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NEPEAN SAND: the railways of Yarramundi Falls

by Craig Wilson

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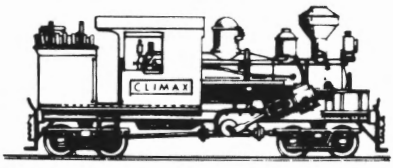

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Cover: *Emma,* ex-NSWGR M-class no. 1104, works a sand train up through Warnocks after climbing from the Nepean River, circa 1936.
Photo: Arthur Stell

Nepean Sand & Gravel Company Ltd.

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Light Railways is the journal of the Light Railway Research Society of Australia. The Society's members are undertaking research into the history of light railways in Australia and her territories. These include railways and tramways serving the timber industry, sugar mills and mines, construction tramways, industrial railways and narrow gauge passenger-carrying railways.

Articles, letters, book reviews, maps, photographs and drawings on topics of relevance to *Light Railways* are required for future issues. Comments on previous articles offering corrections or additional information are welcome for inclusion in our "Letters" columns. Written material should be typed with double spacing. Material should be sent direct to the editor.

Abbreviations

ABMQL	The NSW Associated Blue Metal Quarries Limited.
AIS	Australian Iron & Steel.
ARHS	Australian Railway Historical Society.
BMQL	Blue Metal Quarries Limited.
CB	John and David Carson trading as Carson Brothers.
E&PG&RMCL	Emu & Prospect Gravel & Road Metal Company Limited.
FBMQL	The Federal Blue Metal Quarries Limited.
MWS&DB	Metropolitan Water, Sewage and Drainage Board.
NS&G	Nepean Sand & Gravel Company Limited.
NSWGR	New South Wales Government Railways.
RAAF	Royal Australian Air Force.
RS(N)L	River Sand (Nepean) Limited.
SMQ	State Metal Quarries.
S&SBMQL	The Sydney & Suburban Blue Metal Quarries Limited.

NEPEAN SAND AND GRAVEL COMPANY LTD.

by Craig Wilson

Suitable quarry sites for sand and gravel in the Sydney region have been limited. Prior to the 1920s there were two main sources for the Sydney market: 'Mascot' or 'Rosebery' sand shovelled from the Botany sandhills into drays for delivery in Sydney provided cheap, if sometimes poor quality, material and its higher priced competitor 'Nepean' sand, dug in similar fashion from the banks and islands of the Nepean River to the west of Sydney. The Emu Boulder Company at Emu Plains had been one of the first to exploit the deposits on a large scale, barrowing sand directly into rail trucks as well as crushing the hand screened river stone, predominantly quartzite, washed down the Nepean River from the mountains behind.

Neither of these sources were large producers and it was not until the widespread use of reinforced concrete in buildings and for roads after the Great War that demand increased, especially for the quality river products.[1] The Emu Boulder Company, by then reformed as the Emu & Prospect Gravel & Road Metal Coy Limited, was the main beneficiary of the increased demand. Its sales grew from £27,677 in 1920 to £49,506 by 1924.

Entry into the industry for any new producer was difficult. It required ready access to either water or rail transport, as at this time road transport was not yet practical over long distances for large volumes. The New South Wales Government's commitment to build a branch railway from Richmond to Kurrajong gave another point of rail access to the deposits of the Nepean River. The authorising Act for construction was passed in 1919 but it was not until 2 June 1923 that the Hon RT Ball, Minister for Works and Railways, turned the first sod commencing the construction.

In the meantime a local resident, Mr W Percival, had obtained a mining lease over eighty five acres, part of a sand island at the junction of the Nepean and Grose Rivers called Yarramundi Falls. This was three miles to the south of the projected branch railway and, with the commencement of construction of the line, he sought in June 1924 to float a company named the Nepean Sand & Gravel Company Limited (Nepean Sand & Gravel).

ESTABLISHMENT 1924-1925

Mr Percival interested in participating in the float two companies in the Sydney building industry, James Hardie Ltd and Concrete Constructions Ltd, the latter then prominent in advocating and building concrete roads. Mr A Reid and Mr W Forbes respectively represented these shareholders on the company's board. The remaining directors were Mr Percival and Mr AA Stewart, a prominent professional director. It was a strong board, perhaps required in the light of the balance of the information disclosed in the prospectus. Shares worth £32,000 were offered for subscription. This was to be spent primarily on a private connecting railway (£13,760) and plant (£13,400) with a production capacity of 80,000 tons per annum. This left only £2,740 after vendors' expenses for 'working capital and contingencies', a small amount should the scheme strike problems before it was fully operational.[2]

The initial plan was for an aerial ropeway from the quarry site on the Island to a processing plant half a mile downstream on the eastern bank. From here the company's railway would run the two and one half miles to connect with the Kurrajong Railway. The planned limited use of rail transport is of interest in the light of later decisions. The Nepean River was the problem that the board foresaw. The river was particularly prone to flooding and a rail extension across the river would require earthworks and a three hundred yard bridge. These would be costly and susceptible to flood damage. Just what would be the effect of floods on a low level bridge was not fully known, at least not to the satisfaction of the board.[3] They therefore chose the safer course, of a plant on the river bank with a ropeway from the island. Thus the main plant would be immune from many floods with little risk of serious damage.

Construction

The next twelve months was to be a period of frantic preparations to get the deposit into production in order to benefit from the booming building materials market. In September 1924 the company indicated a change to its initial plans when it requested Richmond Council's permission to extend the ropeway over three public roads. Public announcement of the change came at the first shareholders' meeting on the fifteenth of October when it was revealed that the plant would now be

On 25 October 1925, when Bill Anderson took this photograph, the Yarramundi Falls Bridge was just six months old and the company's ropeway, which can be seen in the distance, even younger. The effect on the Island of the June floods is still very evident. Photo: D. Mahon

located at exchange sidings on the Kurrajong Branch and the aerial ropeway would be extended to this site.[4]

There was other important news for the shareholders too. Dorman Long & Co Ltd, concerned over supply of quality material for their Sydney Harbour Bridge contract, had taken up a shareholding. Their resident director, Mr Laurence Ennis was to join the company's board. It was also the appropriate time to publicly reveal the name of the 'exceptionally qualified expert' whom the prospectus had said would manage the company. Mr Stewart announced that Mr JT McKern, previously manager of the state's largest quarry owner, the State Metal Quarries, would join the company.

However the news was not all encouraging. At Richmond a further drain on the company's capital had arisen. Originally it had been intended to purchase electricity from the Hawkesbury Agricultural College to power the company's plant. Richmond Council, which already purchased electricity from the College for resale to local residents, considered it should be providing the supply. Civic hearts were further outraged when the College even offered the company electricity at a lower rate because of its high constant load. The end result was that the College could not get permission to erect transmission lines and Nepean Sand & Gravel was forced into erecting its own powerhouse.[5]

Behind the public arguments however, the company was making progress. In October 1924 the material for the ropeway began arriving on site. Later that month plans went before Richmond Council for the crushing and screening plant to be erected on 'Mr Nowlands' farm',[6] a site soon to become universally known as 'the Depot'.

Three other projects of importance to the company were also moving ahead. November saw the first pile in the Yarramundi Falls bridge driven. Though built only with the needs of the settlers on the western bank of the Nepean in mind, the bridge was to provide a valuable road link for the company. At the same time the NSWGR construction railhead had advanced from Richmond and reached the Lowlands near the Depot making the all important government rail connection a reality. The final project was also to be of long-term importance. Preliminary work was beginning on the Sydney Harbour Bridge and in February of 1925, Dr Bradfield was on hand to inspect the sand deposits. Sand was an immediate requirement for the Bridge and in March 1925 after the final trials of the

ropeway,[7] the way was clear for the first sales. These were made in the first week of April,[8] the sand being carried by rail over the yet uncompleted Kurrajong Railway. It was not until two months later, on 2 June 1925 that the Depot plant was complete and crushing began.[9]

Early Operations

The operation in these early days was simple. Several acres of good clean sand immediately adjacent to the ropeway terminus provided the first site for production. Euphemistically known as the 'sand pit' over fifty men worked here on a day labour basis under the ever watchful eyes of the quarry foreman, Doug Scott, who had come with Bert Fox, the quarry manager, from the mines at Cobar. Overburden, such as there was, was removed by horse drawn scoops and the material beneath, then shovelled through small portable screens into 2 feet gauge steel skips. Horse drawn to a central point, the skips were then, once the pit got deep enough, winched up an incline out of the pit. Their contents were tipped into a small elevated holding bin which fed onto the aerial ropeway buckets.

After being carried the three miles to the Depot, the sand was binned and the gravel fed through a trommel screen and graded. Four inch plus gravel was crushed by a twenty by ten inch Hadfield double toggle jaw crusher. The resulting metal was rescreened and, depending on the orders on hand, binned or fed through a disc crusher with the gravel in the ¾ inch to 4 inch range before final screening and binning. Three quarter inch minus gravel was binned after screening.

The remaining plant at the Depot consisted of the previously mentioned powerhouse where a Babcock & Wilcox water tube boiler and an Allen steam engine drove the electricity generator. Sundry other buildings completed the Depot: accommodation for Percy Thorley (the boiler attendant) and Bill Mahon (the bridge carpenter) lined the southern fence while offices, storerooms and a workshop clustered around the bins.[10]

The NSWGR sidings at this time consisted of loop exchange sidings parallel to the Kurrajong Railway and the two dead-end sidings 1021 feet long which curved almost 90° until parallel to Kurrajong Road. These ran either side of the crushing plant, the working of NSWGR trucks over these sidings being done by a capstan located alongside a 37-ton capacity weighbridge.

STILL GREATER OUTPUT 1926-1929

Though profits in the industry were to decline in the latter years of the 1920s, the period up till 1930 were still boom years for most producers. Increasing production every year to meet higher demand held prices up while the greater output allowed the larger quarries to introduce labour saving machinery and so lower or hold constant their cost of production. For Nepean Sand & Gravel these were years of constant additions to plant. Mr JT McKern was to say later, 'we have added and added'. It was a continuous process, as a piece of plant was replaced to provide an increased production, constraints appeared elsewhere requiring further upgrading of other plant.

