged drought and the sand bar was closed so the water level in Smiths Lake was very low – just 0.047 metres above the mean sea level Australian Height Datum (AHD). The lake's high-water flood level limit is 2.1 metres AHD. The dry conditions afforded the rare opportunity to inspect sections of the Tramline Beach site, including in-situ rails, that are usually completely submerged in the lake. The timing of that first inspection was indeed

Log tram at Smiths Lake, 7 September 1904 Photograph looking north over the Tramline Beach log landing ramp. Despite the grainy low-resolution image a number of details can be discerned. In the centre a six-bullock team can be seen hauling a log on tram trucks on the ramp adjacent to log landing #4 (to the left of the bullocks). The tramway rails appear to be just submerged in shallow water below the bullocks and log tram set. Two people can be seen sitting on the southern end of the log behind the bullock team. Another person, the bullocky with a whip, can be seen standing in the shallow water to the right of the bullock team. A log or spar can be seen rolled up against northern side of log landing #4 to the left of the log tram set. Logs can be seen rolled up on log landing #3 (on the centre right behind the log tram set). On the lower left a person with a broad-brimmed hat can be seen sitting on the end of log that is resting on log landing #5. Another figure (a child) is standing on the same log behind the seated figure on landing #5. Tarbuck Bay can be seen in the distance through the gap between Big Point (left) and Big Island (right). National Library of Australia collection.

fortunate as just a month later the Smiths Lake catchment received over 500 mm of rain in a week and the lake level rose rapidly to 1.205 metres AHD within a few days, submerging almost the entire Tramline Beach site. By late July 2020 the water level had risen higher to 1.872 metres AHD with the northern end (lake side) of the tramway ramp submerged under 2.3 metres of water.⁵

Why all the focus on water levels you might ask? Developing an understanding of how the water levels vary in Smiths Lake (the water level having always been variable and unpredictable) is key to understanding the design and operation of the 'wet' tramway landing and tramway ramp. The Tramline Beach tramway ramp complex can be described as being comprised of two key elements. The first is the tramway formation incline ramp rising from the water up the beach toward the south. The second element is comprised of six log landing structures, which I have designated log landings #1 to #6, numbered from the lakeside to landside, located on the western side of the tramway ramp formation.

The tramway ramp is a 3 ft 6 in (1067 mm) gauge tramway formation aligned N-E to S-W running up a slight incline (< 1 per cent grade) for a distance of about 230 metres over a wide soft sandy beach from the lake southwards toward the shoreline at Dogwood Road.

The northern lakeside section between log

landings #1 and #4 was built on a 2 to 3 metres wide rough stone foundation laid over a footing of heavy timbers embedded longitudinally and laterally in the soft sandy and silty lake bed. The buried timber footing provided a stable 'semi-floating' platform for the stone formation within which were laid longitudinal log bearers onto which the sleepers were fixed. The sleepers were further ballasted with small stones, sand and shell grit.

The southern section, beginning from the southern side of landing #4 and continuing to the head of the beach, was constructed mostly without the rough stone formation south from landing #4 nor the buried heavy timber footing south of landing #6.

Adjacent to landing #6 the arrangement and longer length of the visible timber sleepers embedded in the sand suggests that there may have been a short 40 metres long passing loop or siding there. A metal detector and steel rod probing survey at the head of the beach indicates that a 50 metre long section of iron rails and timber sleeper formation still exists in-situ buried under 250 mm of sand.

Just south of landing #5 lies the highly corroded remains of a squat cylindrical fire-tube boiler measuring approximately 2 metres (6 ft 6 in) long by 1 metre (3 ft 3 in) in diameter. Local theories suggest the boiler might be from a paddle wheel drogher punt used to haul logs across Smiths Lake, or from a small locomotive, or that it powered a steam winch or crane to assist with handling logs.

The boiler looks to have been too small to power a drogher or a locomotive so it would most likely have been used for a steam powered cable winch used to haul logs between the landings and/or onto the tram trucks. A few metres west of the boiler surface water run-off into the lake has partially exposed what could be sections of the blunt bow of a small drogher wreck situated between landings #5 and #6. Metal detector and steel rod probing survey indicates that the possible drogher wreck remains extend a further 20 metres to the south-west buried under 200-300 mm of sand. Indeed, the metal detector survey between landing #5 and the head of the beach identified almost 800 subsurface iron objects.

Along the western side of the tramway ramp formation are the remnants of six log landing structures (#1 to #6 from the lakeside to landside). Landings #2, #3, #4 and #5 are comprised of three large-diameter (700 mm to 1000 mm) log bearers, varying in length from 4 metres to 14 metres, laid out generally parallel to the tramway formation and set several metres apart. The remains of rusted iron spikes along the top face of several of the log bearers indicates that a skid deck of pole logs had once been fixed to the log bearers to allow the large logs to be rolled over the landing and onto the tram trucks. Several of these detached skid deck logs are extant lying on the sand beside landings #2, #3, #4 and #5.

Landing #6 is different to the other landings being constructed of two 5 metres long by 600 mm wide squared-off bearers running parallel with the tramway formation. This landing is set back 8 metres from the tramway so may have been used to store overflow logs rather than for loading logs directly onto the tram trucks.

Log landing #1 (at the northern lakeside end of the tramway ramp) is comprised of four large diameter logs running generally north to south in an open V shaped alignment 10 metres wide at the base and opening to about 20 metres wide at the northerm end into permanent deeper water. This would have been the landing used by the drogher when water level was low. Indeed, even at a time of very low water as was observed in January 2020 (0.047 metres AHD), landing ramp #1 would have been functional while the other five ramps further up the tramway ramp were high and dry.

The layout, orientation and construction of the tramway ramp and log landings at Tramline Beach are functionally quite ingenious adaptations to the local topography, hydrology and bathymetry of Smiths Lake. The archaeological observations confirm that the tramway ramp and log landings were specifically designed to take account of the unpredictable non-tidal and tidal variation of water levels in the lake over time and for handling heavy logs on the shallow and often choppy water. The design allowed for logs to be rolled off a drogher directly onto whichever log landing had sufficient water depth (not too shallow, not too deep) for handling the logs onto the waiting tram trucks.

