New Zealand

THE DRILLER

OFFICIAL PUBLICATION OF THE NZ DRILLERS' FEDERATION, SUMMER 1982-83, No 6

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Council table

Training visit in February?

A MEMBER of the Australian drilling training unit may visit New Zealand in February to examine the feasibility of running the unit's 15-module basic drilling course here.

The unit is prepared to conduct courses overseas, it told the council of the New Zealand Drillers Federation in a letter received at the November meeting.

It was hoped to arrange the visit to maintain momentum toward the development of formal training for drillers.

Moves to establish an apprenticeship scheme would be considered in greater detail with the Australian representative, and officials from the Ministry of Works and Development, the Department of Scientific and Industrial Research, the Ministry of Energy and Petrocorp.

The council meeting spent a lot of time considering how best the industry's need could be met by New Zealand resources and trainers.

Smoking over pipe

THE QUALITY of New Zealand Steel's 100mm heavy grade steel pipe is once again under scrutiny.

And the New Zealand Drillers Federation council wants members' co-operation in building up a fully-documented submission concerning the long-standing problem.

Councillors at the November meeting complained about the many 'banana' lengths in master bundles.

It was agreed that in future all faulty pipe should be returned to the merchants for credit, and that the federation secretary should be advised of details of the occurrence.

Next issue

The Autumn 1983 edition of the New Zealand Driller will be published on May 1 1983.

Advertising material for this issue should be in the hands of

The Advertising Manager
The NZ Driller
P O Box 245
WELLINGTON
Ph (04) 729 924

by April 1, 1983.

The deadline for editorial submissions, including new product and services information, is also April, 1983.

Conference resolutions

THE COUNCIL talked about how best to implement decisions taken by the Drillers Federation conference, held in Nelson in July. Among the decisions

- It was decided that each issue of The New Zealand Driller should carry a synopsis of proceedings at council meetings. The conference wanted copies of minutes sent to all members.
- A request for the federation to organise one-day seminars with guest speakers from overseas was noted, and efforts will be made to arrange these when and where possible.
- The present constitution means a request for an employee member to be added to the council cannot be met. Councillors also wondered whether any employee would be willing to stand the cost of airfares and loss of time involved in attending meetings. The costs are not reimbursed.

Once over lightly

THE MEETING also canvassed a number of other topics incuding

1983 Conference

Organiser Mr Ewen Cameron has booked the Willow Park Motor Hotel, Tauranga, from July 27-30. He is hopeful of being able to maintain the high standards set by previous conferences. Mr Woody Woodford and his assistants were thanked for their efforts at the highly successful 1982 Nelson conference.

The NZ Driller

Members noted with satisfaction that the New Zealand Driller magazine is now well established, and sought an increase in the editorial content. The editor was asked to make more space available for company and personnel profiles.

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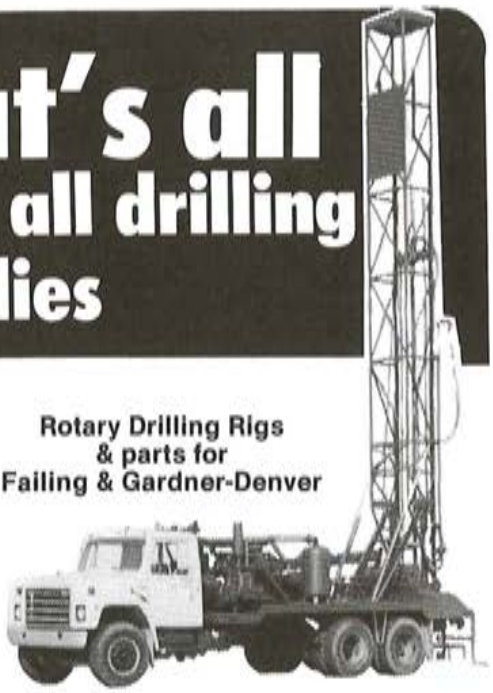

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Draft code

Favourable comment was made on the draft 'Code of good practice for well drilling', due for publication in 1983. The federation's congratulations were extended to the author, Dr H.R. Thorpe, and the co-authors, one of who is a well known drilling personality, Mr Russell Harris, of A.M. Bisley & Co Ltd, Christchurch.

