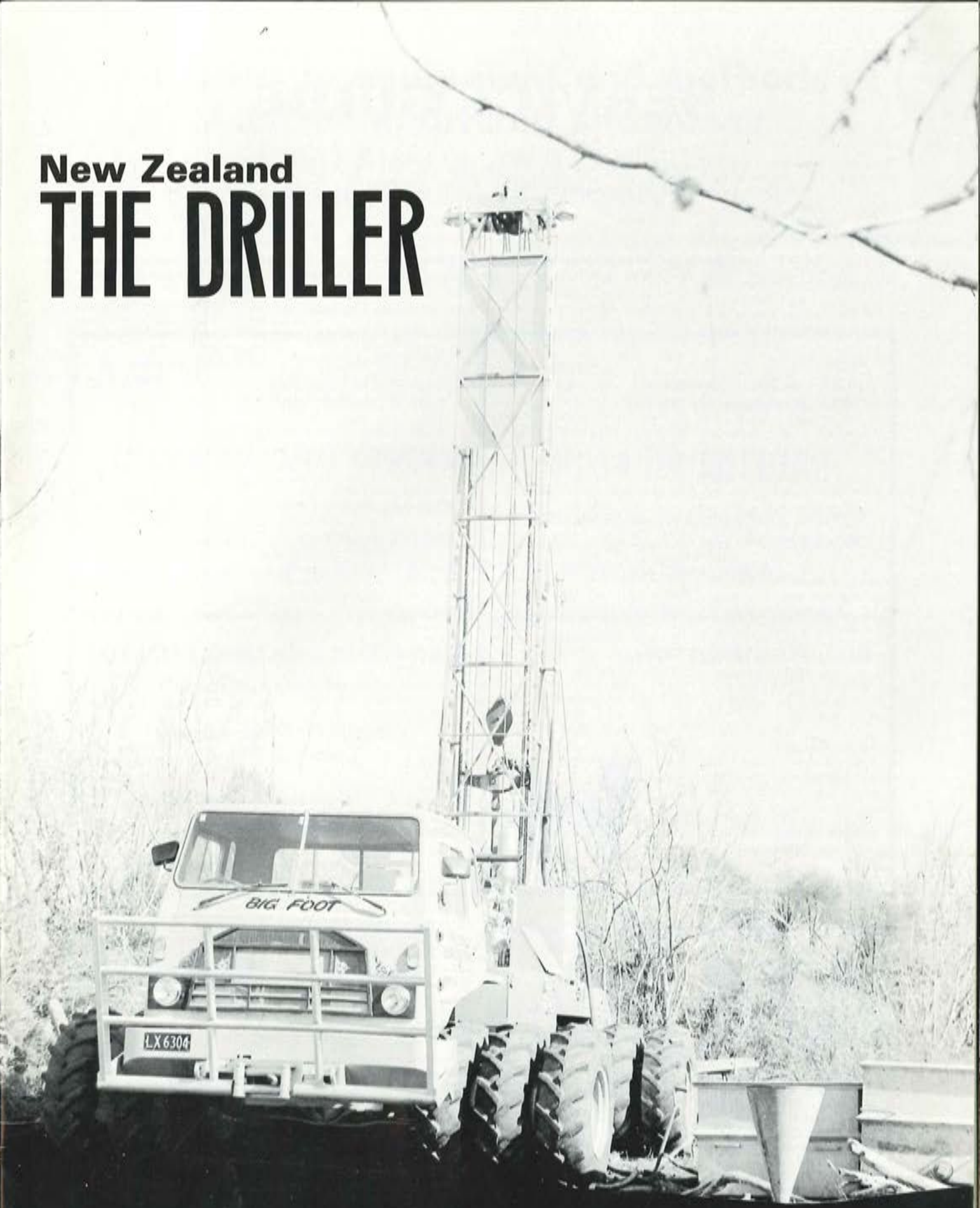
New Zealand

THE DRILLER



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JUNE 1985 ISSUE 13

SERVICE GUIDE

CONTRACTORS, CONSULTANTS AND SPECIALIST SERVICES

N.Z.D.P. Members are invited to promote their specialist skills and services to "N.Z. Driller" readers, using the card-type entries below. For further details on promoting your services to end-users, contact the National Secretary, N.Z.D.F., P.O. Box 1318, Hamilton.

COVER

Drillwell Exploration (NZ) Ltd's latest Gardner Denver Rig mounted on a fourteen tractor tyred all terrain all wheel drive Buggy currently working on an exploration contract on wet lands and peat swamp.

This vehicle also has tremendous power and climbing ability on steep sites. When mobilized on harder ground or on the road, its configuration is reduced to single tyres front and double tyres at the rear.

This vehicle or drilling carrier was especially built for Drillwell Exploration in 1984. For the technically minded the specifications are as follows: width of vehicle with all swamp tyres fitted = 4.72m, overall weight with drill rig mounted = 11 tonnes, full floating air bag suspension is utilized. Power is from a 380 six cylinder Ford Deisel driving through a Clarke six speed drop box power shift transmission to heavy duty Kirkstall differentials with diff locks, reduction hubs and independent brakes all round.

The transmission and differentials were especially imported by Drillwell for the building and assembly of this vehicle.

On swamp work this rig is backed up by a specially prepared multi tyred four wheel drive tractor and multi tyred swamp trailer for servicing sites and mobilizing equipment.

MEMBERSHIP GROWS

Council is pleased to welcome the following new members:

Cable Price Engineering
Penrose (Associate)

Wayne Little
c/- D.S.I.R.
Wellington (Employee)

David Clemence
c/- D.S.I.R.
Wellington (Employee)

Waikato Valley Authority
Hamilton (Associate)

New Zealand
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The latest in equipment and methods at Australian drilling showcase

Confident but cautious expectation was the prevailing atmosphere at the Drill '84 conference and exhibition held over five days from October 7-11 at the Canberra Rex Hotel.

The conference provided an opportunity for over 170 people involved in all aspects of the drilling industry to catch up with the latest information presented on suppliers' stands and through a comprehensive program of technical sessions.

The confidence referred to, punctuated an opening address given by the Federal Minister of Resources and Energy, Mr Peter Walsh.

"The Government's most important contribution to mining industry welfare comes from its macroeconomic policy. It is the creation of satisfactory conditions for economic growth and development that is a primary Commonwealth Government responsibility. In this area the Hawke Labour Government has been particulary successful to date, and anticipates further improvement in economic performance," said Walsh.

Organiser of the conference and exhibition was the National Waterwell and Drilling Association, a 12-month old body formed by an amalgamation of members of the former Australian Drilling Association and the National Waterwell Association. Registered under the NSW companies act just prior to the convention, the new association boasts over 600 members involved in contracting, consulting or supplying to the drilling industry.

Among foreign visitors to the conference were representatives from the Indonesian, Chinese and New Zealand Governments, Swedish suppliers Atlas Copco and Craelius, plus English Drilling Equipment and Weaver Hurt from the UK.

The best represented sector of the industry at Drill '84 was the equipment supply group, with virtually every major manufacturer displaying at their own stands or through those of their distributors.

Equipment on show ranged from large waterwell and mineral exploration rigs to smaller diamond drilling equipment and an extensive range of ancillary gear including drilling bits, hammers and casing, waterwell chemicals and submersible pumps.

Much interest was around by the new LM37 underground hydraulic diamond drill on the well-attended Longyear stand. The unit was on show for the first time at the exhibition after an extensive evaluation period.

Major features of the drill are inbuilt reliability and serviceability while retaining high output capacity. Designed for the export market as well as Australian use, Longyear has already sold four units to Northern American clients and one each to Holland and South Australia. Ray Cotterell from Longyear has nine outstanding foreign orders and expects this level of interest to continue for some time.