The author would be interested to know of any other examples of tramway to water to tramway transhipment operations like this one that may have operated elsewhere in Australia. Dr David Cameron 09/2021

References

- The Hudson Brothers Company operated large-scale railway rolling stock factories in Sydney at Redfern, and later Granville, and also Wickham in Newcastle. Hudson Brothers was the antecedent company from which Clyde Engineering was formed. For details on the history of the Hudson Brothers vertically integrated timber, sawmilling, shipping and manufacturing interests see Jehan, David (2019), Hudson Brothers: A History of Hudson Brothers Carpenters, Engineers & Manufacturers 1866-1898, Eveleigh Press, Sydney.
- Ron Madden, The Narani-Forster-Ulverstone Locomotive Conundrum, In Light Railways 153 June 2000, and Jim Longworth, Hudson Brothers' timber tramways between Tarbuck Brush and Narani, In Light Railways 155 December 2000.
- 3. This photo was published with Longworth's article in *Light Railways* 155, page 5.
- Great Lakes Council [Mid Coast Council] (September 2008), Smiths Lake Flood Study, Webb, McKeown & Associates Pty Ltd, Sydney.
- 5. The depth measurement for the submerged north end of the tramway ramp was achieved by line and sonar soundings taken from a boat. Water level data for Smiths Lake was sourced from the Manly Hydraulics Laboratory's Tarbuck Bay water level gauge station that can be accessed live online at https://www.mhlfit. net/Station-209465 (NSW Coastal Data Network Program, NSW Department of Planning, Industry and Environment).

GIS map showing the key linear features being timber objects (orange polylines) and tramway formation alignment (dotted yellow polyline) recorded with centimetre accurate GNSS GPS.

GIS map showing metal detector 'hits' (red stars) in relation to key linear features - timbers (blue polylines) and tramway formation (dotted yellow polyline) recorded with centimetre accurate GNSS GPS.

View, looking east, of the remains of the fire-tube boiler on Tramline Beach. Range pole scale 20 cm graduations. Photo: David Cameron

Above: View looking north along the tramway formation with boiler remains (centre) and the partially submerged log landings #5 and #4 on the top left. Water level 0.495 m AHD. Photo: David Cameron **Below:** View looking south over log landing #4 with tramway formation sleeper bearers on left centre running up the beach with landing #5 at the waterline. Water level of 0.274 metres AHD. Photo: David Cameron

An Angourie Surprise (LR 281)

Readers of our article in LR 281 would be aware that we tentatively identified the four-wheeled locomotive abandoned beside Angourie Road near Yamba, NSW, as built by Parkinson and Monaghan of Sydney in 1870. Since publication, more information has emerged. This letter puts forward a strong case that the Angourie Road locomotive is a product of the English builder Henry Hughes and Co.

The locomotive was abandoned following its employment on the Clarence River navigation works. We think that it was the one that had been acquired by the Public Works Department, probably in 1874, for use at the Clarence. We stated a belief that the locomotive did not bear any resemblance to the products of any known overseas builder. This was after canvassing the question with industrial locomotive researchers in the UK, and led us to a tentative identification of it as the 1870 product of Parkinson and Monaghan (or their successors Parkinson, Monaghan and Co).

No sooner had LR 281 gone to print than we came across a photo from the 1860s that got us thinking. It shows two locomotives outside the workshops of Henry Hughes & Co, a locomotive builder in Loughborough, Leicestershire, UK which have some similarities with the Angourie Road locomotive.

Henry Hughes advertising was locomotives in the early 1860s but does not appear to have been a prolific builder. The history of the company is somewhat obscure with few if any records surviving and no clear knowledge of how many locomotives were built, or even exactly when locomotive construction commenced. In 1877, the company became the Hughes Locomotive & Tramway Works Ltd. In the 1880s, it evolved into the Falcon Engine & Car Works and later the Brush Electrical Engineering Co.

As a result of our examination of the Henry Hughes photograph, contact was made with Russell Wear, the Chairman of the Industrial Locomotive Society in the UK. Russell and two of his colleagues are working on a book on Henry Hughes locomotives.

On seeing a photo of the locomotive on the Angourie Road, Russell and his colleagues had little doubt that it was a Henry Hughes product. Identification points noted by Russell and his colleagues include the smokebox

Two Henry Hughes contractor locomotives in the works yard at Loughborough, the location confirmed by the footbridge in the background. Photo posted to Facebook by Killian Keane

Abandoned on the Angourie Road. The wheels are obviously different in design to those shown above. Could the hole in the cab side sheet correspond to the former position of a builder's plate?

Photo: Port of Yamba Historical Society

design, the style of the saddle tank and its supports, the cab side sheet and handrail, the running plate with no vertical edging, the brake, the cylinder, slide bars, crosshead and connecting rod.

This positive identification reminded us of evidence dating from 1864 of a previously unidentified locomotive. Contractors Larkin & Wakeford were awarded a contract by the NSW Government to build the formation of a 5-mile section of the Great Southern Railway between Mittagong and Wingecarribee, near Bowral, in June 1863.1 This included the 572-yard Gibraltar Tunnel through the Merrigang Range. In May 1864 it was reported that a locomotive was on its way out from England for the tunnel works.2 Many years later it was recalled that it had been used to haul away the waggons of spoil at the north end of the tunnel, which was completed around June 1866.3 After this it is likely that it was used by Larkin & Wakeford for tracklaying on this and the adjoining sections between Picton and Tallong, a total distance of 31 miles. The contract for the tracklaying work was let in May 1866 but the required materials did not arrive from England until March 1867 and the whole length was not completed until around July 1868.⁴

What seems very likely to have been the same locomotive was later used by contractor Patrick Higgins on his 15-mile contract on the Great Western Railway in the Blue Mountains from Mount Clarence to Wallerawang. This contract was awarded in May 1866.⁵ A locomotive was present by August 1869 and had probably been in use at least six months earlier.⁶ The line opened in March 1870, and in February 1871 Higgins advertised for sale an English 10-ton 11-inch locomotive.⁷

It now seems to us likely that the locomotive abandoned on the Angourie Road was the English locomotive imported by Larkin & Wakeford in 1864, that it was the English locomotive later used by Patrick Higgins when constructing the Lithgow Great Zig Zag, and that it was subsequently purchased by the NSW PWD. We do not know of any photograph of the locomotive with Larkin & Wakeford or with Higgins for comparison with the Angourie Road locomotive. Thanks to Russell Wear and his colleagues, and to Richard Horne, Bruce Macdonald, John Kramer, Chris West and Ron Madden for their valued assistance. As always, further facts and comments will be most welcome.