Publicity

A directory of New Zealand Drillers' Federation members was published in an irrigation supplement produced by Straight Furrow, Federated Farmers' official publication. This was done after the council considered advertising "once or twice a year" in a well known farming journal as a way of publicising the industry.

Standard contracts

The questions of a standard contract form was hotly debated. South Islanders strongly support a federation-sponsored document, while North Island members just as strongly believe that their client relationships had no need for such a' document. The president, Mr Hamish Pearson, closed the topic by suggesting members adamantly supporting the document should take legal advice on drafting a form for their own company's use.

Drill '82 no bore

OVER 200 delegates from Australia and southeast Asia attended Drill '82, the first annual conference of Australia's National Waterwell and Drilling Association.

The NWDA was informed with the merger last year of the National Water Well Association and the Australian Drilling Association.

The key speaker at Drill '82 was Sir Lawrence Brodie-Hall, chairman and director of several Australian mining companies, including Western Mining Corporation and Central Norseman Gold.

Technical papers covered topics including 'Application of mineral drilling techniques in oil exploration,' 'Large diameter core drilling at Lady Loretta', and 'Bulk sampling by large diameter coring'.

Other topics discussed included mineral drilling at the Worsley alumina project, and the variety of special drilling operations used at the Collie coalfields.

The NWDA's executive secretary, Mr John Mills, said the conference and its associated exhibition demonstrated the high standard of drilling technology used in Australia.

The event was of a high standard, and Mr Mills is confident that Drill '83, to be held at an as yet undecided venue in Queensland, will be even more successful.

New rig for Petrocorp

A LAND-BASED drilling rig has arrived from Australia for use in the ambitious oil search programme started by Petrocorp.

It will drill wells in difficult east Taranaki terrain, testing a number of shallow structures similar to the McKee oil field now coming into production.

A list of scheduled Petrocorp activities was released by the Minister of Energy, Mr Bill Birch, who said the company is budgetting $300 million for "an unprecedented programme of oil and gas exploration".

Other onshore developments include the start of a seismic survey covering some 200 square kilometres east of Hokitika, begun as a follow up to past West Coast activities.

More seismic work is expected to start in Taranaki in April.

The Australian rig will start in early February, drilling a well to be known as Tauteka 1. It will then move north of the McKee field to test other promising structures.

Offshore developments include the expected arrival of the rig Benreoch from South Korea, to work off Taranaki.

Hunt Petroleum's Penrod 78 rig is due to arrive later this year to work in the Great South Basin.

More control on wells in Hawkes Bay

A BYLAW that came in to force on November 1, 1982, gives the Hawkes Bay Catchment Board and Regional Water Board stringent powers to control water bores, drilling, pile driving and dredging.

Any person making or altering a bore anywhere in the board's district — which extends from south of Takapau to north of the Mahia Peninsula — must now have a permit for the work.

The permit can be subject to any conditions which the authority thinks fit, or may be declined.

People granted permits will have to disclose information including the name of the driller, the date and method of drilling, and technical information about the hole including strata encountered, static head level, depth, casing details, water flow, maximum drawdown, and other information.

Other provisions in the bylaw can require the bore to be made available for inspection by the board, kept in good condition, and to be fitted with measuring or recording apparatus necessary to provide information the board may require.

Unused bores must be sealed to prevent the loss of water from any level.

The controls over drilling, pile driving, dredging or excavation activities more than five metres below the surface applies only on the Heretaunga Plains.

It wants 14 days notice of such work, and "if it appears to the authority that such work could affect the supply or purity of underground water it may, by notice to the person proposing to carry out the work, either prohibit the carrying out of work or permit the work subject to such conditions as the authority thinks fit".

Offendors against the bylaw shall be liable, on conviction, to a fine of up to $100, with a further fine not exceeding $10 a day for any day on which the offence has continued.

Full copies of the bylaws are available from

The Secretary
Hawkes Bay Catchment Board
P O Box 233
NAPIER

Drought area wants co-operation

PEOPLE ILLEGALLY taking water are causing problems in the drought-struck region covered by the North Canterbury Catchment Board and Regional Water Board.