Other new equipment graced the Krupp Australian stand. On display for the first time was a range of down-the-hole hammer pieces from Krupp Widia, the company's drilling and tunnelling accessories division. Supplied in a range from 3½ to 17 inches, Phil Black from the division claims the button bits can be from five to 20 percent more cost effective than competing equipment. Quality control is guaranteed since all manufacturing processes including tungsten carbide sintering are carried out under one roof at Widia's plant in Essen, West Germany.

Another product commanding attention at the stand was the company's multi-stage reamer bit developed for blast hole work and already widely used in the open-cut coal industry. Black says the bit has good potential for waterwell contractors working sedimentary rock formations.

Krupp also displayed a range of PVC screens manufactured by Pumpenboese, Hannover. Since last year's exhibition in Surfers Paradise, many in the industry are keeping tabs on the product and its cost and handling advantages over conventional metal screens.

Two novel products for waterwells were introduced by Victorian distributor Southern Exploration and Drilling Supplies Pty Ltd. The Wellmaster rising main is an alternative to steel and PVC risers developed by Flexible Pipelines of the UK. The riser consists of a circular woven hose supplied in lengths to orders with two, three or four inch diameters. The riser can be used with any submersible pump to a depth of 200 metres, provided that the operating head does not exceed 21 bar. John McLean of Southern Exploration and Drilling expects the riser's corrosion resistance and easy installation to speak for themselves in the market.

The company's other new product also offers corrosion protection plus easier handling and is a fibreglass will column and rod assembly for use in windmill waterbores, made by South Australian industrial fibreglass specialist Chemline Pty Ltd.

On display in the outside exhibition area was an Onram 500 hydraulic diamond rig from Trifus Industries. Imported from Hagby Bruk AB, Sweden, the machine represents a new concept for small high speed diamond units that can either work underground or be trailer mounted. Two machines are currently operating in Australia, one being sold to Parkes, NSW, contractor Paul O'Neill of Donril Pty Ltd and the other being under evaluation by the Zinc Corporation.

Also in the flesh was a Rotamec 50, one of Atlas Copco's rotary rigs used throughout the world, and a Diamee 700 from Craelius.

Featured on the Atlas Copco indoor stand was a wide range of Swedish drilling gear including Sandvik roller bits for medium hard rock and eccentric drill bits for use in the ODEX drilling method. The ODEX method where casing tubes are placed simultaneously with drilling was developed jointly by Atlas Copes and Sandvik to handle tricky overburden work.

Following an industry trend for contractors to tender for a wider range of drilling work, suppliers of multi-purpose rigs were evident at this year's show.

"Pressure and demands from within the mineral exploration industry have been the main contributing factors in the marked swing to multi-purpose surface rigs", says Russell Parsons of South Australian based Specialised Drilling Services Pty Ltd. "Today at least 50 percent of private contractors operate multi purpose rigs and therefore, offer a complete service to the mining industry".

Specialised Drilling is a joint venture operation with the West German manufacturer of rotary drilling rigs, Wirth GmbH. Wirth claims that its equipment has a universal range of employment.

Literature on other multi purpose rigs was available at the Mole Engineering and Bourne Group stands.

Mole manufactures the Pioneer P400 series of all hydraulic, general purpose drills that can be truck, skid or trailer mounted. Designed and manufactured in Australia, all three machines in the range feature centralised control systems and are designed for simplicity of operation using a two man crew. Hank Van Der Woude from Mole says the units offer maximum value for money whatever the drilling requirement, down-the-hole hammer, small-bore reverse circulation, wire line sampling on open-hole augering.

The most comprehensive range of Australian-made drilling equipment is available from the Bourne Group. The company designs and builds rigs from the ground up using a very high percentage of local components.

According to Ashley Tuton, any apathy to equipment produced in Australia is quickly disappearing as the industry continues to incorporate world leading operating techniques into the design of new rigs and accessories. Bourne recently supplied the first twin feed drill, a 1000 THD model, in Australia to an Adelaide contractor. The company claims to have about 25 percent of the market.

Bourne also recently collaborated with another Australian manufacturer, Gemco, to supply 25 drilling rigs as part of a $9 million Australian aid program to Bangladesh. By joining forces the companies were able to meet tough Australian Development Aid Bureau specifications. Bourne points to the sucess of the tender as an indication of the scope for similar ventures in the future.

Gemco drilling equipment is manufactured at the George Moss Pty Ltd works in Perth. The company is also well known for its underground mining equipment. Gemco built

Australia's first hydraulic drive rotary drill and since then has stuck to a philosophy of providing multi purpose rigs of all sizes. The drilling division also supplies a complete range of down-the-hole equipment and represents in Australia the English Drilling Equipment Company, best known for its electro-hydraulic machines primarily used for methane drainage in underground coal mines.

A full range of waterwell, dewatering and mining screens was presented by Screen Products Pty Ltd. Although only established in Australia for 18 months, the company claims to have captured a healthy slice of the market due to the price competitiveness of its produce. Eddie Hart, national marketing manager, says the equipment, which is currently imported from Singapore, will be even keener priced once screen production starts in Sydney early next year. The company has on order a state-of-the-art, fully automatic fabricating machine.

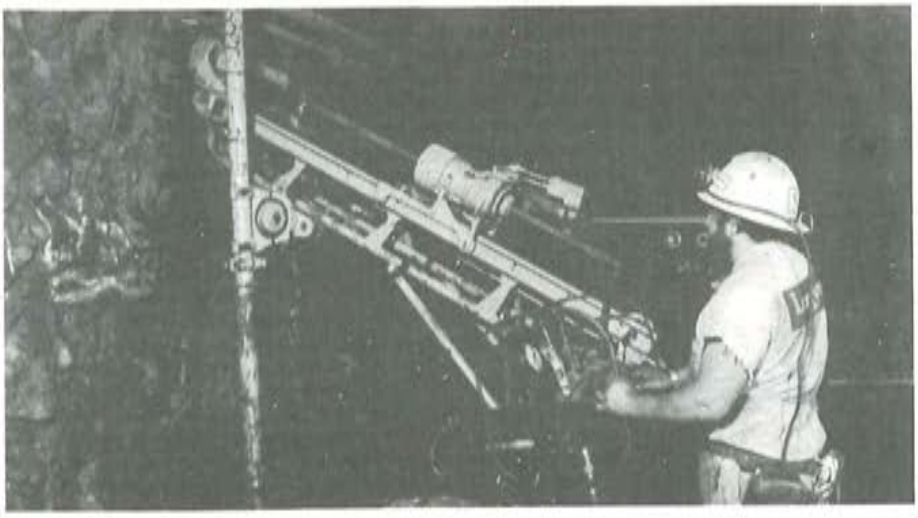
Newcomer to the exhibition this year was DB Petroleum Mining Services Pty Ltd, the Australian arm of Belgium based drilling equipment manufacturer Diamant Board. Only incorporated last year the company is supplying mostly petroleum and diamond drilling gear.

Hydraulic core ejector

DESIGNED FOR THE SURE AND SAFE RETRIEVAL of cores from barrels, a new hydraulic device has been developed by Cotefield Engineering Ltd U.K. It is intended that the hydraulic power should be provided by an off-take on the drill rig or tractor. The device consists of a hydraulic ram with a 12 inch stroke, which bears on the core, the core barrel being retained by an interchangeable adapter screwed into the end of the cylinder; adapters are available for any core barrel in common use, it is stated. Mounted on the side of the cylinder is a control valve providing progressive increase in pressure so that difficult or crumbling cores can be eased out very slowly, if required. Maximum force applied by the ram is 10 tons. A pin connection between ram and piston rod permits the travel to be increased beyond the 12 inch stroke. Mounting holes are provided on the two base plates.