Jon Henry & John Browning Brisbane

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Tramline, Cascade Pier, Norfolk Island photo (LR 256)

A photo that appeared in conjunction with an article on "Norfolk Island" in the *Australasian* of 31 May 1924, p 66, gives a clear look at the gauge of the tramline, that may assist in determining its gauge.

Ron Madden via email

Editor's Note: Thank you Ron. The editors have examined the image and did not feel very confident in naming the gauge. However, they did note an image at the Australian National Maritime Museum in the McIlwraith McEacharn collection ANMS0850[033] and are now leaning towards 3ft 6in. Have readers noted any photos in their researches that may help determine the matter?

Tasmanian Main Line Railway Reviewed history and locomotive updates Part 1 – Early history and the Fox Walker locomotives (LR 272)

A small correction is required concerning the arrival date of the two Fox Walker locomotives. The *Westbury* barque that brought them to Launceston arrived on 20 September 1872, according to the *Tasmanian Tribune* of 23 September, and it appears that they were landed in the first week of October. On 9 October, the *Cornwall Chronicle* reported that Clark, Punchard & Reeve had applied to the Launceston Municipal Council for permission to erect a second storage shed, this one 100 feet by 24 feet. It was to be erected to the western side of their existing one which according to the *Cornwall Chronicle* of 4 October, was 80 feet by 24 feet and situated on the north bank of the North Esk River.

John Browning

Annerley, Queensland

Caldwell-Vale and Purcell Engineering locomotives (LR 278)

Further to Bob Butrims' letter (LR280) regarding the Australian Portland Cement Company's Purcell locomotive, readers might find the attached images of interest – these are from photographs previously exhibited in the Cement Works Museum at Fyansford before its closure.

It appears from the captions that the locomotive was known as "Biddy" at the

works and, as Bob indicated, was used on the tunnel construction. It certainly appears very worse for wear in these shots – which may explain why it did not find a buyer!

David Price

(Former President and Chairman - The Bellarine Railway) via email

HMAS Cresswell breakwater tramway (LR 253)

Following the publication of my article I have had further discussions with staff on the site, they have turned up some further information that relates to the railway, in particular some photographs that have been recently added to the HMAS *Creswell* Museum collection. The details are as follows.

BIDDY RAIL MOTOR USED TO BUILD RAILWAY LINE AND TUNNEL WORKS TO QUARRY

Creswell Quarry: From the 'Ferguson Collection' of 70 photographs taken by Alexander Ferguson, the original chief engineer when the College was being built. Loco 530: From the 'Logan Collection' of photographs taken by David Logan, who joined the Royal Australian Navy in 1926 when he was aged 16. Given the amount of vegetation in front of the locomotive, this photograph is likely to have been taken some time after it was last used.

Loco 530 today: Photo taken on 17 November 2021. The Yass Railway Museum was closed and the photo was taken through the wire fence. It was a very sorry sight. There is no evidence of any recent restoration work having been done. The Museum has virtually no resources and it seems that 530, along with other exhibits, have just been left to rust.

Photo of the railway and quarry with "a horse drawn narrow gauge". This photo shows something I was not previously aware of, and it appears to be a narrow gauge tramway that was used to carry building materials around the College site during its construction. Given what is shown in the wagons, the track was no doubt connected to the quarry. The rather primitive brake for the wagon wheels is particularly interesting. This photograph raises many questions to which I will have to find answers! I will be in further contact with the Museum.

Peter Crabb via email

Editor's Note: Thank you Peter, for the update and very interesting photos. The 2 ft-gauge construction tramways at RANC Jervis Bay were mentioned in passing in an earlier Letter to the Editor (LR254) and would certainly appear to be an excellent research project. It seems the Wollongong City Library also has a number of photographs that might be worth investigating.

Lacrosse Island and remote tramways (LR281)

I really enjoyed the article on the lighthouse tramway at Lacrosse Island in LR 281. It is good to see one of our more unusual lines recognised.

Further to the author's final comment in the article about remote tramways, I would submit the following thoughts. Eucla is about 110km in a straight line from the Trans-Australia Railway; Israelite Bay (jetty tramway) is about 180km in a straight line east from Esperance, its closest line. I was also thinking about the Cape Inscription lighthouse tramway on Dirk Hartog Island but it is only 75 km from Denham (jetty tramway) but about 110 km from Carnarvon. Vlamingh Head lighthouse tramway is about 110 km as the crow flies from Onslow (old and new) while Onslow is about 150 km from its closest iron-ore railway. The Wittenoom asbestos mine is not very far now from iron ore lines but before they were built it was about equidistant (220 km) from Roebourne and Port Hedland though a little closer to Whim Creek (150 km). Browse Island, as mentioned by the author, would be hard to beat in WA (350km or so from Derby).

There are likely some very remote mine tramways (apart from Wittenoom) such as at Nullagine but they could be close to other mine tramways if there was a bit of a mining field.

And of course, another line of thought would be WA/Australia's remote territories at Christmas and Cocos (Keeling) Islands.

I would be interested in any other thoughts on this matter from readers of LR. [So would I – Ed.]

David Whiteford Via email

Illuka Quarry (various issues of LR, mainly 248)

Following on from the various issues on breakwaters, I came across the attached note from Clarence Valley Council in an eNewsletter that came my way.

Iluka breakwall repairs (26 November 2021) The Iluka breakwall and hardstand area will be closed to the public from Monday 29 November for up to one week while repairs are completed by Transport for NSW.

The repairs will include resurfacing and the filling of large voids in the wall.

Works on the Yamba breakwall are expected to be completed today.

Perhaps your readers will find this interesting.

Ken Littlefair via email

Confidence Saddle tramway (LR 281 and LR 282)

The last two editions of LR contain letters (from James Shugg and Jim Stokes) explaining the confusing issue of nomenclature of Wallace's Tram / Confidence Saddle Tram, a spur line from Confidence Saddle on the North East Dundas Tramway.

I may be able to shed a bit more light on this.