The initial moves to increase production were made on the 'Island' as the quarry site now had come to be called. Early in 1926 two *Barber Greene* loaders were purchased.[11] These mechanical loaders consisted of a bucket conveyor with a discharge chute, mounted on crawler tracks. Two opposed horizontal spiral arms at ground level fed the material onto the conveyor. The machine was powered by a *Buda* engine. Each *Barber Greene* had an operator (Darc Upton and Hector Mitchell are remembered) and a support crew of three. A skip spotter/loader and two men trying to keep an even flow of material from the bank feeding onto the spirals. This was a job that required close attention and judgement as when the spirals overloaded the shear bolt on the drive would fly off in a random direction and production would halt.

The *Barber Greenes* introduction dramatically cut the workforce in the sandpit while at the same time boosting production. The result was that the existing holding bin at the ropeway loading point where Bob Ridge emptied the skips from the sandpit, quickly became inadequate for the material stockpiled. To increase holding capacity, construction began prior to October 1926 on a new set of bins adjacent to the old loading point.[12] These new bins were fed from a ground level boot (receiving hopper) and the material carried by a conveyor belt to trommel screens set over the bins. The power for this plant was provided from a powerhouse sited on the eastern bank of the river on land purchased from the Timmins family. Two *Robson* semi-diesel engines powered the generator here.

These changes in plant and output were to provide the impetus for the development of the quarry's railway system from its very simple beginning as a two foot gauge horse drawn system feeding the ropeway.

The 3ft 6in Gauge Railway

Output by this time had exceeded the 80,000 tons per annum originally planned and must have been severely overtaxing the skip railway especially as production areas started to move away from the ropeway loading point. An early indication of Nepean Sand & Gravel's intention to upgrade the 2 foot gauge railway came in June 1926 when the Colo Council was asked to give permission for the company's railway to cross the Yarramundi Falls bridge to exploit the sand deposits downstream on the eastern bank. The projected railway was to occupy six feet of the bridge. Nothing came of the proposal due to vociferous opposition from the settlers at Yarramundi Falls.[13] However the space requested indicates the railway would have been something more than 2ft gauge.

The 3ft 6in gauge railway when it was finally laid, towards the end of 1926, was built to suit the new loading bins and the company's latest acquisitions, two steam draglines. The first, a *Marion* type 37, arrived early in 1927. It was a sixty-ton machine with a one and a half cubic yard bucket and a sixty foot boom. Several months later it was followed into service by a slightly smaller *Ruston R10.*[14] Draglines were new to the industry here and of this size still uncommon, so Nepean Sand & Gravel had to go far afield to eventually find two brothers, Cecil and Ned Dews, to drive them. As soon as they were operational the draglines replaced the *Barber Greenes* and allowed the working of the extensive beds of gravel below water level. A railway was therefore not needed in the sandpit, but was laid around it in a circle to allow the dragline to work from the pit edge. With the arrival of the second dragline the railway was extended to the southern end of the island to allow the digging of the stone beds there. All these tracks were to a degree temporary, the track being moved to wherever the draglines were digging. The draglines loaded portable steel bins set over the temporary track. Under these bins the two yard capacity steel trucks were run for loading. These trucks were of the same design as those used later at the Woy Woy quarry of Basalt Quarries Ltd and probably came from the same source, the disposed plant of the Moonta & Wallaroo copper mines in South Australia.

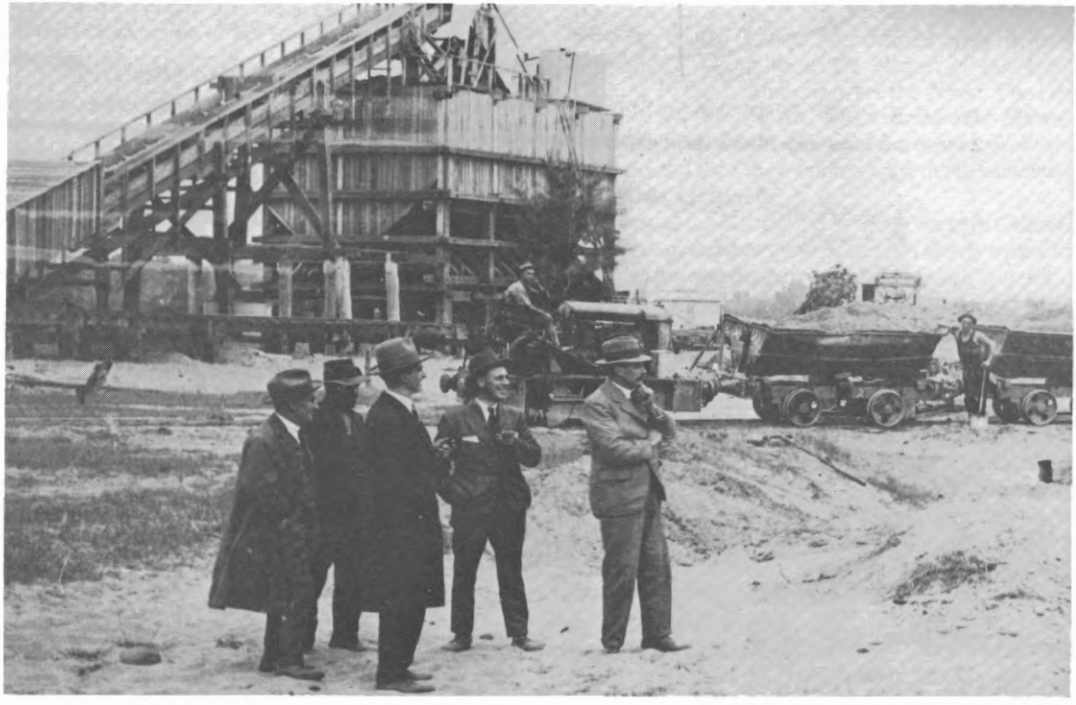
This aerial photograph was probably taken in July 1927 and shows the Depot in its original layout. Within three months the standard gauge railway would be completed.

Photo: R. Clemson

To haul the trucks an initial purchase of three and possibly more rail tractors was made. Chain driven, 0-4-0 units powered by a standard *Fordson* tractor engine of twenty horsepower they had all the features of products of Days Engineering and may have come from that source. They could haul six wagons over relatively flat track but where adverse grades were encountered a load of three or four skips was the maximum.[15]

The Standard Gauge Link

The improvements progressively affected the ropeway. Very early on the ropeway was run at its full capacity. Then meal breaks were staggered so that the ropeway was manned and running continuously. Overtime then became the rule. Finally in 1927, the introduction of the draglines saw two shifts working on the ropeway, as a single production shift with overtime stockpiled enough material for a second crew to work into the night clearing the island bins. The decision to replace the ropeway came quickly, as the situation became untenable. June 1927 saw the two councils concerned, Colo and Richmond, approached for permission to cross their respective roads and bridge the Nepean River. Negotiations were also started with the landholders along the projected route of the railway to obtain leases. Two months later, with all approvals secured and leases signed, construction began and a further two months on, in the last week in October the standard gauge railway commenced operations



On the Island to watch the commissioning of the Marian dragline were Messrs JT McKern (right), HR Fox (2nd right) and D Scott (4th right). Behind the *Fordson* locomotive are the second Island bins, the original site being behind the first truck. Photo: BMI Limited

between the Depot and the Island.[16]

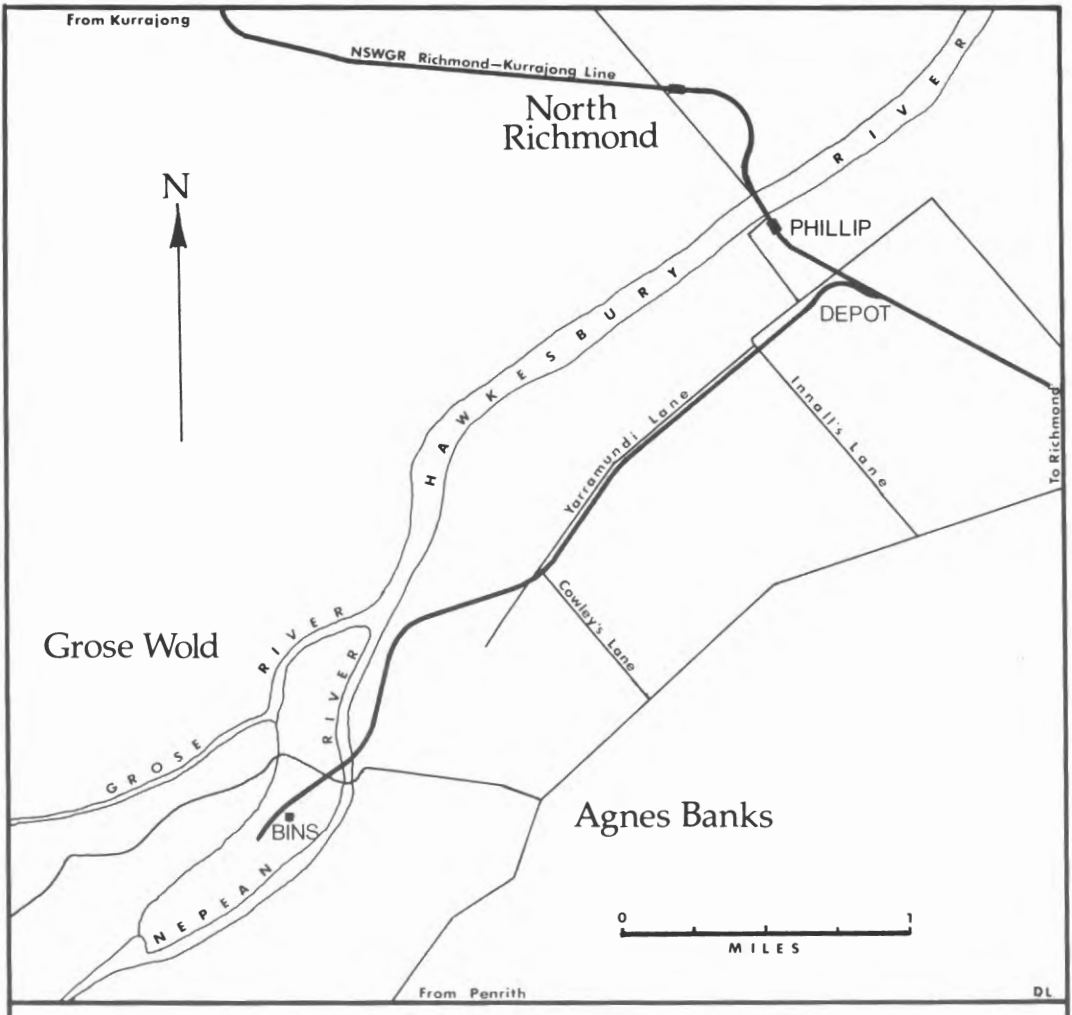
The extension of the railway from the Depot resulted in changes there.[17] A bucket conveyor now fed the plant and was itself loaded from a boot set between the two existing dead end sidings. These sidings had been extended to Innals Lane and two crossoves installed. The eastern, or the 'empty line' as it became called, was extended to cross the road and became the main line down to the Island. The western or the 'full line', terminated in a short siding used mainly for the unloading of trucks of Aberdare coal for the draglines. Two additional dead-end sidings were laid between the two original tracks, to run either side of the new boot. Off the full line was the unloading siding where trucks were unloaded into the boot while off the empty line was a siding provided with a pit intended for locomotive servicing.

