

ACETATE OF LIME FACTORY, BULIMBA (Q'LAND.)

At the outbreak of the 1914-18 War, Australia was relying largely on imports of acetone from England or Canada for use in the production of explosives at the recently-established Cordite Factory, Maribyrnong (Vic.)

Very limited local supplies -- approximately 10 tons a year -- were available from the wood-distillation plant conducted by Cuming Smith & Co., at Warburton (Vic.). The Victorian product was satisfactory as to quality but, because of the small scale of operations, this local acetone was very costly.

Cuming Smith & Co. was encouraged to increase its output and was given an undertaking that the Government would purchase all acetone that could be made available up to 17½ tons annually for five years -- about one-third of the annual requirement for the expanded War-time programme of small-arms cordite -- and negotiations were commenced regarding the possibilities of increasing the total from local sources to 35 tons a year.

The Company offered to incur additional capital expenditure of about £7,000 and to increase the output of acetone to 35 to 40 tons a year, provided that the Government undertook to purchase that quantity for a term of years unspecified -- but 7 years was mentioned -- at £150 a ton. Canadian acetone at that time was costing £85 a ton.

In recommending acceptance of the Company's proposal, despite the disparity in price as compared with the cost of imports, Leighton drew attention to the desirability of having increased assured supplies of acetone from Australian resources, using Australian factory plant and Australian labor and thereby conserving Australian finances.

On July 28, 1915, a contract was signed covering the supply by the Company of 17½ tons annually of Australian-produced acetone at £200 a ton, subject to adjustment according to the landed cost in Australia of acetate of lime (calcium acetate) which was the most important material needed for making acetone. The Company was not prepared to undertake further increased production, however, because of uncertainty in obtaining acetate of lime from overseas.

There had been established at Maribyrnong concurrently a plant, based on details supplied by India, which provided for the recovery of acetone by the refining of waste liquids arising from the manufacture of cordite. It was expected that up to 40 per cent. of the acetone expended could be recovered by

To safeguard the availability of calcium acetate, however, an investigation was undertaken to discover a method of producing that material from surplus molasses arising as a by-product of the manufacture of sugar in Queensland. It was proposed to use a process put forward by Auguste de Bavay, a bacteriologist well-known in the Australian mining world, who undertook to develop the process.

By November 1915, de Bavay reported that there was no difficulty in producing annually 250 tons of acetate of lime, using 750,000 gallons of vinegar in the process. He recommended that the necessary capital be provided to set up a Government Factory to produce the vinegar from molasses rather than buying it from existing manufacturers of vinegar.

By mid-1916, work on the buildings and plant was proceeding at Bulimba, near Brisbane, and by 1918-19 the planned output had been attained under the direction of Manager J.F.X. de Bavay, son of the inventor of the process used in converting the molasses. Although the 1914-18 War was already over by that time, it was a matter of some satisfaction that Australia had thereby been made absolutely self-sufficient in the production of this essential war store.

It was at this stage, however, that the future of the Factory began to become indefinite. Processing of molasses commenced on September 8, 1918 and by June 30, 1919, acetate of lime to the value of £25,529 had been produced. Indications were that Factory operations might have been profitable if there had been a market for the total production. That was not, however, practicable, particularly as the immediate post-War pressures were for reduction of Defence expenditures of all kinds.

To assist the position, additional plant was installed at the Factory during 1919-20 to enable portion of the molasses to be used for the production of industrial alcohol, which was also used in the production of cordite, as well as for other manufactures. For the six months ended June 30, 1920, production of alcohol totalled 22,206 gallons. The acetate section was operated part-time only during this period to retain techniques and, to assist in the continued functioning of the plant, 2½ tons of sodium acetate was produced also.

The Factory problems were added to when the Explosives Factory, Maribyrnong was placed on a "nucleus production" basis. Production of acetate of lime was regulated to provide for the retention of the security reserve stock at not more than 850 tons. Other production during 1920-21 and 1921-22 comprised

the former year and 104,143 gallons of alcohol (including 84,326 gallons of methylated spirits) in the latter.

Early in 1922, however, a special review of the Factory's future became necessary under pressure from the Colonial Sugar Refining Company and other Australian distilleries who protested strongly against the policy of competition by a Government Factory in respect of supplies of methylated spirits for the limited Australian market.

They urged that continued production at the Bulimba Factory would result in the closing-down of some of the private distilleries. On the other hand, users of methylated spirit urged continued production by the Government Factory to protect them against exploitation by the commercial producers.

Annual capacity of the Factory at this stage was stated as totalling :-

500 tons of Acetate of Lime (convertible into 32,750 gallons of Acetone for 500 tons of cordite);

and

120,000 gallons of alcohol;

or

250,000 gallons of alcohol if the Factory produced only alcohol.

Reserve stocks of acetate of lime were adequate to meet all prospective Defence requirements for some years ahead.

Alternative courses which could be adopted to preserve the Factory as an effective unit to be available for further production of acetate of lime as and when required were :-

- (a) to lease the Factory to a commercial manufacturer of industrial alcohol;
- (b) to maintain the Factory on a nucleus basis; or
- (c) to operate the Factory to full capacity as a Government unit for production of industrial alcohol.

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The alternative was favored, particularly when Brodrigg pointed out that the industrial alcohol could be converted into motor spirit by the addition of 25 per cent Benzol (a by-product of the coke ovens at the Newcastle steel-works) and that the total Factory output could be readily absorbed by the P.M.G.'s and other Commonwealth Departments which operated fleets of motor vehicles.

This compromise was approved by the Government on January 24, 1924, with the understanding that the motor fuel would be supplied by the Factory at the equivalent price of petrol, adjusted in accordance with the relative mileage

as a Defence unit.

Production of power alcohol totalled 75,985 gallons in 1924-25 and 99,600 gallons in 1925-26. Demands for the fuel had increased to an annual rate of 130,000 gallons. Concurrently, operating costs were increasing and the price for petrol was dropping. The net result was increasing demands on the "Nucleus Vote", to the extent that it was decided to close down the Factory as at June 30, 1926 and to hold it on a care-and-maintenance basis.

Early in 1934, Leighton reported that acetone had declined in importance as a key raw material in the manufacture of cordite -- it was no longer employed in the production of Naval cordite and probably would not be required in future in any type of Military cordite other than that for 0.303" ammunition.

Furthermore, through the successful manufacture at the Explosives Factory, Maribyrnong of aeroplane dopes, the technique of manufacture of nitro-cellulose had been acquired and thus the production of a propellant explosive not requiring acetone could be developed if necessary - e.g. Naval SC cordite which was already being made.

He contended further that it would be cheaper to establish reserve stocks of imported acetate of lime than to incur capital expenditure in reactivating the Bulimba Factory; that there was sufficient acetate of lime already in stock to take care of the propellant needs for 223,000,000 rounds of ammunition; and that £1,000 annually involved in maintaining the Factory in non-operating condition should be saved by disposing of the establishment.

This action was approved. Factory plant and fittings with assessed values totalling £6,689 were transferred to other locations or sold and the Factory premises, with a book value of £39,523, were transferred to the Department of the Interior in February 1936 for disposal.