George Dunkley (Dunkley Bros Sawmillers) applied in February 1918 to the Tasmanian government for a loan to construct a tramline starting 12 miles from Zeehan on the North East Dundas Tramway, at Confidence Saddle, to access timber and mineral wealth in the area. It was mainly King Billy Pine (*Athrotaxis selaginoides*) for its use and to cart ore from Wallace's mine on the edge of Godkin Ridge.

Clearly George Dunkley 'over egged' the timber and mineral wealth of the area.

The loan of $\pounds 2000$ was approved by an Act of Parliament in December 1918 and overseen by the Public Works Department (PWD). Additional royalties above those already imposed on the timber and minerals extracted was required to pay back the loan over a period of three years.

During 1919, a PWD engineer from the Stanley - Trowutta railway, Mr F P St Hill, inspected the progress a number of times. He reported that a blacksmith shop, four huts, and an 8-stall stable had been constructed at Confidence Saddle. His last report, in September 1919 stated that the line had reached the site for huts and stable to be constructed (the area we call the Junction i.e. junction of the tram and Carbine Track). Some King Billy pine had been cut and carted during construction and one truck of ore from Wallace's (5 ton 15 cwt) being the only reference to ore being carted out. This most likely did not come from Wallace's Prospect but a different lease (see Jim Stokes' letter).

Between 1919 and 1926 some 2676 King Billy logs (882,000 super feet) were taken out along with 106 myrtle logs (27,000 super feet). George Dunkley died in 1926 and the loan was in arrears to the tune of £1686 and thus he never met the 3-year terms. A three year extension was sought and granted but not beyond 1926. A further extension would have required an Act of Parliament but eventually the crown foreclosed in October 1926.

But now fate intervenes.

John Howard took over the lease but did not work the area and the tramline fell into disrepair.

EZ informed the Government in June 1929 that the extension of the North East Dundas Tramway from Williamsford to Rosebery (already surveyed) would not be required as it had decided on an aerial ropeway. This sealed the fate of the NEDT, which closed in April 1932, though the Government kept it going to the 5 mile Copper Nickel as there were mines in operation there. Joe O'Brien, who had taken over Dunkley's local operation won the tender to use the line exclusively from the 5 mile but also all the way from Zeehan to Confidence Saddle. Jim Howard's father, John, who died in 1928, had taken over Dunkley's lease and Jim eventually operated the Confidence Saddle horse-drawn tram and set up a mill at Fraser Creek. I cannot locate details of the super feet of King Billy pine taken out by Jim Howard but they operated there from 1932 until late 1938. There is at least halfa-kilometre of moss covered offcuts beside the tramline as you approach Fraser Creek Hut. The mill was over the creek so the sawdust simply went down the creek. They also used the huts and stable at the Junction. Joe O'Brien sold up and departed the area in 1934 and Jim Howard took over the lease on the section of the NEDT from the 5 mile to Confidence Saddle as well as retaining the Confidence Saddle Tram. The tramline is 2 ft gauge and there is some steel, but it is mostly King Billy sleepers and rails.

Maintenance must have been constant as Jim's workers walked in from Dundas via Carbine Track. This track goes from Dundas to Ringville and predates the NEDT and it traverses the Curtain-Davis mines.

So, the official Government name for this spur line is the Confidence Saddle Tram. It is often referred to as Dunkley's Tram but there was already an operating Dunkley's Tram out of Zeehan. I am responsible for the sign at the Junction labelling it Wallace's Tram. My information in the late 1970s came from mining company exploration maps, which also named all the local mines.

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The information came from Government Geologist's reports, and obviously geologists have no interest in logging / milling operations with files with PWD, Forestry, Railways and so they referred to it as Wallace's Tram, which name has stuck.

Now where do I come into the picture ?

After Jim Howard departed, Bill Higgins used their workshop at Fraser Creek beside the sawmill as a live-in hut while he and his two tributors worked Wallace's Prospect in 1950 - 53. The ore was Jamesonite and they used a draught horse to drag the ore (13 tons in total) on a sled down the tram line then down Carbine Track to Dundas.

Steve Berrigan, Forest Assessor based in Queenstown came across the tramline and hut whilst researching King Billy seed sources in the 1970s and did some restorative work.

I was the Scout Leader in Queenstown in the late 1970s and Steve told me of the hut suggesting Scouts may like to use it. I enlisted Roger Nichols, the Scout Leader in Zeehan at the time, and we slowly renovated the hut and it has been in constant use since - it is registered to the Scout Association.

I did keep the tram line formation open, but it became too onerous so subsequently only kept the Carbine Track and the section of tramline from the Junction to Fraser Creek Hut, but the full length is walkable albeit with tree falls and decaying small bridges.

For decades before Department files were available on-line, I tracked down the Confidence Saddle Tram file in the Archives with some kind assistance from staff there. A few observations:

It is most definitely Fraser Creek and not Frazer Creek. Dr Fraser was a mining investor / speculator from Melbourne in the 1890s.

The efficacy of horse operation, tree size, distance, terrain, and weather meant that many large King Billy trees were left behind. They were barrel straight with no low branches and seedlings abound. There have been some crowning fires but most

Editor's note

John Browning and John Peterson have noted that the John Scholes Transport History Prize competition in the UK for 2022 is now open with a deadline for submissions of 31 July 2022. Any interested authors can obtain more information at: https:/journals.sagepub. com/page/jth/john-scholes-prize

remaining trees have survived albeit scarred. The men had it tough but I feel for the horses, as all their feed had to be brought in. The following was written on a King Billy board at the hut in millers blue crayon "Frosts started 1 June, finished 5 July 1937" with '35', indicating the days, in a circle.

Luckily the 'dozers did not go too far up Carbine Hill or in from Confidence Saddle. So much damage to historical tracks and tram lines was done by mining company exploration teams during the 1970s getting drill rigs into this highly mineralised area. The canopy has now closed in so recent aerial photographs do not pick up the Tramway or Carbine Track, simply the bulldozed / 4x4 sections at the beginning of each. Fraser Creek Hut survived due to two factors whereas the structures at both Confidence Saddle and the Junction soon fell to the elements. Fraser Creek Hut was built at least 10 years after the others and it had infrequent but some use over the decades.

Hopefully all of this goes some way to filling in the gaps in the recent correspondence relating to the Confidence Saddle Tram.