PROVEN HIGH-TECH HYDRAULIC UNDERGROUND DRILL TAKES INDUSTRY BY STORM

The highly portable, State of the Art Longyear LM37 is revolutionising the drillers life underground with 25 hp at the chuck, Mechanized rod handling, high reliability, ease of operating design and modular concept for transportation simplification. In other words it's a breeze to use.



The drill is available with a standard feed frame of 6 feet for long core runs and fast rod handling or a short feed frame (3.3 ft) when confined spaces are a restriction. Automatic rod handling is in the order of about 200-230 feet in five minutes (6)-70 metres) with the 60 foot feed frame. Depth capacities are approximately.

System	Hole Direction Vertical Up m	Vertical Up ft	Horizontal m	Horizontal ft	Vertical Down m	Vertical Down ft
LTK46 (or TT 46) with LTK rods	350	1150	450	1475	625	2050
LTK56 (or TT56) with LTK rods	300	985	400	1315	500	1640
AW 34	450	1476	600	1970	700	2296
BW 44	225	738	400	1315	400	1312
AQ	250	820	400	1315	400	1315
BQ	200	656	350	1150	325	1066

* Based on straight, clean holes. Actual hole depths depend on in-hole and equipment conditions as well as on drilling techniques used, and may vary from above guidelines.

To cap it all off self diagnostic hydraulic circuitry uses logic control for easy of maintenance and fault finding.

From the Presidents desk

Dear Members,

Since Publication of our last magazine you will all have received from our Secretary a circular asking for details of your fleet and rig capacitys and estimated replacement values. If you have not replied please do so immediately. Any information you may have on the yearly running costs of your rigs and runabouts would also be of great help. With all this information tabulated, Messers Coopers & Lybrand will be able to formulate a rig costs scale. We will then be able to get regular information on percentage increases to cover rising costs.

For example I use the road transport figures to assist in calculating my price increases. A rig that had a charge out rate of $65.00 per hour in January 1984 should now be charged at $84.05.

e.g.

January 1984	Rig Charge Hourly	= $65.00
1 March 1984	Road Transport Increase of 1.6%	= $66.04
1 April 1984	3.1%	= $68.08
31 May 1984	2.0%	= $69.44
11 Aug. 1984	3.3%	= $71.73
29 Nov. 1984	1.9%	= $73.09
11 Feb. 1985	15.0%	= 84.05

The cost of running trucks is somewhat similar if not as costly as operating Drilling Rigs.

Now how many of us have increased our rates by the above margin? If we have not now we know why we are not making much profit.

You can now see why it is so important to return to us any relivant costing you may have on running costs of your rigs. Regardless of what you charge per hour or per meter you will have a formular to regularly increase costs to keep up with inflation.

I have recently been speaking with Rod McCallum from Sydney and he has asked me to inform all New Zealand Drillers Federation Members that the registration for Kiwis is Australian $330.00 not USA $380.00 as shown in the Game 85 Pamphlet. Rod advises anyone travelling to fly via Sydney with the Australian Group to take advantage of concessionary air fares.

Good drilling.

Bill Washington

New range of Submersible Pumps

A new range of lightweight yet powerful submersible pumps has recently been released on the New Zealand market.

Manufactured by Yamaha Motor Co of Japan — probably better known here for its top quality motorcycles and outboard motors — the pumps are available in three sizes with maximum discharge rates between 85 litres and 200 litres (19 and 44 gallons) per minute.

The electrically driven pumps may take power either from the mains supply or from a portable generator, and are suitable for a wide range of applications from irrigation and general farm use, to pumping tasks on construction sites, and washing down vehicles or machinery.

Three models are available:
YP100: 85 litres/minute, capacity, 25mm (1 inch) discharge, weight 4.3kg (9.5lbs) retail price $219.
YP250: 180 litres/minute, 40mm (1.5 inch) discharge, weight 15.5kg (34lbs) retail price $336.
YP400: 200 litres/minute, 50mm (2 inch) discharge, weight 20kg (44lbs), price $350.

The pumps are available through Yamaha power products dealers throughout New Zealand.

Yamaha power products also include portable generators and multi-purpose engines. Mervyn Sharp, general manager for the importers, Moller Yamaha Limited, says dealerships for the range are still available in some areas.

Issued for: Moller Yamaha Limited, P.O. Box 7034, New Plymouth
Through: Hamling & Marlow Public Relations Limited, P.O. Box 6995, Wellesley Street, Auckland
Contact: Peter Hamling (09) 792-631.

A Yamaha YP250 submersible pump in use in a construction site application.

Channel-Side venue for Major Tunnelling show

Britian's most important tunnelling event, the Tunnelling 85 International Exhibition and Symposium, took place at the seafront Metropole Centre in Brighton between 12 and 15 March. The attendance of nearly 800 included 104 visitors from 23 overseas countries and was, according to organiser CB Technical Exhibitions (1), of exceptional qualtiy.

More than 50 leading British and European manufacturers and suppliers took part showing equipment, materials and services from around the world concerned with underground excavation and tunnel construction, repair and maintenance.

It was the fourth show in the series, held every three years, and was appropriately situated in a venue directly fronting what will probably provide one of the industry's most exciting tunnelling projects — the English Channel. Two schemes — a twin tunnel rail only link and a combined bridge and tunnel for trains and road vehicles — are reported to be candidates following a recent Anglo-French governmental study which emphasised that the finance must be raised privately.

The design and construction of tunnels in mining and civil engineering was the theme of the symposium, organised by the Institution of Mining and Metallurgy (2). Speakers from many parts of the world discussed major projects including mining, road, rail and hydro tunnels in Sweden, Federal Germany, Portugal, Canada, Hong Kong, China, Japan and Britain. A number of case histories involving tunnelling machines were presented, and five papers introduced new grouting methods. Two technical tours covering sites in Britain and Europe were available for delegates following the end of the symposium.

A major talking point at Brighton was Perard Torque Tension's (3) new computer controlled electrohydraulic drill rig. The British mining industry is soon to take delivery of two models, said by the company to be the first computer controlled drill rigs to be purchased for commercial use anywhere in the world.

The rigs will provide many benefits for users, states Perard, including optimised selection of drilling pattern and application of explosives to reduce overblasting and increase tunnel stability; less afterwork to secure the tunnel; reduction of waiting time including rigging, surveying and marking on the face; monitoring of drilling conditions and penetration rates for optimum adjustment; and controlled manoeuvring of the booms to reduce maintenance time and cost.

Control System

Designed for ease of operation, the control system consists of a microprocessor based control unit; operator's panel with joy stick controllers; visual display unit for graphic display of drilling plan, directions, penetration rates, alarms and other aids; sensor units; and hydraulic power pack with electrohydraulic control valves for controlling boom movements and drilling.

The system is controlled from a sound insulated and heated operator's cabin. Three sizes of boom are available covering the most common sizes of tunnels. The makers say that the booms can be mounted on any kind of chassis according to customer requirements, and the number of booms can be varied.

Tunnel descriptions and drilling plans are stored in the control system's memory, and are selected by push button. Precise drilling without precise positioning of the rig or marking on the tunnel face is aided by use of a laser beam.

A Washington Drilling Ltd rig at work in the river channel fault area of the Clyde dam site. Washingtons carried out drilling in preparation for the placement of stressed anchors to provide temporary support for the latter stages of the river channel fault excavation. A section of a bottom bend of penstock for the Clyde powerhouse can be seen on the upper left of the photograph.

Wire wound stainless steel well screen

A WIRE WOUND all stainless well screen which is claimed to greatly improve water quality and production yield has been introduced by International Drilling Services Ltd U.K. Called IDS/Con-Slot, the screen is claimed to have major advantages over normal well screens. The stainless steel construction ensures long, maintenance-free life with no corrosion problems — unlike conventional screens with little more than a protective coating which is so often damaged during installation, it is stated.