And that authority wants the co-operation of the New Zealand Drillers Federation, and its members,

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in complying with legal requirements.

Resource planning manager Mr R.W. Cathcart said the steady drop in groundwater levels and stream flows is resulting in increased more complaints about domestic and stock-water supplies being affected.

Investigations have showed some complaints to result from the water resource being influenced by water users acting unlawfully.

Some are taking more water than they are entitled to, some have not reapplied for expired water rights, and still others have no rights to take the water.

The board introduced a groundwater bylaw in 1978, and since then anybody wanting to sink a bore or well has had to get a board permit. The system allows the board to control and protect the very important groundwater resources in the region.

"All bores or wells, regardless of the intended use of the water, require well permits under the groundwater bylaw.

"Unless the board has a complete record of all water uses, both those operating under statutory rights and those holding current water rights, it is unable to ensure all users receive their fair share.

"We seek the assistance of your organisation and members in complying with the board's requirements, so enabling the board to fairly allocate water amongst the various users. When any doubt exists water users should check with the board to ensure their use is recorded," Mr Cathart said.

- The North Canterbury Catchment Board and Regional Water Board covers Canterbury province, from the Rakaia River in the south to the Waiau River in the north, and from the Southern Alps in the west, to the east coast.

Big marine drill calls on Wellington

ONE OF the world's most technologically advanced pieces of drilling equipment called into Welington in January.

The Glomar Challenger was in port between drilling off the east coast of the South Island, and setting off for another assignment near Tonga.

A research vessel, its distinctive superstructure is dominated by a huge drill mast towering over the deck, reaching almost as high as the tower cranes working on Wellington's multi-storey office projects.

Working off the Canterbury coast, it uncovered evidence that the Southern Alps began forming about six million years ago, and the rate of growth has increased in the last two million years.

Other information recovered during the current expedition adds weight to theories that the entire rim of the Pacific Ocean has experienced large pulses of volcanic activity in the past.

Many volcanic ash layers were found in core samples – some weighing as much as 20 tonnes – recovered from over 3 700 metres (over 12 000 feet) below the sea floor.

The Glomar Challenger is financed by a scheme involving the US, France, Japan and West Germany, and undertakes six two-month expeditions every year, to work on projects approved by a committee of scientists.

The drilling operations manager on the ship is Mr Glen Foss, aboard for nearly nine years. From Illinois, he is the only driller on the ship not from Texas.

He says the job offers more satisfaction than drilling for oil, and his 15-man drill crew, which works 12-hour shifts, can take a real interest in what the drill brings up from as far as 7 000 metres below the surface of the sea.

Mr Foss spent 15 years drilling gas wells and time studying geology before taking his present job.

Land drilling has its hazards but men working at sea must stay continually alert.

Mr Foss said a man was once 'nailed' to the deck after a piece of steel broke loose from the 40-metre-high mast.

"The sort of man who becomes a driller works hard or he doesn't stay. He has to be physically rigorous. He has to have a better than average

Easier ground

mechanical ability and has to be alert at all times because it's dangerous."

- The scientist leading the Glomar Challenger's latest voyage is a New Zealander. Professor James Kennett, now of the University of Rhode Island, was educated at Victoria University and is a world authority on marine geology.

IR franchise sorted out

INGERSOLL RAND drilling equipment formerly sold by Dalhoff & King is now handled by Auckland-based Schlage NZ Ltd.

Arrangements for the franchise transfer were completed about mid-October 1982.

D & K, formerly one of the largest construction and agricultural equipment dealers in New Zealand with significant interests in drilling through the IR connection, was placed in receivership last June.

Schlage, a name best associated with locks, is a wholly-owned subsidiary of IR.

Products it formerly handled included air compressors of less than 100cfm output, air-powered hand tools, and other small equipment. It has sold several rotary screw compressors since the changeover.

D & K's share of the IR range covered drilling rigs, rock drills, compressors of more than 100cfm output, and compaction equipment.

Schlage has sales representatives in Auckland, Rotorua, Wellington, Christchurch and Dunedin. Most of the business will be handled through the Auckland head office.

Specialist problems and projects will be handled through contact with IR experts in Australia or the US.