From the Depot the railway followed Yarramundi Lane until its junction with Crowleys Lane where it crossed the roads and ran in a south westerly direction through Warnock's orchard to the river bank. Until this point no engineering works had been required, but here, across a natural depression in the orchard, a low trestle was built to avoid any earthworks. The railway then ran along beside the river bank for a short distance before it cut through the bank and curved sharply down to river level where a three hundred yard timber trestle bridge carried the line across to the island. The railway's terminus was at the existing bins, approximately thirty feet higher than the river level, where it is believed, initially, a loop siding under the bins with a dead-end siding was provided.

Locomotives and Rollingstock

Two work the railway two locomotives were purchased from the NSWGR.[18] They were both ex-suburban passenger tank locomotives, an *F* class, 2-4-0T number 1032 (Beyer Peacock B/N 2658 of 1885) and an *M*-class, 4-4-2T number 1104 (Beyer Peacock B/N 3327 or 1891). Both locomotives arrived at the Depot, according to all employees interviewed, just prior to the completion of the extension to the island, indicating that the 'official' sale date given by the NSWGR for 1104 of 4/11/1926 is only a book entry.

Surprisingly only one new employee was hired as a result of the railways introduction. Vere Masters, an ex-NSWGR driver who had worked out of



NEPEAN SAND & GRAVEL CO. LTD RAILWAY – 1937

Richmond, was employed to drive the *M*-class. The other driver, firemen, fettlers, shunters and truckmen were transferred from other work and learned their skills on the job.

The final component of the railway was the trucks. To carry the gravel to the crushers at the Depot, about sixty wooden side-tipping trucks were built in the company's workshop under the supervision of Bill Mahon and Jack Middlemass, the carpenters.[19] Similar to those in service with the NSW Public Works Dept at the time, they were extremely robust. Each was built up from a 10in square hardwood frame with a single doored body mounted on three pivots, a simple mechanism that often presented problems to the Depot unloaders, Eric Mahon and Ern Rowsell. When the door clips and side chains were released and if the load was not concentrated on the door side, the six-ton payload did not tip. The solution was a piece of six by four hardwood and brute strength. As Bill Tierney said, the result was achieved 'any way you could'.

Initial Operations

Big Emma, as 1104 became known, was the main traffic locomotive. Though able to haul more, twelve of the side-tipping trucks made a load due to

Big Emma's propensity for derailing. This was due to the combination of her long rigid wheelbase and the five chain curves, especially up the bank of the river and through Warnock's orchard. Train speed was cut back here so limiting the load up the grade. While *Big Emma* had size, the *F*-class kept herself on the rails and soon earned the affectionate nickname of *Little Mary.* Less powerful, she could only haul eight trucks up the bank and therefore shunted at the Depot. When required however, *Little Mary* ventured down to the island but, unable to haul a full rake, only hauled short trains of sand in government wagons.

It was a busy railway. To clear the stone from the island, which in 1928 would have averaged 600 tons per day, required *Big Emma* to run nine trips prior to the plant's shutdown. In addition there was the sand traffic carried in NSWGR wagons. If pressed both locomotives would work at this, if necessary for several hours after production had ceased to fill all the orders on hand. At this time sand production was at its highest, nearly equal to that of stone, so that on an average day there would have been some twenty return trips. [20]

With two locomotives in steam a system of safeworking soon evolved. The locomotive drivers soon fell into a set pattern of working together around the Depot designed to turn around the locomotive on the run to the Island as quickly as possible. However when both locomotives were working to the Island precautions were deemed necessary. These took the shape of the trains running to the Island one after the other. Then the crew of the sand train, which invariably finished shunting first, would wait until the other locomotive finished and then they worked back in the same way.

Further Growth

Throughout this period Nepean Sand & Gravel's output continued to grow. Councils slowly upgraded their requirements from tenders for the 'supply of sand', to 'Nepean sand'. Some even eventually specifying washed material. This cut competition while giving a price premium for quality. And always in the background were the major public works which required large amounts of material. On these the company could quote low rates and ensure a base level of production. Projects such as the Sydney Harbour Bridge, the City Railway, Bunnerong Power Station, dams like Woronora and Cataract and as well the major road building contracts undertaken by or on behalf of the Main Roads Board assured all the major producers of a steady flow of orders.

This growth pushed Nepean Sand & Gravel during 1928 and 1929 to what was to be its final plant expansion before the Depression. On the island a No 6 *Ruston* steam navvy was purchased for use on stockpiles and overburden removal. As well, probably Sydney's first sand washing plant

Arthur Stell, from his visit probably in 1936, left a number of photographs of railway operations, some of which have been published. Here *Emma* works empty NSWGR wagons across the Nepean to the Island. Photo: F. Stell

Rail historian Mal Park was the first, around 1931, to photograph the railway operations. Among his photographs to survive, the most notable is this of *Little Mary* bringing S-trucks from the exchange sidings.
Photo: J. Kramer collection

was installed[21] to meet the increasing demand for quality product and further motive power was bought for the narrow gauge railway.

Additional Locomotives

Purchased for the 3ft 6in operations was another 0-4-0 tractor identical to those already in service and a small 4-wheel *Planet* locomotive. The little that is known of this latter locomotive comes from Phillip Timmins who serviced and drove it for a time. It was a war disposals *Simplex* with a *Dorman Stafford* engine of forty horsepower which had been sold carrying *Planet* plates. It was to be much less successful than the *Fordsons.* Phillip Timmins' memory of its was;

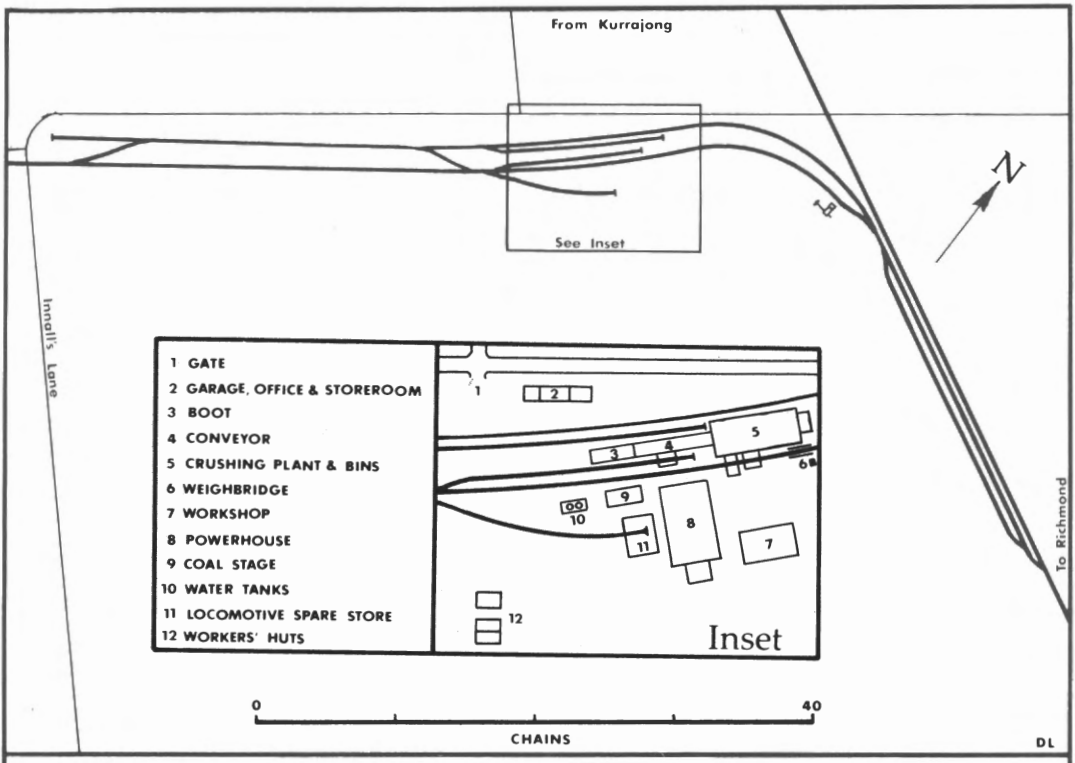
> "She'd jump off the line anywhere at all. Poor old Herc Riley, he'd have to come with his spikes and German jack and get it back on again. But I used to feel embarrassed when it came off the line. I felt it was my fault. But it wasn't Herc Riley's fault. It wasn't anybody's fault at all. It was just a bad locomotive".
>
> It was an experience remembered by all who worked with it.

The standard gauge railway also required an additional locomotive. The choice was a *D*-class 4-4-0 express passenger locomotive from the NSWGR number 1630 (Dubs B/N 2137 of 1885). So the company became noteworthy as the only NSW private railway to roster an ex-government express passenger locomotive. The locomotive was delivered without its six-wheel tender which was required for a 30-class conversion. In replacement, Glebe Engineering Works built a small four-wheeled tender.[22] With 1630s arrival, Vere Masters transferred across and the *M*-class became just plain *Emma* and was relegated to reserve.