A choice of slot size down to 0.05mm (0.002in) ensures optimum production and consistent water quality — the sizes available allow installation with or without gravel pack, and desanding of new wells is greatly simplified.

IDS/Con-Slot is designed for maximum strength — stainless steel V-profile wire is wound and individually welded to support rods at each crossing, making it impossible to unwind. The welding is to such fine tolerances that a precise V-shaped slot is left between the surface wires giving excellent water flow pattern and sand control. This configuration of support rods and profile surface wire can be engineered to meet the collapse and column resistance requirements of any down hold condition, it is stated.

IDS/Con-Slot is part of a complete water well package comprising packers, extension pipes, controllers, bottoms and shoes available in standard sizes up to 820mm (32in) diameter.

Versatile Drill Rig

An Australian company, Glindemann and Kitching (Holdings)Pty Ltd, seeks international sales for its versatile G and K 850 drill rig.

To this end the company is seeking suitable agents with strong connections in the related industries.

The drill is a multi-purpose unit that can be used for water well drilling, rotary percussion drilling using air, diamond core drilling and, blast hole drilling.

The G and K 850 rig has the capacity to drill to 1100m (3600ft).

It is highly reliable and in the event of maintenance work being required this often can be performed by the operator, minimising the need for repair specialists.

A submersible pump available from the company similarly offers low maintenance.

The drill rig mast has a fully welded lattice frame which allows for a 9m (30ft) rod pull. It has a 6m drilling stroke and the ability to drill angle holes.

The mast locks securely from 55 degrees to 90 degrees at five degree intervals.

Drive head consists of a three speed spur gearbox capable of more than 6500N.m (4800lbf.ft), with a speed range of eight rpm to 1000rpm.

It has a hollow spindle with 58mm (2.4in) inside diameter and 2 7/8in API (American Petroleum Industry) thread.

Drill head assembly is on a sliding unit which can be shifted 460mm (18in) from the mast centre to allow the hoisting of drill rods and to assist in setting up over an existing hole.

Wireline and water pump are built into their own chassis, which can be removed from the rig platform by four bolts. the wireline is mechanically driven by its own engine and is equipped with a clutch allowing the unit to be capable of free-falling.

The water pump shares the wireline's engine. This safety precaution is taken so that in the event of a main engine failure, the drill hole can be circulated with water to prevent the possible loss of drilling rods and equipment.

A configuration of the rig also is available with a mast-mounted wireline winch and water pump, both hydraulically driven. This clears the front of the drill platform to allow mounting of an air compressor or large mud pump.

Further enquiries: Mr W. Unger, Glindemann and Kitching (Holdings) Pty Ltd, 243 Forrest Street, Kalgoorlie WA 6430.

Issued on behald of Australian Trade Commission, Private Bag, Auckland by Findlay, Kitching & Associates Ltd, P.O. Box 381, Auckland. (Roger Magee phone 793-480)

Australian company, Glindemann and Kitching (Holdings) Pty Ltd, seeks sales for its versatile G and K 850 drill rig (pictured). A multi-purpose unit, its versatility offers tremendous savings when working in remote areas, as is often the case: and it is easily maintained.

Johnson screens

What's new about Johnson's Revert?

The special features that have made Revert the pro's choice around the world remain unchanged. It still prevents damage to formations caused by mud plugging. It still lets cuttings settle in the pit 50 per cent faster. Still reduces friction losses, allows non-contaminated sampling and better electric logging.

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DD

Soviet Drilling Equipment retains the lead

The new Soviet oil and gas-well drilling equipment dramatically improves the technical characteristics and cost effectiveness of drilling operations. According to experts of the Drilex firm and of the Alf Aquitaine state company (France), the Soviet D-172 rotary downhole motor which ensures effective high-speed drilling is the best in the world.

By 1985, the Soviet Union will be annually producing 630 million tons of oil, including gas condensate, and 630 billion cubic metres of natural gas. Over 85 percent of all wells are sunk by downhole motors of the rotary, turbine and electric types Soviet drilling equipment is quite popular in the socialist countries, Algeria, Belgium, Iraq, Mexico, Turkey, West Germany. It has also gained strong acclaim into the oil and gas-fields of Canada, France, Japan and other countries.

There is a host of other drilling methods to be sure. However, according to specialists, traditional rotation drilling with the help of rolling-cutter and diamond drilling bits will remain the most cost-effective technique in the next few decades. There are actually two rival directions in this field: rotary drilling when the drive engine is mounted on the surface and when rotary motion is imparted to the rock-cutting tool (the bit) via a drill stem; and downhold drilling when the drive is directly coupled with the bit and is lowered into the well, while the stem remains stationary.

The world's first turbodrill was designed by Soviet engineers in 1922. Since then, all principal ideas in the field of downhole drilling techniques have been put forward in the USSR. Turbine motors have proved to be fairly mobile and allowed the use of stems assembled of lighter and cheaper pipes. The new method has helped develop a four times higher rate of penetration compared to rotary drilling with about the same productivity per bit.

With the development of hard-alloy crown bits in the 60s, and of jet drilling bits which did not fit to turbodrills at first, the technical and economic characteristics of rotary drilling improved, too. Its lag compared to turbine drilling in the rate of penetration was substantially reduced, while productivity per instrument trip went up. There were two ways to give back the leading role to turbodrills: to reduce the torque or to design new extra-hard rock-cutting tools operating at high torque.

The staff of the National Drilling Equipment Research Institute fully exploited both opportunities. By reducing the axle's speed of rotation and increasing the axial load, they managed to secure a dramatic increase in footage per bit, bringing it close to the figures attained in rotary drilling. The speed of drilling with the help of low-torque mechanisms is about 3 times higher.

The classical high-torque drills have also come to hit their prime with the emergence of new rock-cutting tools with diamond and polycrystalline inserts which do not only allow but actually require increased speeds of rotation.

The development of multiple-cut rotary motors of the D series came as a new stage in the advancement of drilling equipment in the USSR. They have a clear advantage over foreign-made single-cut motors in terms of design and power characteristics. Although the speed of the tools rotation is twice lower than that of the turbodrill, the rate of penetration has remained practically unchanged: the high torque has helped increase the load on the bit. With the help of these rotary motors, oil-workers sink slanted wells 2,400 to 2,600 metres deep with just 5 or 7 bits, while with the ordinary rotary method as many as 10 or 12 bits are required.

Soviet inventions in the field of drilling equipment are patented in many industrialized countries and have become an object of licence deals. In particular, the Soviet Licensintorg foreign-trade association has signed two agreements with the Drilex company which provide for the delivery of rotary downhold motors and spare parts to France, for the handover of design and technological documentation and knowhow and for Soviet technical assistance in arranging the equipment's operation.

"Multiple-cut rotary motors make a real revolution in oil and gas-well drilling techniques", Drilex General Manager Guy Onetto said. "Today, to strike oil, one has to penetrate increasingly deeper into the ground or sea-bed. With ordinary rotary drilling the whole system penetrating inside is rotating. The Soviet designers now have produced downhole motors which impart the rotary motion to the bit alone. This helps drill not only vertically, but change the direction of drilling at the required depth, too. This saves time and, consequently, money. We have bought 26 ready-made units, have tested them in various conditions and operating modes and have ended up with time savings of up to 40 percent."

Novosti Press Agency

Multiple Drilling Rig

By Evgeny Egorov

A team of soviet experts has been awarded the 1983 State Prize of the USSR for the development and introduction into commercial practice of a drilling rig which ensures a high rate of growth in the drilling operation and production of oil in Western Siberia.