The historical information comes from Tasmanian State Archives PWD 243/1/78 N.E.Dundas - Confidence Saddle Tram and AB455/1/127 Closing of N- E Dundas Tramway and TC10/1/3608 North - East DundasTramway - lease offer.

Terry Reid via email

Left: Two youngsters at the Junction of Confidence Saddle tram and Carbine Track at the headwaters of Great Northern Creek. **Right:** The tramway covered in snow during November 2021 on the climb to the watershed between Great Northern Creek and Fraser Creek. Both photos: Terry Reid

LRRSA members on line meetings

The LRRSA will be holding regular members meetings on line via Zoom conferencing on the dates below. Members wishing to "virtually" attend will need to pre-register by responding to an email inviting you to attend or via our website Irrsa.org.au. After registration, details of how to join the meeting will be provided to those that have registered.

February 2022 Members Zoom meeting

Date: Thursday 10 February 2022 at 8.00pm AEDT John Browning will make a presentation titled "A survey of local government, private and industrial railways in Queensland". This promises to be a fascinating subject and you are encouraged to book early to avoid disappointment.

April 2022 members Zoom meeting

Date: Thursday 14 April 2022 at 8.00pm AEDT Frank Stamford will make a presentation of the ARHS Victorian Division tour of Queensland that was held in 1964. The presentation will include details of what was included in the tour with special emphasis on sugar tramways and the quirky and unusual.

BRISBANE: "Indonesian sugar mill tramways"

Ross Sadler will present a DVD showing some more Indonesian Sugar Mills. Attendees are also encouraged to bring any DVD's of light railway interest for viewing.

Location: BCC Library at Coopers Plains. Date: 18 February 2022 at 7.30 pm

SYDNEY: "The Mortlake gasworks railway"

Noted historian Mark Langdon is researching the 3ft gauge railway system once used at Mortlake gasworks, Sydney. AGL first purchased land in 1883 beside the Parramatta River. Gas coal was carried by ship from Newcastle to their wharf. The railway possessed six narrow gauge steam locomotives to haul coke from the retorts. A telfer system was also used. The railway lasted until 1948. Mark will present a detailed overview of the history and operation of the gas works.

Location: Woodstock Community Centre, Church Street, Burwood. Free Council car park behind building (entry via Fitzroy Street) or close-by street parking. Only 10 minutes easy walk from Burwood railway station.

Date: Wednesday 23 February 2022 at 7:30pm NOTE: Due to the Covid precautions the large meeting room at Woodstock (Penfold Room) will be limited to 14 attendees for safe spacing requirements. Please contact the Secretary (0415995304) in advance if wishing to attend.

MELBOURNE: "No meeting"

There will be no meetings in Melbourne until further notice.

ADELAIDE: "Military Road light railway revisited" The SA group will be meeting for further discussion on the Military Road light railway. Accommodation is limited, so contact sa_ group@Irrsa.org.au if you have not been to a meeting before.

Location: 1 Kindergarten Drive, Hawthorndene Date: Thursday 3 February 2022 at 7.30 pm

Heritage & Tourist

News items should be sent to heritagetourist@ Irrsa.org.au Digital photographs for possible inclusion should be sent direct to Richard Warwick at editor@Irrsa.org.au including the name of the location, the name of the photographer and the date of the photograph.

QUEENSLAND

FRIENDS OF ARCHER PARK STATION AND STEAM TRAM MUSEUM, Rockhampton 1067 mm gauge

The end of year boiler inspection and non-destructive testing (ultrasound) on the tram was scheduled to commence on Wednesday 1 December 2021. Volunteers disassembled the tram in preparation for the work to see the wear and tear on the boiler as it gets close to needing a replacement. After the inspection, the usual end of year maintenance on all the Museum's operational rollingstock was to be carried out. *Tram Tracks*: Volume 15 Number 5 1 November 2021

BALLY HOOLEY RAILWAY, Port Douglas 610 mm gauge

The final piece of the Bally Hooley scheme has fallen into place with the arrival of *Bundy* to Choo Choos restaurant at the Marina. *Bundy* joins *Speedy* and *Nelson* at the station and while there remains a small amount of restoration work to be done on *Bundy*, the locomotives are currently in position where they will remain on display in perpetuity. *Bundy* was commissioned by the Mossman Mill in 1952 and built in Bundaberg by Bundaberg Foundry.

Owner of Choo Choos and the person responsible for the restoration, John Morris, has said that they have managed to preserve the history forever. "This completes the display and they are in perfect condition. It's fantastic that the public and visitors to the region will now be able to view this fascinating piece of history forever," Mr Morris said. "If anyone else has any memorabilia they're wanting to display, please get in touch. We'd love to take a look."

Mr Morris also said that there are plans to bring another steam locomotive and a carriage that belongs to the Douglas Shire Historical Society, to rest across the road opposite the marina. Jereme Lane, *Newsport* (on-line newspaper) 17 November 2021

Bally Hooley locomotives at the new restaurant in Port Douglas Top: Having just arrived on the back of a low loader truck, Bundy is lifted by crane to its new position on display. **Centre:** Nelson is located on the former turntable at the end of the line with Speedy and its carriages in the background. **Above:** Speedy at the platform of Choo Choo's with its covered in carriages containing the restaurant seating. All photos: Adrian de Kuyer

(Many people may have preferred the railway to keep running as inevitably these locomotives and carriages will deteriorate in the Queensland weather. H&T Ed.)

BUDERIM-PALMWOODS HERITAGE TRAMWAY INC., Buderim

762 mm gauge

Damian Collins from Buderim Design Studio has designed several proposed display buildings for the Krauss loco since 2009 and is now in the process of designing the final one which the BPHTI is confident will become a reality on the site next to Buderim's Old Post Office.

However, Damian had never actually seen the Krauss so it was arranged for him to have a close-up view of the locomotive. Damian's father, Terry, was a steam train driver with QR so he came along as well and gave viewers a run-down on how it all worked. They were both very impressed with the restoration and the painting of Krauss 6854 and, like all members at BPHTI, cannot wait to see it displayed in Buderim.