Depot Upgrading

The final upgrading of plant came at the Depot.[23] Earlier additions had seen the powerhouse steam plant augmented with a *Campbell* oil engine and the installation of another secondary crusher, a four foot *Symons* Cone Crusher — probably the first in Sydney. In early 1929 a second *Symons* cone crusher, (a three foot) was installed replacing the disc crusher. Two *Lahey* vibrating screens (eight foot by four foot with two decks) replaced the trommel for the final screening giving a superior graded product and a higher production rate. Finally and most visibly the bucket conveyor was replaced by a belt conveyor fed from a new boot.

The year closed with the company having its plant fully modernised, a factor that provided a competitive edge in the following years. But for that advantage over £110,000 had been invested in plant leaving the company short of funds. This was to constrain management in the years ahead and even threaten the company's existence.



THE DEPOT – c. 1938

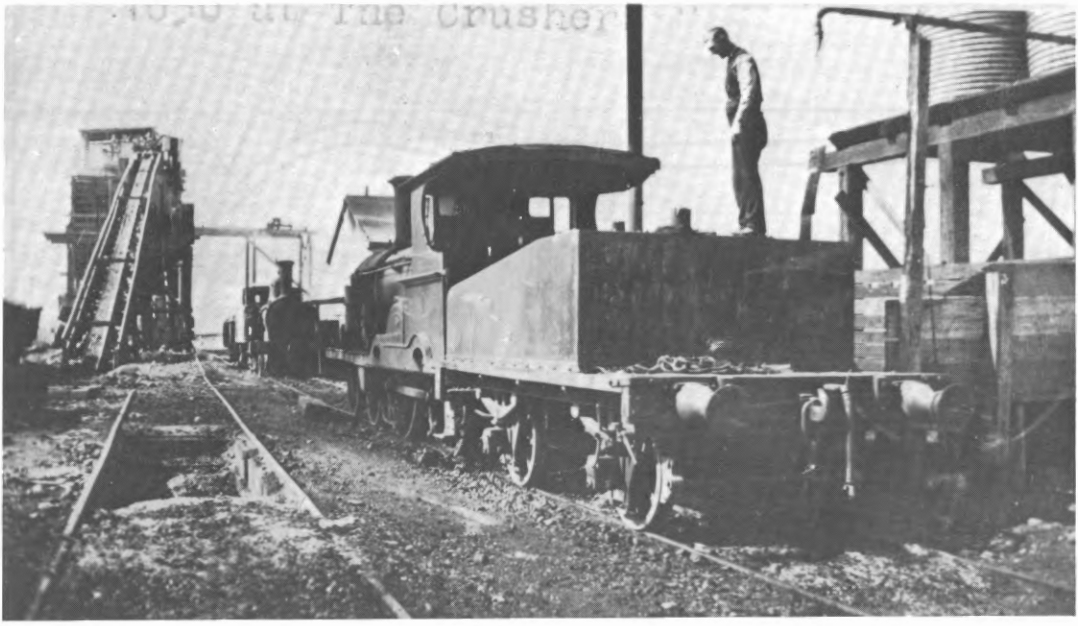
TO WIN THROUGH 1930-1935

In retrospect, 1929 for the Sydney quarry industry marked the beginning of the Depression. Shareholders in Blue Metal Quarries Ltd (Dunmore Quarry) and Menangle Sand Co Ltd were among the lucky ones being bought out before the full effect became evident. Others were not. While the big producers cut prices to get orders, many of the small or distant owners like Western Blue Metals Ltd (Sodwalls & Mt Lambie) and Basalt Quarries Ltd (Woy Woy) closed.

The Search for Markets

Surprisingly, in 1930, while all other major producers reported losses or negligible profits, Nepean Sand & Gravel's profits held up. To widen its market customers had been sought for consignments of less than rail truckload. This end of the market had been tapped a decade before by the State Metal Quarries using their own steam and motor lorries to deliver to city customers from their Rose Bay hoppers. Later on NSW Associated Blue Metal Quarries Ltd and Southern Blue Metal Quarries Ltd built railway supplied bins at Alexandria and Rozelle respectively.[24] From these sources a customer could have supplied direct to his construction site the exact quantity required when he wanted it. A service that could not be given through direct supply from the quarry where whole truck loads were the rule and delivery was dependent on the vagaries of the NSWGR. Nepean Sand & Gravel opened its own siding and bins in February 1930 at Rozelle[25] and brought in carriers EM Lotze and A Farrow to do the deliveries. While most of the deliveries were to city customers, trips were made to the inner suburbs and occasionally to customers as far away as Sutherland.

With the winning of some large contracts from the Main Roads Board and the MWS&DB (for Woronora Dam) profit levels held and production was lifted fifty thousand tons to what was to be the quarry's all time peak production of nearly three hundred thousand tons. It could not last. As each large project finished, orders reduced. The remaining producers became more desperate with their pricecutting.



Above: Another Mal Park photograph from 1931 caught Vere Masters atop 1630's tender at the Depot while *Little Mary* shunts NSWGR wagons under the metal bins. Photo: ARHS Archives
Below: Vere Masters leans from the cab of 1630 as it crosses the almost dry Nepean River, c.1936. The road bridge can be seen behind. Photo: F. Stell

Nepean Sand & Gravel which had grown fastest declined likewise. A hundred thousand tons of sales were lost in 1931 and another hundred thousand in 1932 resulting in the company's lowest output ever and its first loss. They were dark days for the company and its employees. The plant often worked only three days a week. Even then orders were so slow that the bins had to be cleared to allow production to continue. Soon the Depot had a sizeable metal dump along the eastern fence. Thursday and Friday's production halted as customers wanted neither to employ men to unload over a weekend nor could afford to pay demmurage. Any orders requiring dispatch on these days were

hand barrowed into trucks on a new siding laid off the empty line and behind the water tanks and coal stage. The piece rate for this was at 3d a ton for anybody with luck enough to be offered the work.

A crisis came when the company's bankers, the Union Bank, requested the overdraft be reduced drastically. Bluff saved the day. Mr JT McKern advised that he would continue to issue cheques up to the previously agreed limit and if the bank chose to dishonour them it would be placing the company in liquidation. In the company's situation the threatened result was realistic and the bank backed off to give the company a breathing space to restore profitability.[26]

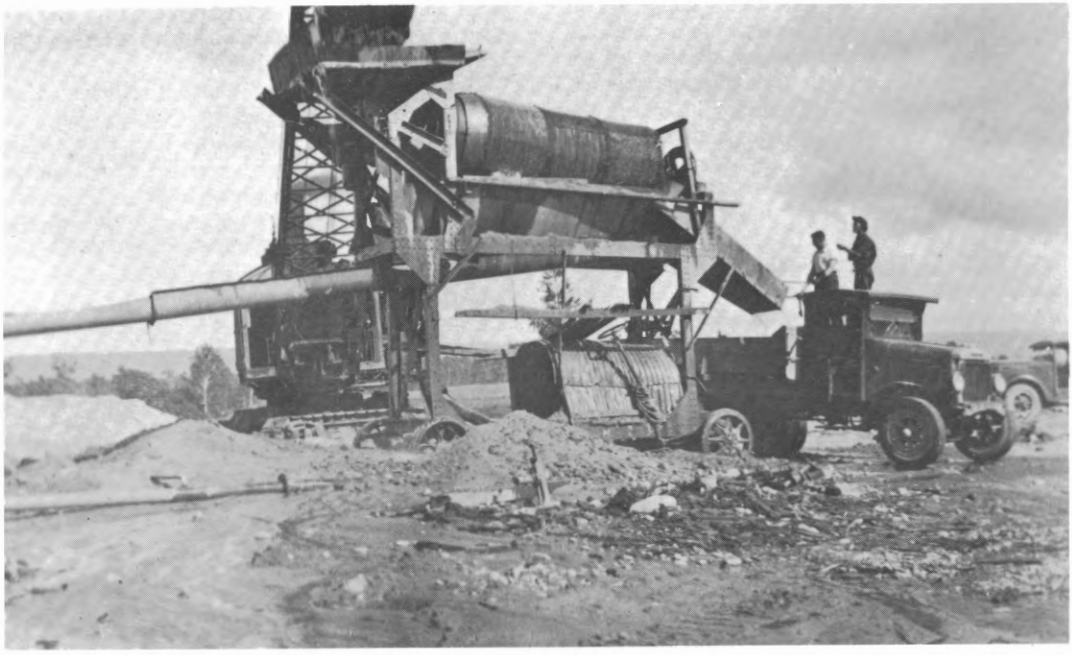
The Camasanees

At the prices then ruling, gravel and metal were marginally profitable but sand returned only around a shilling a ton over the NSWGR freight charges. That shilling was only a proportion of the production cost. Even worse, most of the sand produced in obtaining the gravel could not be sold and had to be pumped back into the river. If sand could not be produced for a profit the answer was not to produce it at all. The revamped island operation would centre around two new portable railmounted screens called *Camasanees*. These were loaded directly by the draglines and would screen out the gravel for loading straight into rail trucks. By laying standard gauge track down to the draglines, gravel was taken directly to the crushers at the Depot. The Island plant and bins, its crossriver powerhouse and the narrow gauge railway were no longer neeed and the railway closed early in 1932.[27]

The Camasanees were unusual rollingstock to say the least.[28] Designed by Nepean Sand & Gravel, they were built on the Island by Glebe Engineering Works. Each comprised a combination of new and material already on hand at Richmond. A small trommel screen mounted atop a box frame was powered from one of the *Fordson* locomotive from the gravel and then carrying the waste sand back to the river. This structure stood upon two wheel sets with approximately a twenty-foot wheel-base which in theory made them easily movable. In practice they weren't. Standard gauge track would be laid in the direction desired and a locomotive and as many men as possible were assembled. A steel hauser would be attached to the locomotive (or the dragline at a later date) and the men placed under the waste sand and water pipe which ran back to the river. On a signal the men would lift the pipe up and as the locomotive pulled the *Camasanee* the men walked the pipe to its new location. Needless to say moves were not usually over very large distances and were heartily disliked by all involved.