Western Siberia produces over a half of petroleum and gas condensate and is the main source of these raw materials in the USSR. When Siberian petroleum was found in the early 60's, some Westerners speculated that decades would be needed to explore the fields because of extreme natural conditions (the oil fields are located in the middle of taiga under deep bogs which do not freeze even at 50°c below zero).

Reality has refuted such forecasts. A million tons of petroleum was produced here in 1965, while in 1975 the figure reached 148 millions. In 1983 a million tons of petroleum was being extracted daily.

These rates of development of the petroleum industry are unparallelled in the world. They have become possible owing to the huge resources allocated for the Siberian fields, the advanced equipment and technology used and the selfless labour of workers and engineers.

The experience of exploitation in the oil fields in Western Siberia teaches that the multiple drilling method is most suitable under such conditions. This method drastically cuts expenses for preparing the drilling sites and laying routes of approach and power transmission lines; and it increases the rig capacity and reduces well construction costs. Conventional rigs are not designed for multiple drilling while modernizing them would require considerable expense and additional amounts (up to 200 tons per rig) of metal.

A radical new rig to meet the requirements of multiple drilling and operating conditions in Western Siberia was constructed in 1977. The rig is known as BU 300 EUK which stands for "drilling rig with electric drive and universal mounting for multiple drilling".

The Urals Plant of Heavy Machine Building named after Sergo Ordzhonikidze, the Ministry of Petroleum Industry of the USSR and several institutes and enterprizes of other ministries participated in the project.

The powerful hoist and pumps of the rig, the high level of mechanization of servicing operations and the possibility of increasing the string of pipes by stand sections (this for the first time in the world) have provided an increase of 30 to 35% in the commercial drilling speed. The rig has given a good account of itself on soils with low carrying capacity. Due to its original tower unit alignment mechanism the drilling equipment can be fixed at the desired angle. The rig is stationed on filled islands and the wells obtained by controlled directional drilling run on different sides off the island.

Basic Specifications of BU 3000 EUK Rig

Gross weight	662t
Nominal drilling depth	3200m
Number of holes in cluster	8-16 and more
Drill pipe diameter, mm	114, 127, 140, 147, 178, 203
Nominal length of stand, m	25
Hoist drive power, KW	700
Pump mechanical power, KW	600

About 400 such rigs are currently operating in Western Siberia providing over 10 million meters of drilling wells annually. Owing tothe use of new drilling rigs the petroleum output in the region increased by 430 million tons between 1978 and October 1982. They have already produced a saving of over 200 million roubles. All the new fields are being worked using such units.

(Novosti Press Agency)

1985/86 NZ Antarctic Research Programme

The Minister of Science and Technology, the Hon R.J. Tizard, has announced Government approval of proposals submitted by the Ross Dependency Research Committee for the 1985/86 New Zealand Antarctic Research Programme.

The Programme, to be implemented by Antarctic Division, DSIR will maintain New Zealand's Antarctic Scientific Research activities and the Scott Base Rebuilding Programme at a comparable level to that of last year.

Participating organisations undertaking research projects will include twelve Government Departments and five New Zealand Universities. Two independent agencies and some guest foreign scientists will also be working with the New Zealand Programme.

The Scott Base Rebuilding Programme will involve construction of a workshop complex with an area of some 180m². This work will be undertaken jointly by Antarctic Division, the Ministry of Works and Development and New Zealand Army Engineers.

A major logistics contribution to the New Zealand Antarctic Programme will again be provided by the Ministry of Defence and will involve RNZAF Hercules flights, exchange air crews with the US Antarctic Programme, cargo handling and crash fire crews, as part of the joint New Zealand/United States Antarctic Logistics Agreement.

This coming summer New Zealand scientists and field staff will undertake forty-five scientific field and laboratory projects with some events still under consideration and subject to available logistics support. Scientific studies will cover a wide range of disciplines including earth, atmospheric and living sciences. The seismic, meteorological and upper atmospheric recording laboratory programmes at both Scott Base and Vanda Station will continue.

Plant, equipment and supplies required for a continuation of the CIROS Geological Drilling Project in 1986/87 will be transported to Scott Base this summer. Drilling operations are scheduled to commence in September/October 1986.

At Scott Base and Vanda Station, forty staff will provide essential services including meteorological reports and radio communications in support of scientific activities being undertaken in the region.

A number of New Zealand scientific projects involve close co-operation with the US Antarctic Programme including joint programmes at Cape Hallett and the Beardmore Glacier. New Zealand and United States field safety personnel will also combine to form a search and rescue team and provide survival training for both New Zealand and American scientists and field staff working in Antarctica.

BACK-UP

Triplex mud pump

Added to the range of drilling pumps available from Drill Supply Ltd U.K. is a new 5 inch stroke triplex mud pump designed and manufactured by Conrad, Holland. It is stated to be lighter and more compact than the 5 inch x 6 inch duplex model which it replaces, and the three-cylinder design delivers a much smoother flow of drilling fluid.

This 45hp pump CT 5050/45 can be equipped with liners of 3, 3½, 4, 4½, or 5 inch diameter. Within the power limit, output ranges from 50 Imp. gpm at 60bar with 3 inch liners, to 147 Imp. gpm at 25bar with 5 inch liners. Weight of the pump is 975kg without skid and its overall dimensions are 1,538mm long, 920mm wide and 623mm high. It can be supplied with a skid for the pump itself, or with a skid for the pump and diesel power unit. Optional equipment includes a discharge pulsation damper, pressure gauge and safety valve. Inlet diameter is 4 inches and outlet 3 inches.

Now Masport Onga bring America's biggest-selling submersible pump to New Zealand.

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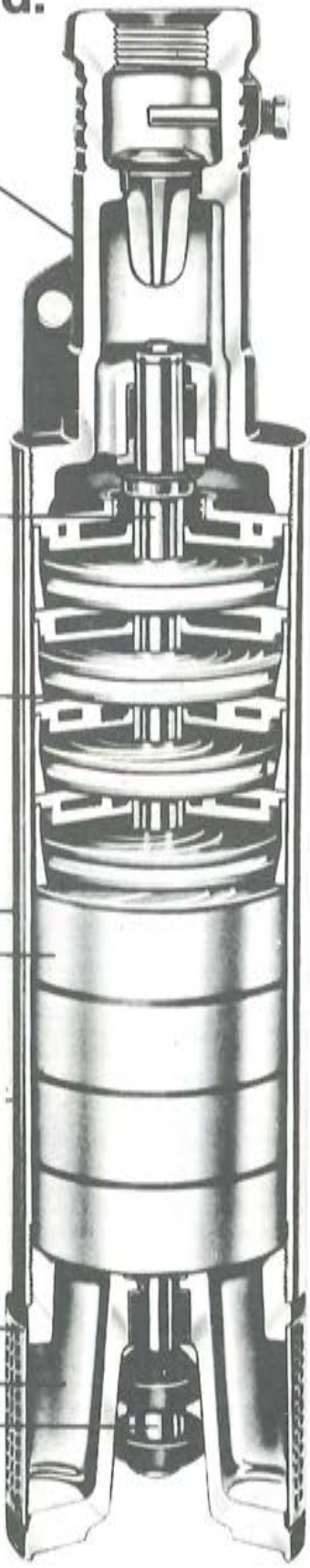

DISCHARGE CONNECTION – Close grained cast iron construction provides smooth water passages for maximum efficiency . . . incorporates trouble-free bronze poppet type check valve with bronze seat. Non-mechanical design assures years of trouble-free dependability. Design series 40 units include threaded check valve. Cutless type fluted rubber bearing maintains proper shaft alignment and assures superior sand handling capabilities.