While there, the opportunity was taken to install a tarpaulin across the front of the shed to protect the locomotive from the weather while it is waiting to go into the new display building. BPHTI Facebook post 24 November

GULFLANDER, Normanton

1067 mm gauge

The vintage railmotor RM60 which was built in 1931, has been lovingly restored and takes visitors on short excursions from Normanton Station. Gulflander Facebook post , 3 December 2021

NEW SOUTH WALES

TIMBERTOWN HERITAGE PARK, Wauchope 610 mm gauge

Timbertown locomotive *Petrie* (Fowler 0-4-2T 19930 of 1933) is for sale although it needs a full restoration, including a new boiler. Timbertown had nothing to do with it ending up in this condition as the company bought the locomotive two years ago in its current condition, and realistically does not have the time or money to carry out the restoration. Timbertown paid a reasonable price for it and seek only to retrieve those funds in the sale, although the company would entertain a payment plan or something similar. It would love to see it restored but if there is no interest in the sale, it will be preserved as is until funds can be allocated.

Since the above was written, it has been advised that *Petrie* has been sold, and that it will remain in Australia.

David Waite, Timbertown Heritage Park Facebook post, 2 December; Light Railways of Australia Facebook Group 18 December.

ZIG ZAG RAILWAY, Lithgow

1067 mm gauge

As part of the upgrade of the Zig Zag Railway, works continue with the carpark upgrade. None of this important work would have been able to have taken place without the support of a \$2.3m grant announced in November 2018 by the NSW Government and the local member. By the time passengers next arrive for a trip on the completely rebuilt railway, they will notice the difference; instead of a dry and dusty car park there will be a fully surfaced site for parking. Facebook page, 7 December

LITHGOW RAILWAY WORKSHOP, Lithgow 1435 mm gauge

Most of us are familiar with the Zig Zag Railway at Lithgow, but at Bottom Points is the Lithgow Railway Workshop, doing valuable restoration work on a variety of standard gauge and narrow gauge rolling stock and locomotives. While repairs and maintenance to commercial locomotives and freight wagons is LRW's core business, not many people know that about 10% of its business is repairing heritage passenger carriages. The carriage works began work in 2015 and in an effort to keep the dying trade of Car and Wagon Builder alive, it currently has three apprentices.

Its main job this year has been refurbishing five timber ex Queensland Railways "Evans" cars for Zig Zag Railway. This involves removing the old perished matchstick sides, replacing all rotten timber, making and fitting some new windows, renewing sections of rotten floors and joists, fitting new matchstick sides, sanding and painting interiors and installing automatic solar lighting systems. Work has just commenced on the last car, which should be completed by mid-December. This car is taking longer than the other four, as workers have also been tasked with converting it from a dog-box to a centre aisle arrangement to match the other cars. External painting and roof coverings were performed by others.

Lithgow Railway Workshop Facebook post 3 October 2021

ILLAWARRA LIGHT RAILWAY MUSEUM, Albion Park

610 mm gauge

The ILRMS, like all museums has closed to all visitors over the last six months and opened with Steam & Miniature Rides on Sunday 12 December 2021 for the traditional Christmas train run "Catch the Christmas Train".

Over the last six months a skeleton local crew has been able to do essential maintenance around the train park to make the museum a welcoming venue on reopening for all.

Locomotive Kiama (Davenport Locomotive Works 0-4-0ST B/N 1596 of 1917) passing through the bush setting at the ILRMS Museum at Albion Park during September 2021. Photo: Brad Johns

Milestones in the ILRMS History show that on 15 December it will mark 50 years since the public meeting held at the former CWR Hall in Wollongong for the formulation of a light railway museum on the South Coast Region of NSW. The meeting was called by the ILRMS Founder Tony Madden and as history shows, the meeting was well attended. The ILRMS marks another milestone in February 2022 which marks 50 years since the Society's foundation and to honour the commitment of those early years, sometime in 2022 the Society will be holding a special event to mark the milestone. It should be noted that February 2022 was planned but due to Covid all has been placed aside as the Society rebuilds. Successful events prior to the Covid closure in 2021 had seen the traditional Trains and Planes Sunday, the Tongarra Train Fest, and Kids fest Shellharbour with other operational days a success for all.

Brad Johns, ILRMS, Albion Park

VICTORIA

ALEXANDRA TIMBER TRAMWAY AND MUSEUM, Alexandra

610 mm gauge The tramway returned to steam on Sunday 14 November 2021. Stephen Watson Facebook post 14 November

Top: John Fowler Number 5, 0-6-0T (Builders number 11885 of 1909) at the Alexandra Timber Tramway simmers away getting ready for another days operations on Sunday 14 November 2021. Photo: Peter Evans **Above:** Waiting at the station platform at Alexandra, Peter Evans opens the firebox door on locomotive 5. Photo: Stephen Watson

CARRIBBEAN GARDENS, Scoresby

610 mm gauge

James Shugg asked if anyone knew where the Caribbean Gardens Malcolm Moore locomotive ended up after the sale of assets in June. Replies regretted the fact that several bids were made but were not successful, including one for \$10,000 for the locomotive and carriages. One person offered more than that for the locomotive alone, but the owner's preference was to sell it as a package with the complete train. Another post on the page opined that very little was sold.

James Shugg, Facebook post 4 October 2021

PUFFING BILLY RAILWAY, Belgrave

762 mm gauge

Garratt G42 was recently moved from the Belgrave yard to the museum at Menzies Creek. The reason that G42 has been moved into the museum is that it is presently surplus to requirements (as there are no really heavy trains at present) and that it needs a scheduled exam before it can run again. As there is no time or workshop availability at present to conduct this exam, and because the locomotive was taking up space in the Belgrave yard and was out in the weather, it was decided to move it to the Museum where it could be viewed up close by visitors. Although it could have moved under its own power, it is out of ticket and so it was towed by DH59 to the Museum and parked in the most northerly road in the Museum.

Interestingly, the railway's other Garratt, NGG 16, No. 129, is being used to haul the railway's latest money-spinner, the Polar Express, which is an all singing, all dancing excursion of 16 cars which travels from Belgrave to Lakeside with a stop at Menzies Creek. Actors give a performance on the platform at Belgrave before departure, at Menzies Creek and again at Lakeside where the new Visitor Centre is incorporated into the show. The train is proving to be very popular and seats were sold out very quickly.