For the operators, Bill Dries and Stan Davis, the *Camasanees* were not the easiest machines to control either. The main task of the operator was to load the side-tipping trucks. As long as there were empty trucks to fill, the draglines continued to work

Emma under repair at the Depot in 1938. Behind the water tanks stands newly painted 2409 while 1630 is behind *Emma*. Photo: JL Buckland



On the Island, circa 1940, one of the *Camasanees*, now converted from rail, loads Cleary Bros lorries. Under the chute is a Model 54 International with Stan Davis and Stan Smart on top, while behind is Len McLeod's International 63. The Marion, loading here, had received a new 70ft. boom and a 1¾ yard bucket. Photo: D. Smart

without regard as to whether or not a truck was below the discharge chute. It was up to the operator to ensure that gravel ended up in trucks and not on the ground. They had to be adept at estimating how many dragline bucketloads would fill the previous truck (which varied with the proportion of stone in the material), and as the last stone dropped from the screen remove the sprags and with a pinch bar run the truck down to the previously loaded trucks. Then, before the next bucketload came through, another truck would be pinched up, spragged under the chute and the process repeated.

A Return to Profitability

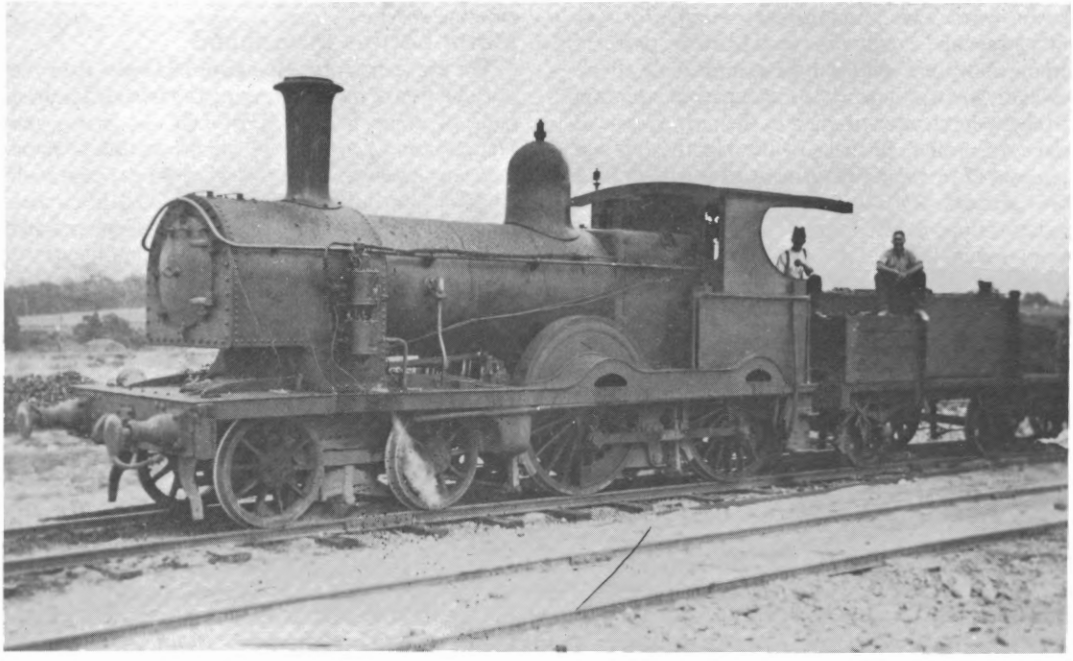
It was to be the saving from the *Camasanees* operators that returned the company to a firm financial footing. Profits were further improved with a lift of over a shilling a ton in selling prices and the restriction of the State Metal Quarries to only supplying government orders. The company also continued to look for cost savings. The major one was the purchasing of electricity. Ironically it was again through their competitor River Sand (Nepean) Ltd that the change was effected. River Sand (Nepean) Ltd must have been the only producer to earn a profit in 1932 but the directors realistically saw only a limited future and sought other avenues of business. One was to supply electricity from their riverbank powerhouse to local consumers. After prolonged discussions with Colo, Richmond and Penrith Councils a limited franchise was obtained. Further delays followed and it was not until May 1934 that River Sand (Nepean) Ltd, now renamed Hawkesbury Development Coy Ltd, began supplying North Richmond with electricity from Sydney City Council's newly commissioned Bunnerong Power House. Transmission lines took somewhat longer to reach the island. Electricity was first supplied on 7 September 1934. Its availability allowed Nepean Sand & Gravel to economically return to sand production with a small sand pump. The Hawkesbury Development Coy Ltd sand plant had latterly been operated by Ken Styles (later of Styles Blue Metal Quarries Ltd, Prospect) on a hire basis after the company had left the industry and he produced his last sand for Nepean Sand & Gravel during the first week of November 1934. From 8 November 1934, Nepean Sand & Gravel recommenced sand production. It was later again (on 25 January, 1935) that Richmond Council began supplying bulk electricity to the company and the Depot power-

house was permanently closed.[29]

Depression Operations

For the railway, the period 1932-1935 saw few changes. Two worth nothing happened late in 1934. While *Emma* had been working frequently the rake had been limited to twelve trucks, her maximum load. Pre-Depression when 1630 was on the Island run, additional government trucks would make up the load and give extra braking power. Later, when output fell and there was no sand to carry back in government trucks, there was no reason to increase the load. However as output picked up the opportunity was taken to increase the load and cut the number of trips. This reduced production overtime which was worked on an irregular basis even during the Depression. August 16, 1934 saw the introduction of the fourteen truck rakes giving each train a payload of between 95 and 100 tons.[30] Also in 1934 another *D*-class was purchased. Spares for 1630 were hard to obtain so 1625 (Dubs B/N 2132 of 1885) was purchased from the NSWGR to provide a source.[31] 1625 had only recently been withdrawn (March 1933), the last of the *D*-class in service. It proved a good choice. Upon inspection, Bert Fox decided it would be wasted in its intended purpose and it was returned to service. Again it was purchased without a tender and another was fabricated. This one incorporating some refinements to the previous successful design.

Daily production at this time required seven or eight rakes of stone from the *Camasanees* and once the sand pump was in production, three or four trains of sand. *Little Mary* still saw service as a shunter. Though once the spectre of her being required on the Island run receeded with the availability of the second *D*-class, *Emma* came into favour as the Depot shunter. There, with less opportunity to derail, her greater power could be put to good use. Of the two *D*-class, 1630 retained her position as the main traffic locomotive on the Island run with 1625 in reserve.



1625 on the Island c.1939. The additional sandpipe can be seen on the cab side. Photo: BMI Limited

AN OPERATING COMPANY 1936-1939

The end of 1935 marked a turning point for the quarry industry. In January of 1934 tenders had been called for the remaining state enterprises. This was the climax of a long campaign by the private quarry owners over what they saw as unfair and necessary government competition. With assets larger than any of the existing operators together with low sales (1934 sales of under £70,000) the State Metal Quarries had presented a dilemma to the rest of the industry. Once the government was persuaded to put the State Metal Quarries on the market, if the quarries were not sold the government would come under further pressure to sell metal to councils while if sold a private purchaser would need to boost production to make the investment pay and would set off another round of price cutting. Soon after the tender was announced the decision was made:[32] major quarry operators would join together in a collective gamble and tender for the whole undertaking. The seven partners final bid of £170,623/19- was accepted early in 1936 and Quarries Ltd took over the State metal Quarries on behalf of the partners.[33] Its product and a quota of metal and gravel for the 'operating companies' (partners with working quarries) would be marketed by Blue Metal & Gravel Pty Ltd a company again jointly owned. This structure was to survive for over thirty years and eventually result in all the partners coming under one ownership. The immediate effect, however, was to concentrate management attention on the modernisation of plant as the only avenue to increased profits. Because of the Depression and the costs of financing Quarries Ltd it was to be a slow process for all the partners. Indeed the modernisation at Richmond was to be the first completed in 1940.

The first of the changes came in 1937 with moves to increase the company's capacity to undertake its own maintenance. A corrugated iron shed was erected at the Depot over the end of the siding laid during the Depression for the barrow loading of trucks from the stockpile. The shed was used to store spare parts, tooling and patterns for the locomotives but strangely no part of the siding was ever to be used for locomotive repair.[34] The worksite remained at the pit opposite the water tanks.

An Additional Locomotive

At the same time the maintenance workforce was increased. Stan Kincaid returned as works foreman and several additional men were hired. One of these was Les Bickford, a NSWGR trained locomotive fitter. His first job was to evaluate the condition of another new arrival ex NSWGR *B*-class locomotive number 2409 (Dubs B/N 2632 of 1891) which he remembers was mechanically 100 per cent. Despite this 2409, a small wheeled 2-6-0 goods type, was to sit on a siding for several years just receiving a six monthly coat of paint.

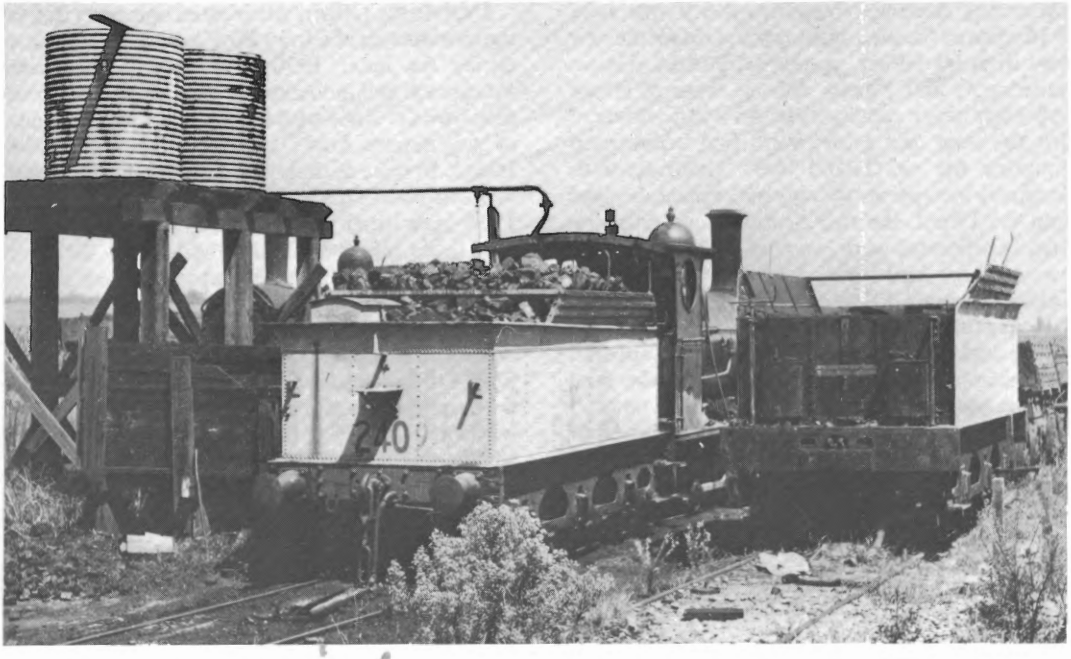
Several reasons have been advanced for this. With its outside cylinders the banks in the cutting through the river bank as well as the timbers on the Island bins had to be cut back to get the necessary clearance. But these were minor obstacles and its non use reflected a preference for continuing with the *D*-class. With production stable, at approximately half the pre-Depression peak, larger trains were not required and there were insufficient side-tipping trucks. Moreover, minimal maintenance had been done on the track and it was now very rough and rundown. The *D*-class, with a similar axleloading to the *B*-class, was considered to be easier on the track with its leading bogie and shorter rigid wheelbase. There were also maintenance savings in running two *D*-class. Finally there was the often expressed pride in running a passenger locomotive which had worked on the Melbourne Express. The *B*-class figured in long term plans but in the short term there was no question of 2409 entering service.