STAINLESS STEEL PUMP SHAFT – Precision ground for exact bearing fit and straightness. Full length key-way provides positive impeller drive.

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DIFFUSER SPACER – Assures precision build-up while maintaining proper internal clearances.

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In aggressive conditions, such as sandy water, Sta-Rite pumps are especially reliable. The impeller rings,running their whole length in bronze bearings,restricts sand from the impeller neck . . . the most vulnerable area. ***That's thoughtful engineering!***

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SR1

Logging down holes

In Britain the concept of logging a hole seems to have taken on in that only 10 percent of the holes are cored while the balance are logged. Something of an opposite case seems to be the situation in South Africa according to Peter Charnaud who runs Rand Geologging in this country.

Rand Geologging is a UK-based company specialising in the field of borehole geophysics, wireline logging and while the principal activity of Rand Geologging is in coal exploration the company has also worked on hydrogeological investigations and on civil engineering applications. The company operates with a landrover based geologging unit which is equipped with a nine track computer with recording facilities and some multifunction tools which represent some of the most sophisticated logging technology available today.

At the heart of this system is the Formation Density Sonde which features long spaced density, short spaced density, bed resolution density, caliper, natural gamma, temperature and differential temperature. These are all recorded in a single run down the borehole which reduces rig downtime.

The Rand Geologging system is said to be one of the most advanced coal logging systems currently available in Southern Africa. The equipment is digital and 'depth based'. This means that data is sampled and recorded throughout every centimetre of the borehole opposed to the conventional system which records continuously, ie, on a time base and then converts data to depth. By working entirely within the 'depth domain', Rand Geologging have eliminated the inevitable smearing, aliasing and skewing of problems associated with time to depth conversions at the surface. Microprocessors down the hole and the surface, a new concept in slimhole logging, make possible the depth based logging system. This means that the company can use a sophisticated system of digital transmission of data to surface. This results in complete integrity of the data is it is finally presented on the chart recorder and several functions become routine operations and lead to a cleaner and more accurate log presentation and make the work of the geologist or log analyst considerably easier.

Rand Geologging also offer a complete interpretation service to back up their hardware. Geotechnical interpretation techniques, identification of lithology, coal quality and others make up the range of services offered by the company. The geotechnical technique generates conventional geotechnical data inexpensively and can reduce significantly the cost of laboratory analysis and time spent by potential clients on routine rock quality measurements. Current geophysical logging systems for coal exploration facilitate the determination of coal quality and rock lithology parameters but there are few successful techniques determining from geophysical logs how the rock quality and strength information can be directly related to mining data.

Exploration programmes also form part of the Rand Geologging's service and geologists can be called on in Southern Africa for advice on possible exploration as well as the undertaking of geological management and the provision of geological field personnel.

Regional Groundwater Investigations by the Waikato Valley Authority

The Waikato Valley Authority has the statutory functions of water resource management and protection within its area. To perform this role in respect of groundwater the Authority is presently engaged in a programme of Regional Groundwater investigation in the following areas.

(a) The Hamilton Basin where extensive use is made of groundwater with steadily increasing demands to match horticultural and industrial developments.

(b) Pukekohe, Tuakau, Waiuku and Pukekawa (South Auckland) areas where irrigation demands are placing stresses on both surface streams and groundwater systems.

(c) Tokoroa — Kinleith: An area of municiple and industrial groundwater use with special problems of groundwater quality.

The objectives of the Authority's Regional Groundwater Investigations are to define the various groundwater systems, document potential yields, identify areas of water stress and develop a series of management guidelines which will form the basis of future water management policies in the various areas.

One of the most important components of information gathered during a regional groundwater study is the information supplied by drillers, usually in the form of a drill log.

A good, detailed driller's log can provide not only geological information, but details of potential use and behaviour of aquifers encountered, as well as documented bore construction. to encourage drillers in the collection and recording of such information the Authority has standard bore-logging books which can be made available on request. In addition Authority staff are able to advise drillers as to procedures for bore testing; a process likely to become increasingly important for bores where water rights are involved.

The Waikato Valley Authority recognises the mutual benefit of close co-operation between drillers and the Authority in order to pursue efficient and equitable groundwater management planning. The Waikato Valley Authority has therefore recently become an associate member of the N.Z. Drillers Federation and looks forward to increasing communication with its members.

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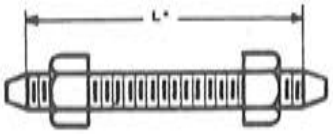

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ROAD USER CHARGES

Amount collected by Government

In the Government summary of the receipts and payments of the public account for the six months ended 30 September 1984 which was released in the Supplement to the New Zealand Gazette dated November 30, 1984, is the financial statement of the National Roads Fund.

The amount of Road User Charges collected for the National Roads Fund for the first six months (1 April to 30 September 1984 inclusive) was $87.6 million. If the same level of Road User Charges are collected for the remaining six months of the financial year the total for the year will be $175.2 million at the rate applied in 1984 — before the increases announced for February 1, 1985.

The Minister of Transport in a recent published statement said Road User Charges will recover only about $139 million for the 1984/85 year (including the February 1, 1985 increases) of the $175 million allocated as the share of roading costs allocated to heavy vehicles.

If the level of Road User Charges collected remains at $87.6 million for the second half of the National Roads Boards financial year, there would be no need for the draconian increase on February 1, 1985, nor any further increase during the following year as "the $175 million allocated as the roading costs of heavy vehicles", will have been already reached or exceeded, as reported in the supplement to the New Zealand Gazette mentioned above.

It should be noted in the 1983/84 National Roads Boards statement that only $96,599,947 went into New Zealand's roads through the National Roads Board. The $96,599,947 is the amount from Road User Charges less the collection expenses. This means that only 44.1% of the total tax take from all heavy commercial vehicles went into roading.

Total tax take from all road users

The total tax take from all New Zealand road users for the year ending March 31, 1983 was $866.1 million an increase of 18.5 percent from the previous year.

Of the $866.1 million, $608.4 million was diverted to the Government's Consolidated Account for the year ending March 31, 1983, and only $233.0 went to the National Roads Board.

Distribution of the total road tax take

Year Ended 31 March	Total Tax Take (100%)	Diverted to Consolidated Fund	Allocated to National Roads Board
	$M	$M	$M
1983	866.1	608.4 (70.2%)	233.0 (26.9%)
1982	730.6	416.2 (68.2%)	211.1 (28.9%)
1981	626.1	416.6 (66.5%)	188.6 (30.1%)
1980	566.0	406.0 (71.73%)	138.7 (24.5%)
1970	160.2	80.4 (50.2%)	78.9 (49.3%)
1960	79.4	36.9 (46.5%)	41.6 (52.4%)
1955	49.4	16.7 (33.8%)	32.1 (65.0%)

Source: 1984 Motor Industry Year Book — attached.

Rod keeps costs down metres up,

Faster hard rock penetration, ease of handling and cheaper costs per drill meter are claimed for an extension rod with an integral coupling sleeve, manufactured by Oy Airam Kometa of Finland.

The Kometa MF-rod and its fixed coupling unit, has now been in use for two years in standard Finnish and Swedish mines. Other mines and large construction sites in the USA, Canada, Norway and Spain have also used the product. The company field-tested the rod for two years prior to the launch.

The makers now say that the costs per drill meter have been cut by three to six percent due to improved efficiency. Through ease of handling, production per shift has increased by 10 percent.

According to Airam Kometa, the all-in-one design of the rod and threaded sleeve gives a lighter and more easy to use tool than conventional models.

The risk of a separate sleeve becoming jammed in the wrong end of a rod is eliminated. The MF-rod is especially suited to mechanisation of the rod changing process.