In December, during what once was the busy period with every day running, some trains have been cancelled due to insufficient volunteer crew numbers. Volunteer numbers have dropped away alarmingly since they were required to be fully certified ETRB volunteers. Hopefully this situation will be improved in the new year. Andrew Webster, site visit 17 December 2021

WALHALLA GOLDFIELDS RAILWAY, Walhalla

762 mm gauge

Fortunately, a recent volunteer on the railway has taken over the supervision of the railmotor project after the original leader reluctantly had to step down. This is fortunate since the railway needs to finish the project before it can go to seven day running. Numbers of passengers continue to be good after all rectification work was completed after the flood damage. Andrew Webster, site visit 12 December 2021

LIGHT RAILWAYS 283 FEBRUARY 2022

TASMANIA

IDA BAY RAILWAY, Lune River

610mm gauge

Following the Huon Valley Council's refusal in September of the DarkLab development application to build a visitor centre and cafe at the Ida Bay workshops (to service a proposed art installation a few hundred metres to the west), DarkLab indicated that it would not appeal but will seek a new location outside of the heritage railway precinct. Consequently, the Minister for Parks, Jacqui Petrusma, who is also the local state MP, asked the CEO of the Parks and Wildlife Service, custodians of the publicly-owned railway, to give the Ida Bay Railway Preservation Society a five year, renewable licence to restore and operate the railway. At the time of writing this third attempt at a suitable licence had not been finalised, but the draft terms negotiated at a series of meetings just prior to Christmas are much more favourable than those previously on offer, when DarkLab was the priority proponent for the Ida Bay workshop area.

In anticipation of the licence being agreed, Parks granted the Society a series of one day permissions to hold working bees, meetings and the members' Christmas lunch at the Ida Bay depot. At the most recent of these on 11 December, the two dozen keen volunteers spread across the site to record and photograph the inventory of rolling stock and other gear, to note the condition of the buildings, and assess the state of the rail infrastructure. This information will form the basis of the Society's works plan, which envisages a staged restoration of the railway to a standard that meets current regulatory requirements.

When will trains be running at Ida Bay? It would be unwise to try to predict when paying passengers will be carried again on the railway, but the Society's steering committee is optimistic that the accreditation process will be sufficiently advanced such that the rail regulator allows non-commercial rail movements (ie works trains) at the western end of the railway by this time next year. Wheels have not turned at Ida Bay since October 2018. James Shugg

WEE GEORGIE WOOD RAILWAY, Tuliah 610mm gauge

A special operating day in in conjunction with a fishing competition in Lake Rosebery saw *Wee Georgie Wood* carry an all time record 153 passengers in a single day in mid-October.

Top: Krauss loco at East Victoria Street station on the Redwater Creek steam railway, running on the chassis of b/n 5800. **Above:** On 23 November 2021 Mt Lyell Mining and Railway Co Abt loco No. 1, which was built in 1896, was recently returned to service on the WCWR after an extended period of repair, just in time to celebrate her 125th birthday. She is seen here on the turntable at Queenstown. Both photos: James Shugg

This was on the last weekend of the school holidays; state-funded travel vouchers, largely captive local tourists with borders closed to Melbourne and Sydney, many visitors from Queensland, SA and WA, and increased WGW presence on social media were all factors at play. By December, numbers had drifted back to around 60 per weekend, just ahead of borders reopening on 15 December and school summer holidays commencing shortly thereafter.

Representatives of the Office of the National Rail Safety Regulator (ONRSR) inspected operations at Tullah in November. Their visit went well by all accounts. The Fowler's annual boiler inspection also took place that month, and the inspector had high praise for the boiler's condition. *Georgie* received a new boiler in 2012, which has proven trouble-free in operation with the right dose of anti scaling preparation when in use and careful dry storage during the winter operating hiatus.

Arrangements are well in hand for *Georgie's* visit to Steamfest in Sheffield over the March long weekend (12-14 March 2022). The Fowler locomotive will be accompanied by two carriages, one ex the Mt Lyell Comstock tramway, and the other recently constructed by members of the Wee Georgie Wood Steam Railway on the chassis of a former North East Dundas Tramway bogie flat car. The Nicola Romeo petrol loco and green carriage, both ex the Lake Margaret Tramway, will fill in for passenger duty at Tullah for the operating weekend the steam locomotive and train is expected to be away. Trains usually operate on the first and last weekend of the month at Tullah, until April.

In January, the Royal Australian Mint was expected to announce that *Wee Georgie Wood* would feature on a limited edition colour 50 cent coin, as the Tasmanian representative on a series of coins commemorating the steam railway era in Australia. James Shugg

REDWATER CREEK, Sheffield

610mm gauge

The Krauss locomotive continues to operate trains on the first weekend of every month, with extended operations planned over the summer holidays. Observant readers will note the similarities between the Krauss b/n 5800 photographed by JLN Southern in 1937 at Confidence Saddle (see LR 282 p40) and the Sheffield Krauss, which is actually a composite rebuild of the bottom half of 5800 and the boiler. cab and cylinders of former Sandfly/Ida Bay Krauss b/n 5682, which was originally a 2-4-0T. The ex Babinda Malcolm Moore b/n 1011 of 1943 has received a new roof, fabricated by its regular driver, in time for summer operations. The ONRSR also visited Redwater Creek in November and that seemed to go smoothly.

Plans for Steamfest 2022 are well in hand. The railway component of next year's event promises to be exciting, with the Krauss and visiting *Wee Georgie Wood* hauling two trains throughout the three day event, crossing at the Dulverton loop and station. Here, a station master will handle

safe working arrangements, passing the staffs for the two sections between drivers. At last year's Covid safe event, nearly 2000 people rode the train; hopefully passenger numbers will be even higher this year. James Shugg

DERWENT VALLEY RAILWAY, New Norfolk 1067mm gauge

The DVR plans to recommence operations on a short section of the former Tasmanian Government Railways branch line from June next year, after being granted a lease on the line, that will hopefully be extended over time. Of particular interest to Light Railways readers will be the former Emu Bay Railway No. 22, an 0-8-0DH that initiated the replacement of steam by diesel on that railway from the mid 1950s. After nearly 50 years service at the EBR, mostly spent shunting at Burnie, No. 22 travelled under its own power to New Norfolk where it entered preservation twenty years ago. Infamous for its long rigid wheelbase, basic suspension and consequent bone shaking ride, this unique locomotive is currently in the workshops receiving attention to the transmission. At the same time, the locomotive is being repainted, to better reflect the livery it carried earlier in its EBR service.