Motor Lorries Introduced

The big operational change of 1937 was to be the introduction of motor lorries on the Island. The best beds of stone had been worked out during the Depression. Consequently the proportion of stone won was consistently lower than 40 per cent with worksites having to be frequently moved. Even with the limited requirements of the trade, Nepean Sand & Gravel was often hard pressed to supply orders. Motor lorries allowed much more flexibility though they were more expensive, adding approximately a shilling a ton to the cost of production. Cleary Bros were contracted and brought up from the South Coast a number of their solid tyred model 54 and 63 *International* lorries together with foreman Roy Smart and his brother Stan. Commencing on 30 August 1937, the motor lorries were loaded from the *camasanees* and ran to a loading bank on the railway adjacent to the Island bins where they tipped directly into the rail trucks.[35] The *Camasanees,* now without the standard gauge track to run on, were altered to run on rubber tyred wheels.

Plant Modernization

The introduction of the lorries foreshadowed further plant modernization. John McKern, then an



2409 in 1940 soon after entering service. Alongside is another B-class tender, last used behind 1957, which had been purchased in 1937 with 2409, but was never used. 1630 is behind 2409.
Photo: JL Buckland collection

The 1939 Island plant under construction. The photographer, Roy Smart, is standing on what will become the line under the gravel bins. To his left is a new line to go under the sand bins. For metal loadings the original track under the 1926 bins on the right will be used. Photo: BMI Limited

engineering student, remembers that it was June 1938 when he finished drafting the plans for the new plant from his fathers' working drawings. Almost immediately Bill Mahon and his team of bridge carpenters began construction. An additional set of bins for sand and gravel were first constructed alongside the old Island bins. These were to eventually incorporate the only major plant salvaged from the Depot, the two *Symons* cone crushers. Also incorporated were two *Hadfield* 24in by 14in jaw crushers and new *Jacques* Cascade and Cataract screens.[36] The existing 1926 bins would hold the crushed metal and to these bins were added a three deck *Allis Chalmers* screen. It was not until 15 December 1939 that the first stage, the sand washing and gravel screening, came into operation.[37] The final crushing at the Depot was to be some four months later on 21 March 1940[38] after which time the operation was concentrated on the Island and the Depot plant closed down.

Despite the railway's truncated operation due to the introduction of Cleary Bros' lorries, its operation during the latter 1930s did not change much. Production still amounted to an average of eight or nine trains of stone with another three or four trains of government trucks shipped directly from the Island. In spite of their age, 1630 and *Emma* still handled most of the traffic. 1625 had for a period in 1938 been fitted with sandpipes fed from the cab (she faced tender first with the load up the river bank) and had been used down to the Island. But by May 1939, 1625 had been placed out of service.

In 1937 *Little Mary* had been sold and later dismantled at the Depot. As Australian Iron & Steel Ltd has been mentioned[39] as the purchaser of is possible some of the parts may have found their way into AIS No 2 (Henry Vale B/N 41/1887) which was undergoing repair at their Cringila workshops at this time.

A CONTROLLED INDUSTRY 1940-1945

The closure of the Depot in March 1940 heralded changes for the railway. Till then nearly all production had been carried by rail, mostly to the Depot for processing. This essentially internal role now ceased and the railway in its new external role came under an increasing challenge from road transport. All the product now carried on the railway went in NSWGR trucks and the company's own side-tipping trucks were stored at the Depot. The cutting down through Warnock's orchard was widened and 2409 entered service early in 1940 handling the Island run.[40] 1630 still saw occasional service when a second locomotive was required due to production peaks, but was usually only used to shunt the trucks over the weighbridge at the Depot prior to their despatch. *Emma* had been retired early in the year, her boiler beyond repair.

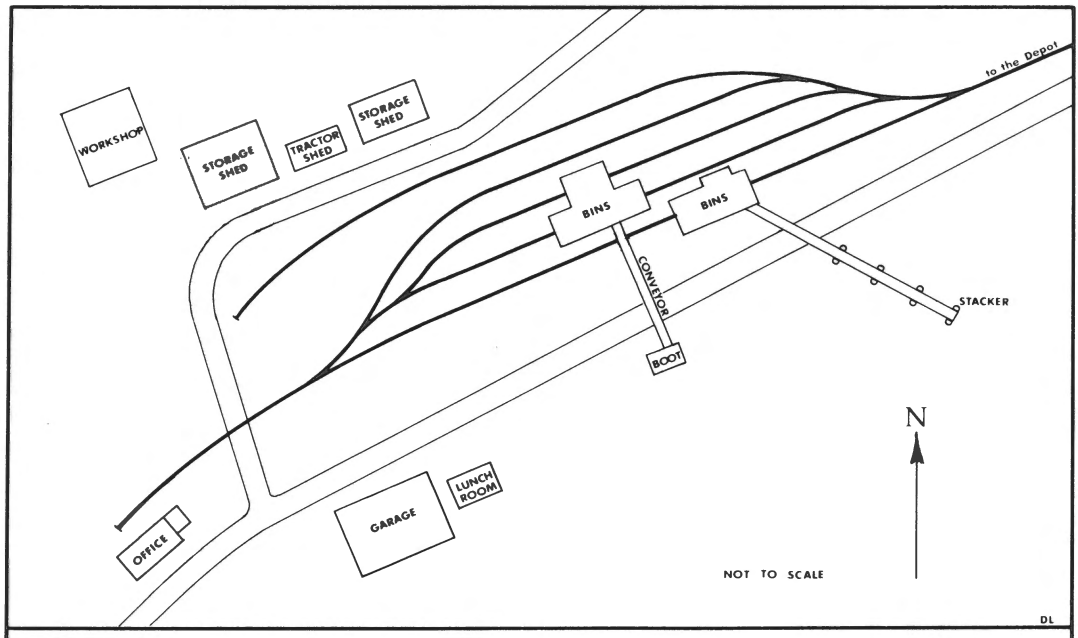
The European hostilities were having an immediate effect on sales. Production for June 1940 was a mere eight thousand tons of metal and gravel and an unknown amount of sand, barely enough for four trains a day, even less when the remaining local customers, mostly councils and defence projects, were considered. Motor lorries could best deliver the loads of gravel and grit required to extend the runways and build parking bays at the RAAF base on the eastern side of Richmond, Nepean Sand & Gravel's biggest defence job at that time.[41]

Australia's largest defence project was commenced in 1940 and providentially for the company it was to be sited in Sydney. The Garden Island graving dock would require many tens of thousands of tons of material. This was to be some years away however and 1940 also saw the beginning of limits on private construction.[42] If sales were harder for Blue Metal & Gravel PL to make, Nepean Sand & Gravel also had its own problems with production at Richmond. While many of the spare parts required could be made on the Island workshop some could not. Crushers and screens were kept going as best they could and Cleary Bros' lorries were often out of service.

With the fall of Singapore in February 1942 Australia's position was very serious and the graving dock became a top defence priority. Soon after Blue Metal & Gravel won a contract to supply much of the material. 1678 tons daily was the new agreed production level,[43] more than doubling the output of metal and gravel of all the partner's quarries. Nepean Sand & Gravel's quota was boosted to 560 tons a day (not including the company's own sand sales) and the company became a protected industry under manpower control. It was during the first year of the Dock Supply Contract that the arrangement with Cleary Bros broke down. As a result Nepean Sand & Gravel purchased the first of its own lorries, three *White* WA18's.[44]

Wartime Railway Operation

The Dock Supply Contract certainly meant better days for the railway. Now almost all the output was railed to NSW Associated Blue Metal's hoppers at Alexandria from where it went to



THE ISLAND – c.1945

various stockpiles in the inner city. Due to the disorganisation caused by the war, trains ran when trucks arrived at the exchange siding. Even though the supply of rail trucks for the Dock had top defence priority they could still not always be obtained. Even when they were, their arrival was often unscheduled and trains from the exchange sidings ran with whatever NSWGR trucks were at hand.

With little need for two locomotives in service it was possible to take 1630 out of service for a major overhaul. But before this she was steamed for what was the last run of a *D*-class over NSWGR rails. Her many years of running down to the Island had resulted in uneven tyre wear and permission was given to use the Richmond turntable.[45] The opportunity presenting itself, 1625 was hauled up and turned also. Afterwards the locomotives were returned to the Island where 1625 was stripped to provide parts for 1630. Because of material shortages and the amount of work to be done it turned out to be a long slow job.