Kometa rock drills are market leaders in Finland. Over 50 percent of the USD seven million turnover last year came from exports to Scandinavia, the USSR, Europe, South America and the Far East.

For more information: Oy Airam Kometa Ab, KOMETA, PO Box 6, SF-00751 Helsinki 75, FINLAND Telephone: 358-0369 21 Telex: 124298 kometa sf

Total tax take from heavy commercial vehicles — year ending March 31, 1984

			$ Million
Road User Charges			104.1
Sales Tax: Tyres	$M	7.4	
New Vehicles		14.1	
Spare Parts		14.1	
Trailers and Truck Bodies		3.0	
Diesel Fuel		41.0	
Total Sales Tax			79.6
Registration Fees (Excluding ACC Levies)			3.9
Customs Duty			21.5
Long Distance Permit Fees			10.0

Total Tax Take from Heavy Commercial Vehicles $219.1 million

As can be seen in the above table, the amount of taxes generated by road use diverted to the Government's Consolidated Account has steadily **increased** form 33.8 percent during the first year of the National Roads Board, to the present level of 70.2 percent. The amount of these taxes returned to our roading network has **decreased** from 65 percent to 26 percent over the same period.

You should also note that the estimate of the new Fringe Benefit taxes proposed by the Government in the Budget could reach $150 million from the use of motor vehicles. None of this $150 million will be dedicated to roading. Yet another case of road users becoming targeted tax revenue suppliers, discrimenately.

New Boomer for drilling in tunnels

Atlas Copco's new Boomer H127 drill rig is designed for flexible and high capacity drilling in small and medium sized tunnels and drifts.

It is a rubber-tyred, articulated rig featuring outstanding manoeuvrability in narrow headings, fast, flexible and accurate feed positioning, exceptionally tough construction and trouble-free maintenance.

Much of the rig's remarkable manoeuvrability is provided by its compact, articulated DC 15 carrier.

The Boomer H127 has an overall length of 10.5 m (when equipped with feeds for 12 foot drill steels) and has an extremely tight turning radius, 3m (inner) and 5.1 m (outer).

The rig is equipped with two of the new BUT 25 direct positioning booms. Each of these is controlled by a single joy-stick. Their straight-line motion between drill hole locations enables great savings in total positioning time per round. The booms are also capable of straight-line positioning for drilling roof or cross cut holes. In all modes parallel holding and excellent operator visibility are assured. The 1.25 m boom extension makes it possible to drill two rows of roof holes from the same set-up.

The rig's strong, rigid frame and booms are designed to eliminate the risk of damage from overloading. All the boom joints are equipped with the expanding shaft system (unique to Atlas Copco). This, combined with the rig's simple, direct controlled, hydraulic system makes the Boomer H127 exceptionally easy to service and maintain.

With compliments of Atlas Copco (NZ) Ltd. Released by Rex Monigatti, phone 720-307, Wellington.

The Boomer H127, suitable for drilling sections up to 7.4 m (w) x 5 m (h).

Atlas Copco contact: Gil Brandeis, Atlas Copco (NZ) Ltd, Private Bag, Lower Hutt. Phone 686-049.

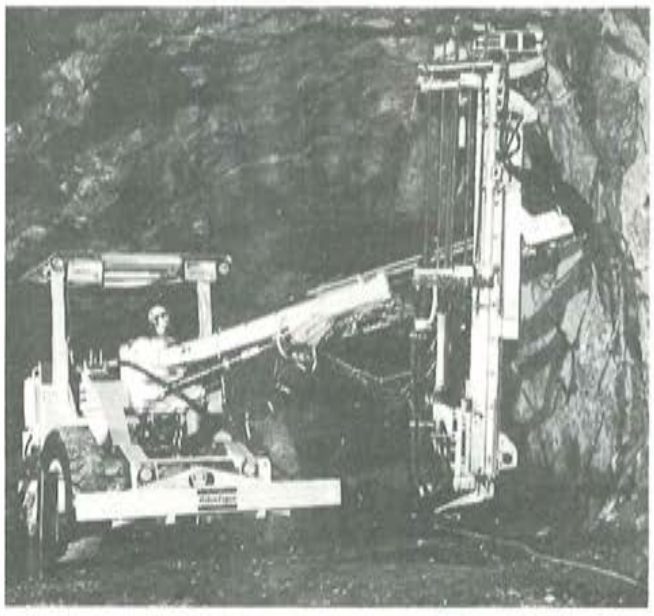
Mechanised Bolting Rig

Manual drilling and insertion of rock bolts has always been a hard, dirty and hazardous job. Rock fall during drilling is the main danger, but injuries from hand-held tools, from cement splashes and from falls from platforms (which often have to be used) have become more and more common. For these reasons several efforts have been made to mechanise rock bolting.

A highly successful example of this is the Atlas Copco Boltec H327. This is a light, fully mechanised, diesel-hydraulic, rig, suitable for setting resin and cement grouted bolts, mechanical bolts or friction bolts of any type, including Swellex. It has a carrying capacity of 10 bolts (one ready-mounted in the bolting unit's feed plus nine in the rig's magazine). The rig is mounted on a rubber-tyred, articulated carrier with a Deutz 55 kW engine.

The principal component of the rig is the RBC bolting unit mounted at the end of a rigid, fast-positioning BUT 35 boom. This has several design advantages: It is light because it incorporates only one feed. The top of the turret is small, which means that bolts can be set in difficult positions, for example, close to corners etc. The low weight and minimal movement of parts during mode shifts between drilling, injection and insertion contribute to greater precision and increased capacity. The rock drill is in full sight of the operator, thus providing an enourmous visibility advantage over other mechanised bolting equipment on the market.

When operating with the COP 1028HD or the COP 1032HD rock drills in hard rock conditions, a setting capacity of 12 to 18 bolts an hour is easily attainable. In soft rock, using the rotary COP 832R rock drill, this can be raised to 15 to 30 bolts an hour.



The Boltec H327 set up for drilling.

A ROC 401A-00, equipped with a COP 131 EB top hammer and a portable XAS 350 compressor.

Pipe it: or go down for it!

The quantum growth of horticulture in New Zealand has shifted enterprises up and out — away from low-lying areas with easy access to water, to more difficult terrain. The climate would be right in terms of the temperature range and prevailing winds. But rainfall can't be planned, or even relied on. Pumping systems are the answer in conjunction with a drilled borehole.

Davies Pumps of Penrose have responded to and anticipated the needs of farmers, horticulturists and country householders for more than fifty years. Their pumps have driven irrigation systems in forests and on farms, engine cooling systems in power stations, ships and boats — 80 percent of their business is in New Zealand but their equipment is well-known in Australia, Fiji, Tonga, Papua New Guinea, Singapore, Malaysia and the Philippines.

Their pump range, partnered by a parallel variety of valves, has built an enviable reputation for reliability and cost-effectiveness. In Australia a very satisfactory promotional device is to give a cash reward to anyone who can submit a valve with a manufacturing fault and they're able to say that with 8,000 units out in the field only one has failed.

But the expanding needs of horticulture put pressure on Davies to look at equipment combinations to satisfy more complex needs. Their concern for maintaining quality levels has led them to one joint venture, and the taking over of two exclusive agencies, with the aim of being able to assemble a multi-stage system in-house with options for any number of situations.

They sought flexibility, reliability and cost-effectiveness.

An international partnership

First addition was the DPN range — vertical multistage centrifugal pumps with stainless steel shafts, impellers, diffusers and sleeves. The stainless steel work and part assembly is carried out in Holland by Duijvelaar Pompen of Alphen A/D Rijn. Motors and completion come from Davies at Penrose.

The progeny of this international partnership is a high pressure, low volume range of pumps with heads up to 240m (700ft) which typically would provide the first stage for farm reticulation or market garden.