James Shugg

WEST COAST WILDERNESS RAILWAY, Queenstown

1067mm gauge.

The Advocate newspaper reported that on Monday 19 November, one of the diesel locomotives partially derailed while hauling a passenger train at low speed at Camp Spur. This location is about 90 minutes by rail from Strahan and inaccessible by road, so it took some time to ferry passengers out by hi-rail vehicle. Wilderness Railway boss Anthony Brown speculated a combination of diesel locomotive rigidity and "corners that [aren't] as smooth as a sweeping" curve may have been factors at play. The diesel locomotive is back in service, but visitors have reported it hauling the passenger train "in reverse" (cab-leading) recently.

On 23 November, a new museum was opened at Regatta Point (Strahan) station. The same day, there was a birthday celebration in Queenstown. Mt Lyell Mining and Railway Co. Abt loco No. 1 was built in 1896. She was recently returned to service on the WCWR after an extended period of repair, just in time to celebrate her 125th birthday. Queenstown was bathed in sunshine and while No. 1 was displayed on the turntable, half the town turned up for cakes in the station. James Shugg

GREAT RAIL EXPERIENCES TASMANIA, March 2022.

The Tasmanian Association of Tourist Railways is a volunteer run non-profit group that advocates on behalf of the tourist and heritage railways in Tasmania. The Tatrail committee comprises representatives from most of the Tasmanian rail preservation societies. For some years now

The west end of the Light Railway Centre at Milang after the platform was opened. Photo: Caleb's Rail Films

Tatrail has run Great Rail Experiences Tasmania, which aims to showcase Tasmania's rail heritage over a 12 day tour. The October 2021 tour had to be postponed till March due to Covid, and there are still some places available. All of the state's operating railways in this edition of Heritage and Tourist News, and many more, will be visited, as well as several of Tasmania's iconic "off-rail" attractions.

Here is a link to the itinerary: https://www. tours.greatrailexperiencestasmania.com.au/ itinerary-2/

SOUTH AUSTRALIA

MILANG RAILWAY MUSEUM, Milang

1600 mm and 610 mm gauge The cosmetic restoration of the 1927 Fowler No. 17683 has been completed with the fitting of the missing valve gear on the right side. On the left side there are signs of a major mishap with a bent coupling rod and missing cylinder head. It is going to be left that way so that visitors can speculate on what may have happened. A works plate has also been fitted. This was drawn up using measurements from other Fowler locomotives and was 3D printed in ABS plastic. At the end of November, the biennial model railway show was held which was very well attended and financially successful. On the Sunday, the official opening took place of the new platform on the two foot gauge munitions railway. The platform was funded by a Royal Automobile Association grant and so they were present at the opening. The 1938 Ruston Hornsby diesel locomotive also did demonstration runs. The munitions railway consists of a 1942 BEV battery locomotive, now fitted with connecting rods, and two 1940 Islington built munitions wagons. The latter have been converted to passenger use by the addition of Volvo bus seats, a roof and safety

measures. At present the railway only runs for 150 metres but will soon be extended to cross a broad gauge turntable, which will be fixed in place for use as a bridge.

Peter Lucas, Secretary, Port Milang Historic Railway Museum Inc.

WESTERN AUSTRALIA

BENNETT BROOK RAILWAY, Archer Park 610 mm gauge

The Railway had a very good October this year. School holiday passenger numbers were strong and weekend passenger numbers were good as well. The Fowler wheels have been returned and placed back under the chassis and the drive rods partly connected. Half the carriage fleet has had lights and high-quality public address speakers installed. Half the scissors crossover point motors have been installed and commissioned and the southern colour light signals are working. ZB 213 has had all the safety critical issues corrected and is right for general traffic. All these items culminated on 30 October with a "Let there be light" evening where the Fowler, the ZB, the Village Junction signals and the carriage lights were on display for members to see as they socialised on the evening. Work will soon be starting on replacing the decking on the Village Junction turntable (subject to the availability of the required decking materials). Design work is also well underway on the new ballast tamper.

The Bennett Brooklet, November/December 2021

LRRSA Facebook Group Have you joined the LRRSA Facebook page, titled *Light Railways of Australia* yet? Lots of online discussions and photos of light railway interest.

End of the Line – Silverton Tramway

The Silverton Tramway Company opened their railway, from Cockburn to Broken Hill on 12 January 1888. Of 3ft 6in-gauge, it connected with the South Australian Railways at the SA/NSW border and linked the "Silver City" with Port Pirie for ore traffic. For Adelaide-bound passengers or goods there was a break of gauge at Terowie. Broken Hill was just 27 miles (as the crow flies) inside NSW and, at the time, effectively a million miles from Sydney. Virtually all trade would be with South Australia, even after the NSW Railways' completed a through standard gauge connection with Sydney in 1927.

The reasons why the NSW government would not allow the South Australian Railways to build the 35-mile line from the border to Silverton and on to Broken Hill seemed to be purely petty parochial and related to the inter-colonial rivalries of the times. However, for the STC's first five years, NSW allowed the SAR to operate the trains to Broken Hill!

Over the years the STC operated at least 29 steam locomotives, of three main classes –Y,A andW.Most steam operations ended in 1961 with the introduction of diesel-electric locomotives. The STC's main line was abandoned in 1970, when the standard-gauge line was built as part of the East-West standardisation.

Eight years earlier, the late Weston Langford had visited the STC's Railway Town depot in Broken Hill on 29 December 1962 and recorded these sad scenes of dereliction.

Top: W24 Malcolm Moore (Beyer Peacock 7553/1951) a 4-8-2, now preserved at the STC's former Sulphide Street station, Broken Hill.

Above: Y14 (BP 3870/1896) a 2-6-0 now scrapped, though four Y-class locos survive, including Y1 at the Sulphide Street station museum.

Right: A20 (BP 5912/1915), a 4-6-0, scrapped in 1963. Its sister, A21 (BP5913/1915) is preserved at the National Railway Museum, Port Adelaide.

Photos: Weston Langford images 102220, 102222, 102224 courtesy www.westonlangford.com Images converted from colour to B&W. Captions: Phil Rickard