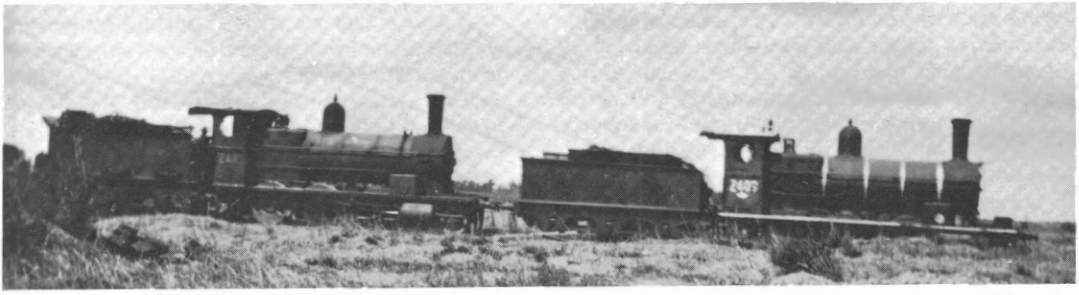
With the prospect of having only 2409 in service for quite some time application was made to the NSWGR to purchase another locomotive. *B*-class 2411 (Dubs B/N 2634 or 1891) arrived light engine one afternoon in September 1945.[46] Its fire was dropped and it was left standing on the exchange siding. Not required immediately for service, 2411 was hauled to the coal stage to await a resurgence in traffic. By this time the overhaul of 1630 was almost complete. John McKern, who at the end of the war set up Howard Engineering Ltd, remembers that in 1946 he handled the last major outstanding item of overhaul, the machining of the steam chests *in situ.*

Closure

Although the railway was still operating at this time the company's situation had not improved with the ending of the war. Defence work halted and because of shortages of all building materials, private construction was slow to restart. Railway trucks, if anything, were harder to obtain and their supply was uncertain and intermittent.

The inevitable happened in July 1946. Stewart McKern, who was working on the *White* lorries, now numbering seven, at the time recalls:

> 'They finished up bringing down eight trucks one morning. That's all the railways supplied. Alan (McKern, then quarry manager) said, 'take them back to the siding'. And then he rang up big carriers in Gardiners Road, Botany. They had a lot of subcontractors and that day there was twenty odd trucks came in within an hour and that was the last of the railway.'



2409 with newly arrived 2411 at the Depot in October 1945. Photo: K.Winney

REMOVAL

Like many railway closures, it was not intended to be permanent. In December 1946, a company reply to council complaints over the damage being inflicted to the Yarramundi Falls Bridge, envisaged only a further twelve months of lorry traffic.[47] Not that the company was happy with road transport: at over 3d a ton mile[48] contract delivery was twice the cost of rail transport. But for the customer it had the important benefit of delivery right to their worksite. Only a few customers, like Kuring-gai Council, had rail served bins. Most had always unloaded rail trucks by shovelling into drays and lorries and were eager to get away from the increasingly expensive use of labour. Nepean Sand & Gravel's 1947 Annual Report put it succinctly; road transport was 'highly efficient though more costly.'[49] By this time the company had opened a quarry at Castlereagh and lorries were also delivering direct from there. So when the truck shortages passed there was little question of returning to rail to deliver to customers.

Nepean Sand & Gravel's independent existence was coming to an end also. Late in 1948 NSW Associated Blue Metal Quarries Ltd made a successful takeover offer, though for quite some time this had little visible effect. The railway just stood still.

The railway became a stopping place for rail enthusiasts with the only *D* and one of the two remaining *M*-class locomotives located there. In 1951 it attracted one of the first ARHS tours. Finding 1630 operational prompted a request that it be steamed. The return visit was in September 1951 when Les Bickford recalled replacing the missing cab fittings and had 1630 steaming up and down the last two hundred yards of the workshop siding on the Island.

The following year saw the scrapping of *Emma* and 1625 leaving the three operational locomotives. The retention of the railway equipment reflected interest at board level in returning to rail transportation for bulk loadings and the fear that they may be forced to return wholly to rail transportation through legislation as had been done by the Lang Government through the State Transport (Co-ordination) Act 1931.[50]

The closure of the Kurrajong line in 1952 put paid to hopes of the railway reopening. With no hope of further use, the two *B*-class locomotives were sold to Bloomfield Colliery at Thornton in 1954. 2409 became the last locomotive to move over the railway when the company's tractor hauled it up to the Depot. From there both of the *B*-class locomotives were taken to Richmond where the missing parts were replaced and a fresh coat of paint applied before despatch to their new owner.[51]

This left only 1630 on the Island. Moves were made by Bruce MacDonald to see her preserved but no group was willing to care for it. Finally early in 1956 a flood undermined the track on which it stood and the locomotive overturned. Not worth recovering, 1630 was sold to Joe Taylor, a Penrith scrap metal merchant. He cut it up where it lay.

It was not until 1959 that negotiations with the NSWGR saw results with the opening of loading facilities in Richmond yard and the building of bins at Wolli Creek. These bins would take loadings from Richmond, Dunmore and Emu Plains quarries.

In the years following, most of the plant from the period of the railway's operation slowly disappeared. At the Depot the bins were the last buildings to go being pulled down in August 1948. However some of the track and the side-tipping wagons remained until the early sixties when the block was cleaned up. Until recently the foundations of the crushers and the powerhouse remained. The two steam draglines continued in service until the mid fifties when they were replaced by diesel draglines.

Very much a backwater with the development of quarry sites further upstream, the Island plant

remained unchanged for many years. But, with the resurgence of sand prices in the early sixties, a large sand classifying plant was built incorporating the existing plant. Soon after its completion the largest flood in the history of the company occurred. The gravel bins constructed in 1939 were the only substantial structure to survive and due to their being partially undermined they were later demolished. So passed the last physical contact with the days of the railway.

For Nepean Sand & Gravel, it together with its holding company NSW Associated Blue Metal Quarries Ltd, were refloated as part of the assets of a new company, Blue Metal Industries Ltd which since 1950 has operated the quarry at Yarramundi Falls. Latterly the company has been taken over by Boral Ltd.

A DIFFERENT TALE

> It's an ill wind that brings nobody any good and the Nepean Sand & Gravel Company has brought some prosperity to the district. It will be alright while the weather is fine but when a flood comes there will be a different tale.
>
> *Windsor & Richmond Gazette,* 10 April 1925

Floods

Floods and their threat were to be everpresent on the Island. Even a cloudburst could cause a rise in the river and disrupt production. Time lost could be substantial too. Over the six year period covered in the surviving company records the time lost varied from none in 1939 (a year of severe drought) to the situation of 1934 when 21 production days were lost in six floods with a similar number of days of production disrupted.

The sceptics of 1925 did not have to wait long to test their predictions. The first flood was small. 'A baby flood', according to the *Gazette,* but it was still high enough to cover the Island. If this was the quarry's baptism, the Nepean was to be at its worst with a June flood reaching 38ft. Not only was the aerial ropeway brought down and it's anchor block undermined but the flood broke through at the NSWGR bridge construction site and flooded the Depot as well.

Though each flood was a potential disaster that June 1925 floods also showed their benefits. As the flood ebbed a further five feet of material covered the Island. Having made its first sales and with the proceeds of a further share issue forthcoming Nepean Sand & Gravel was able to withstand those first floods and from the experience gained develop a plant and procedures that would minimise future damage.

All subsequent bins and major structures on the Island were built upon piles driven twenty feet into the ground. Even the first Island workshop was elevated some fifteen feet off the ground. But, there was a limit to the safeguards that could be designed in and to protect the balance of the plant procedures grew over the years to minimise damage. At night after heavy rain a watch was always kept on the river. Any quick rise would see Bert Fox or later Alan McKern notified. With three or four men they would come down and get steam up on the draglines. The safest place was a concrete block laid for the draglines on the highest point of the Island so they would not be undermined. The river being capricious however, the draglines weren't moved immediately to the block. Instead they were kept just ahead of the rising water, so that, as did often happen, if the water stopped rising, the morning shift would not find the draglines with their tanks dry half a mile from the worksite. Sometimes the river rose too fast and a dragline would be caught before it could be driven out.

Draglines were not the only plant over which precautions were taken. If the Nepean rose in daylight the standard gauge rail trucks were taken across the river and stored either at the Depot or in the cutting at Warnock's orchard. At night, with no locomotive in steam, this was not possible and so, along with the narrow gauge rollingstock, precautions, were taken to stop them being washed downriver. Chains were run through their wheels and tied to the rails. In a later period the lorries would be taken onto the high ground on Jack Clemson's property on the western bank. If the river was still rising the final precautions would begin. The maintenance gantrys over the crushers would be used to hoist the electric motors as high as possible. Then the men would retire to the top of the bins and wait for one of the company's two flood boats to take them off.

Once the river started dropping Les Taylor and Col Campbell would start ferrying men across. Pat Willmott described it thus:

> 'They'd row you up the side of the bank, the two rowers, for a heck of a way up and they'd nose her out keeping her pointed into the floodstream all the time and you might come back down the other side to opposite where you got in'.

Crossing the river had its nervous moments too:

> 'We ended up one morning on the top of a submerged fence post. You used to wear your gum boots. You'd have on a pullover under overalls and probably a big army coat. Most of them had a sugar bag hung around their necks with their meals'.

Not the easiest attire to swim in should the boat capsize among the flood debris. The only fatality at the quarry was Stan Leader, a soldier settler from Kurrajong, who drowned in 1934 while swiming his horse across the Grose on his way to work.

Once on the Island there would be plenty to be done. Pat Willmott's first memory of working for the company was the flood of June 1943 and Bert Fox: "The first thing he gave me was a No 3 shovel to clean up the railway". This flood was to cause the greatest damage to the standard gauge railway. Some two hundred yards of the bridge approaches were washed away. However it was not until the fifties and sixties that the Nepean would sweep all before it and make it a 'different tale'.

Prosperity

But if the *Gazette* journalist was not completely correct over the floods, he did foresee correctly the prosperity the quarry brought. It was through the jobs created. There was always seasonal agricultural work in this closely settled farming district but there was never enough permanent work off the farms. The company with its initial large workforce became the district's largest private employer. Despite the reduction in numbers brought by mechanisation it was to hold this position for many years.

Jobs meant people. Almost automatically one says men, but is reminded of Heather Kirkland who worked in the Island office after the Depot closed in 1940. Many of the men have been mentioned earlier. With the scarcity of work there was little turnover: a core of men who joined in 1924 and 1925 stayed until their retirement. Men like Jack Clemson and Alec Christie who fired the draglines, Luigi Brazzale and Bob Lane on the crushers and Darc Riley the relief Depot driver and truck loader.

Perhaps the longest serving employee was Bill Tierney. After many jobs in the quarry he took over the Depot locomotive. Taking the opposite approach to driving to Vere Masters (who always took a measured run at the bank and never worried about having to set back for a second run). Bill especially on the smaller *Little Mary* would open the throttle fully. Many knew one day they would be picking

Company workers on the Marion with coal baskets, c.1941. Alec Christie and Cardy Silk are in the cab, Bernard 'Bunny' Barnes and Alan McKern on the dray, and Bill Mahon, Boyden Shepherd and 'Bess' on the ground. Photo: D. Smart Collection

Little Mary out of the Nepean but Bill's judgement proved sound and they never got the opportunity.