The DPN series is available in seven models, all from two to twenty stages, capacities to 20m3/hour (80 gal/min) with suction heads to six metres and temperatures to 110 degs C. The pump wetends will adapt to existing electric motors of multistage pumps by other manufacturers.

Seals and shafts are common to all models and no special tooling is required to service them other than a crescent, punch, soft hammer and Allan key set.

The year 2000

Davies' marketing manager Roy Jarvie makes the point — quoting an MAF spokesman — that New Zealand isn't exporting fruit, but water with skin on in the form of kiwifruit, fijoa, passionfruit and pepino — "We are growing fruit away from the flatlands where low pressure pumps could cope, and going uphill."

"By the year 2000 growers will be looking for 700,000 ha of arable land and most of it will need irrigation. Less than 3,000 ha of horticultural land in New Zealand is currently being irrigated."

"Although Davies make more than 100 different pump models the diversity of the market needs made it uneconomic to manufacture everything ourselves, and this need is growing."

"With the need for quality product to guarantee stable supplies for overseas markets there is no escaping the need for irrigation."

"The availability of natural surface water in areas where crops best grow — like Keri Keri and Te Kuiti — is now so limited that growers have to negotiate with the authorities to go ahead with irrigation schemes because all the easy options have been taken up."

"Now you've got to pipe it in, or go down for it!"

The majority of Davies pumps were designed for farm use, driven by diesel engines or through a tractor PTO, pumping low-to-medium heads but satisfying most application needs. Immensely reliable — parts supply guaranteed for ten years from new — and with a life expectancy of 25 years at least, the Davies range did more than its job.

Quality of water was not a problem in that kind of situation: now with the medium affected by aeration or high iron content, and the need to batch-treat water from the reservoir before application, or to add fertiliser in precise dosages, pump and valve systems need greater flexibility.

Davies Red Jacket submersible pump — tough and corrosion-resistant — designed to 'go after water' with a vengeance.

In the late 1970s Davies recognised that a distribution network was less satisfactory than a stronger dealer arrangement. And that's the way they have gone, with training packages for dealer personnel which includes an examination-based certificate of competence.

Widening the range

Davies have sold Red Jacket submersible borehole pumps, as exclsive agents, since 1980. They have ten models for 100mm and 150mm bores, able to pump from 0.4 to 15 litres/sec.

Now further needs are identified and served with a new range of submersibles from Hitachi group pump specialist Shin Meiwa of Japan, able to move additional materials as well as water, designed to shift sewage and liquid industrial waste.

The new Shin Meiwa series pumps are due here in July. And though initial applications are anticipated to be lifting water from rivers and streams where flooding is a problem and to link in combination for complex irrigation systems a very large market can be accessed in the medium term.

Unique feature on the Shin Meiwa range is a self-connection mechanism: when the pump is dropped in line with the guide pipe it is connected to the emission pipe with the connector automatically, and can be hoisted out also without 'hands-on' involvement so tanks do not have to be emptied for the purpose. Non-clogging type impeller provides the sludge shift capability.

The SP series has not needed to change style for many years — it's still quoted as the best self-priming pump on the market with a host of applications from swimming pool maintenance to country house supply.

NOTICE OF 1985 NZDF CONFERENCE

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Geothermal Policy Paper

Reports on 51 submissions concerning a new draft geothermal policy for 11 North Island geothermal fields are expected to go to Government Ministers in the next six weeks, the Minister of Energy, Mr Tizard, said today.

Mr Tizard said he expects the report to Ministers, the public submissions and the final geothermal policy will be released to the public in two to three months.

Ministry of Works and Development, the Tourist and Publicity Department, the Commission for the Environment, Lands and Survey Department, DSIR, the Treasury, and the Ministry of Energy.

A wide range of geothermal user groups, interest groups, and local and central government bodies had presented submissions.

Another try for East Cape Oil

Oil exploration is about to return to the greater Gisborne area after a 13 year absence.

The Minister of Energy, Mr Tizard, today informed the Member for Gisborne, Mr Allan Wallbank, that the Rere 1 exploration well is to be drilled about 50 kilometres West North West of Gisborne, in licence area PPL 38082.

The well will be drilled by Petrocorp Exploration Ltd., and is expected to start in late May. It is expected to take about 10 weeks to reach the anticipated total depth of 4950 metres.

Mr Tizard said the drilling of Rere 1 would be the outcome of an intensive helicopter-supported seismic programme by Petrocorp, which concluded last year.

This had enabled Petrocorp to narrow down the most likely formations. Previous wells had been disappointments, he said, but Rere 1 showed "reason for optimism", because the seismic programme had defined a large structure with hydrocarbon-bearing potential.

This would be the first seismically-defined structure to be drilled in the East Cape area since oil exploration began there in 1874. Oil seeps have been observed in that region for many decades and more than 30 wells have been drilled, the last being in 1972.

The total cost of drilling the well is expected to be almost $10 million, of which the Government's share, through the Energy Vote, will be about $4 million. Petrocorp is itself responsible for funding the balance, using its own resources.

The rig doing the well, Parker 160 is being brought from Taranaki for Rere 1. It is scheduled to drill only Rere 1 although this could depend on the results obtained.

Multi Purpose Engines from Japan

Yamaha's most powerful multi-purpose petrol engine is this 10hp model.

A new range of multi-purpose engines rated between 3.5hp and 10hp is being introduced to the New Zealand market.

The engines are all four-stroke, side valve, air-cooled units designed for a wide variety of uses in farming and industrial applications, including powering compressors, pumps, winches, conveyors, agricultural machinery or construction site equipment.

Within the range some options are available such as direct drive or 2:1 reduction drive, and electric start. An oil level warning system is standard on most models.

Four engine sizes are available:

Model MF150 – 145cc, max 3.5hp, weight 16.5kg, retail price $439.
Model MF180 – 179cc, max 5hp, direct drive model $438, reduction drive model $493
Model MF260 – 256cc, max 7hp, direct drive $600 reduction drive $688.
Model MF410 – 412cc, max 10hp, direct drive $732, direct drive/electric start $864, reduction drive $721, reduction/electric $878.

Dealership for these engines and other equipment in the Yamaha Power Products range (generators, submersible pumps etc) are still available in some areas of New Zealand.

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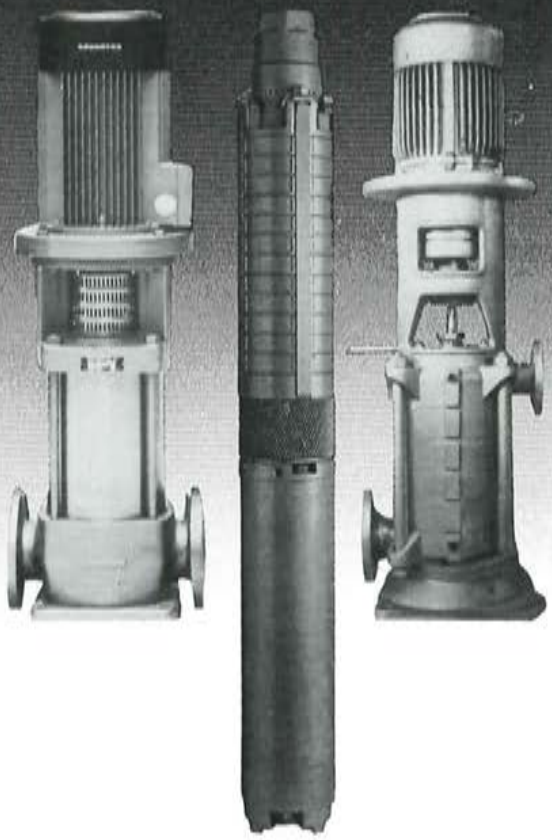

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