There was a wider prosperity, too. Between Wars, Sydney had become a city rather than a sprawling number of small communities. Sealed roads had been laid over the dirt tracks and buildings had begun to grow upwards. Richmond Quarry, over the period Sydney's biggest, and the railways that had made it possible, played a part in this development.

Appendix One

NS&C Profit and Production 1925-1948

Year	£	Tons	Year	£	Tons	Year	£	Tons
1925	0	9624	1933	2945	100182	1941	8495	142313
1926	4829	94147	1934	4411	102172	1942	4317	
1927	6267	144876	1935	7760	165861	1943	5208	
1928	9439	182816	1936	8248	171338	1944	3524	
1929	11797	231543	1937	11865	157100	1945	3707	
1930	11274	280142	1938	10478	167066	1946	3509	
1931	422	183841	1930	11798	161678	1947	7200	
1932	(2822)	92537	1940	9409	115750	1948	7648	

Sources

Profit from Annual Accounts published in *Jobsons Investment Digest.* Quarry production; Years 1925-1933, 1940 and 1941. As reported 'Outwards loading- other minerals Richmond' in *NSWGR Annual Reports.* In most years NSWGR loadings would have been less than actual production due to road deliveries from the Depot except for the period from March 1929 when River Sand (Nepean) Ltd, selling through Gibbs, Bright & Co, would have increased loadings. Their production was probably less than 10 000 tons per annum at its peak.

Years 1934-1939 are from the NS&C Account book, adjusted in 1934 and 1935 for sand sales through the River Sand (Nepean) plant.

Acknowledgements

In the five years since I learned of the railways at Yarramundi many people have been generous with their assistance. I would like to thank those listed as being interviewed especially Alan McKern. Also to John Buckland, Stan Foulkes, John Kramer, David Laidley, Edith Lessor, Ken McCarthy, Jeff Moonie, Noelle Morgan, Paul Simpson, Fred Stell, Tony Weston, Ken Winney and Harry Wright.

A further publication is planned covering all the Nepean River quarries and the author would be pleased to receive any further information, photographs or corrections. Please write to the author c/- P.O. Box 290, Burwood, NSW, 2134.

Persons Interviewed

Les Bickford: Employed as a fitter from 1937 at Depot and later Island workshops. Transferred to Penrith quarry 1955.

Gordon Brown: Employed from 1950 driving one of the White lorries.

Shirley Brown: Daughter of Darcy Riley, who was employed 1925-1966.

Don and Ron Clemson: Sons of Jack Clemson, living adjacent to the Island. Both joined the company prior to its takeover in 1948 and worked for varying periods on the Island thereafter.

Cecil Dews: Dragline driver 1927-1946, Island foreman and quarry manager 1947-1961.

Ken Luscombe: Operating the water pump for the Camasanees 1934-1935, firing locomotives 1936-1938.

Don Mahon: Employed from 1950 driving one of the White lorries.

Gladys Mitchell: Wife of Bob Mitchell, who was employed 1940-1975 as a lorry driver.

Alan McKern: Son of JT McKern, part time employee Rozelle bins and Sydney office 1930-1934, then fitter at Depot 1935-1939. island foreman and then quarry manager 1940-1954, manager BMI river quarries 1954-1961.

Anne McKern: Secretary in Sydney office 1926-1930.

John McKern: Son of JT McKern, worked three months as a dragline fireman in 1937, formed Howard Engineering in 1946.

Stewart McKern: Son of JT McKern, worked April to July 1946 as a fitters assistant after airforce discharge, then contract drove until 1950.

Bob Power: Farmed opposite Depot since 1924.

Dora Smart: Teacher Yarramundi Falls Public School 1937-1940. Married Roy Smart, Cleary Bros foreman 1937-1941, Dragline foreman then driver 1941-1958.

Bill Tierney: Employed from 1925 on shovelling and horse teams on Island, 1926-c1928 on ropeway and sand tractors, 1929-1940 Depot driver, 1940-1967 dragline driver.

Phillip Timmins: Employed 1925-1926 in Island powerhouse. 1927-1928 on sand tractors, 1928-1944 dragline driver.

Pat Willmott: Employed from 1943 on conveyor and later drove lorries and Ruston navvy.

Notes

1. Reinforced concrete in buildings (especially private construction) was rare before the Great War. One of the first notable uses was the floor slab for Sydney Central Station in 1903. Concrete roads followed. The first recorded successful use in Sydney was Alfred Street, North Sydney in 1918.
2. Major sources on NS&G's float were: *Australian Investment Digest* 1/7/1924, *Daily Telegraph* (DT) 18/10/1924 and agreement dated 17/5/1924 between J Richardson and NS&G and dated 18/11/1924 between W Percival and NS&G (both Corp. Affairs Comm. coy file 9055).
3. Stewart McKern recalls his father, JT McKern, ascribing the ropeway to the boards reluctance to risk the Nepean floods.
4. *DT* 18/10/1924.
5. *Windsor & Richmond Gazette (W&RG)* 19/9/1924, 26/9/1924, 3/10/1924, 17/10/1924 and 31/10/1924.
6. *W&RG* 24/10/1924 (ropeway material) and 31/10/1924 (bin plans).
7. *W&RG* 13/3/1925.
8. *W&RG* 10/4/1925. The siding was officially open for traffic on 18/4/1925. (Weekly notice 16/1925.)
9. *NSWGRW&RG* 5/6/1925.

10. Bill Tierney, Phillip Timmins, Cecil Dews and Alan McKern. The existence of the earlier narrow gauge railway was raised by Bill Tierney. Latterly 2ft gauge portable track has been found on the Island as well as other confirmatory evidence.
11. *Investment Digest* 1/10/1926, description from Phillip Timmins and Bill Tierney.
12. *Investment Digest* 1/10/1926. Detail from Alan McKern, Phillip Timmins and Bill Tierney.
13. *W&RG* 18/6/1926 and 23/7/1926.
14. Cecil Dews recalls commencing early in 1927 erecting the Marion. A notation has been seen in Mr JT McKern's handwriting that the Ruston entered service on 13/6/1927. Directors reported both in service by 30/6/1927. (*Investment Digest* 1/10/1927.)
15. Detail of 3ft 6in railway from photographs, Alan McKern and Phillip Timmins. A catalogue of the Wallaroo plant had been available for some time. (See *Industrial Australian & Mining Gazette* 20/3/24).
16. *W&RG* 28/10/1927.
17. Detail of Depot and railway; Bill Tierney, Alan McKern and Ken Luscombe.
18. All detail on NSWGR locomotives; *NSW Steam Locomotive Data book*. Locomotive names were never carried, NSWGR numbers being carried until later repaintings, though a picture does exist of 1104 with *Big Emma* chalked on the side tanks.
19. Bill Tierney and *W&RG* 14/9/1928.
20. Detail on locomotive and train working in this article have been based on an NS&C Account book which contains daily totals of stone trains over the years 1934-1940, NSWGR reported loadings and Bill Tierney, Ken Luscombe, Alan McKern and Les Bickford.
21. *Jobsons Investment Digest (JID)* 1/10/1928 and Alan McKern.
22. Alan McKern.
23. *JID* 1/10/1928, *W&RG* 14/9/1928 and Alan McKern. Sydney & Suburban Blue Metal Quarries Ltd was the other early user of a Symons cone crusher with a 5½ft installed cone in 1929.
24. State Metal Quarries; Memo from Manager SMQ dated 27/9/1921. Southern Blue Metal Quarries Ltd; Advertisement and comment thereon in *Construction* 16/5/1928.
25. *NSWGR Weekly Notice (WN)* 11/1930.
26. Alan McKern who was working in the Sydney office that day and typed the letter to the Union Bank.
27. The last reference to the use of the Fordson locomotives is W&RG 13/11/1931. On 13/1/1932 *Construction* lists an NS&G tender for supply of 700 8 foot sleepers with delivery to the 'sand pit, Richmond'.
28. Alan McKern and Cecil Dews.
29. Date of conversion to outside electricity supply and recommencing of sand production; NS&G Account book.
30. NS&G Account book.
31. Alan McKern.
32. Quarries Ltd had been formed in April 1934 with the directors of NS&GCL, ABMQL, E&PG&RMCL and S&SBMQL as shareholders. (Memorandum & Articles Quarries Ltd. CAC company file 15385).
33. Quarries Ltd and Minister of Public Works, Deed of Covenant & Charge dated 31/3/1936. The seven partners were NS&GCL, ABMQL, BMQL (a ABMQL subsidiary), S&SBMQL, E&PG&RMCL, CB and FBMQL. Each partners interest was based on its production over previous years (*DT* 16/11/1936). As CB and FBMQL did not have operating quarries the method of determining production quotas is unknown at this time.
34. Stewart McKern, Alan McKern and Les Bickford.
35. NS&G Account book, Dora Smart, Alan McKern and Ken Luscombe.
36. Les Bickford and Alan McKern.
37. NS&G Account book.
38. *W&RG* 5/4/1940.
39. Nepean Gravel Siding to Yarramundi Falls, CC Singleton. *ARHS Bulletin* 3/1938.
40. Bill Tierney and Alan McKern.
41. Alan McKern and *W&RG* 5/4/1940.
42. *SMH* 6/8/1940 (dock commenced) and *DT* 19/11/40 (building controls).
43. Dock Supply Agreement dated 26/7/1943.
44. *JID* 17/7/1944, Alan McKern and Pat Willmott.
45. Bill Tierney and Alan McKern.
46. Les Bickford and *WN* 37 and 38 of 1945.
47. *W&RG* 24/12/1946.
48. Stewart McKern.
49. *JID* 26/2/1948.
50. Alan McKern and Ron Parrott (BMI Company Secretary of this period).
51. Ron Clemson.

1630 overturned after being undercut by flood waters in 1956. The workshop behind it had been given a pointed end to minimise flood damage. However, trees cut down in the construction of the Warragamba Dam were carried downstream and punched holes in the walls. Photo: D. Clemson