"There's a few doors open to us because we're a wholly owned subsidiary," said a spokesman.

SSI crosses the Tasman

THE LARGEST general drillers' supplier in Australia has made a New Zealand connection.

Seismic Supply International and New Plymouth-based Drilling Services and Supplies Ltd formed a joint venture company to service the seismic, water well drilling and exploration industries here.

SSI was established 27 years ago. Its 12 Australian outlets are augmented by a southeast Asian operation, based in Singapore since 1968.

A statement says its experience, coupled with Australian stock holdings of $A5 million, means the company is well placed to service New Zealand.

"Seismic Supply places great importance on the New Zealand market, particularly in the energy related fields, and it intends to stock a representative range of most of its products through its venture in the New Plymouth location."

Principal agencies cover rotary drilling rigs, lightweight portable rigs, a complete range of downhole tools, geological supplies, geophysical instruments and data acquisition systems. These include

Smith Gruner, Walker Macdonald, Rockmaster, Hutchinson Bag Corp, Petrochem Inc, Barber Industries, Ardco, George E. Failing, King Oil Tools, Huddy Diamond, Acker Drill Co, Hacker Pyramid, Flame Industries, Humphrey Inc, Kay Rock Bit, Transequipment and Blue Streak Bit Co Ltd.

The New Zealand manager of Seismic Supply International will be Mr Peter Graham-Sutton, for several years a technical representative based in Adelaide. He will be supported by Drilling Suppliers and Services Ltd staff.

The 40-metre-high drilling gantry dominates the deck of the Glomar Challenger, berthed in Wellington in January. The ship, used for scientific exploration work, can bring 20-tonne core samples up from 7 000 metres below the waves

Russell Harris — nearly 40 years a driller

One of the highlights of 1983 in the drilling business is likely to be the publication of 'A Guide to Good Practice in Well Drilling.'

And one involved in the project has been Mr Russell Harris, South Island director of A.M. Bisley & Co Ltd.

Completion of that project will add another to the long list of contributions Mr Harris has made to the drilling industry in New Zealand in a career stretching back 38 years.

The New Zealand Driller looks back on that career.

In Saudi Arabia, Mr Harris (right) talks with Sheikh Al Matrood about an agricultural irrigation project. Mr Harris, a member of a New Zealand feasibility study team, recommended the installation of 450mm wells and submersible electric pumps. Bisleys later supplied both pumps and irrigation equipment

IN THE drilling business, there's only one place that anyone's allowed to start.

It's down at the bottom and masquerades under the almost important sounding title of 'driller's assistant', and it means anything from teaboy to book-keeper, with a lot of abuse in between.

But that's where Russell Harris began a life in drilling in 1945, after four years war service in the Navy.

He went to work for Brown & Sons, of Hamilton, then New Zealand's largest drilling contractors, and spent some of his first year working on a Failing rotary rig drilling grout holes in fractured greywacke on the site of the Karapiro hydro dam.

One of the advantages of working for a large company is that it operates a variety of equipment, and before leaving in 1949 after four years Mr Harris had experience with a lot of it.

After Karapiro, he worked with Tom Brown on a Star cable tool rig drilling 300mm air shaft wells into Glen Afton Collieries' mines, and so began a long association with tool operations.

Seeing an opportunity in the Waikato for someone to service the pumps used to supply water to increasingly productive farms, Mr Harris in 1950 formed his own water pump installation and servicing company.

The business picked up the contract for servicing all the pumps at 70 South Auckland Education Board schools. Other customers included turbine pumps up to 10 inch size for the Railways Department, sawmills and industry.

He also sold and installed some of the first electric submersible pumps used in the Waikato.

In 1951 he joined forces with another Hamilton company, Benton & Sons Ltd. The new firm, Benton & Harris Ltd, operated two rotary rigs specialising in farm and irrigation water wells, with the pump installation and service company supplying the equipment to work the wells.

In 1955 he had the opportunity to spend four months in the United States as a guest of Ed. E. Johnson Inc, of St Paul, seeing and experiencing many drilling operations. He worked with a New York company on reverse circulation water wells for public water supply, and in Kansas with a company operating Failing 1500 rotaries on water well work.

Back in New Zealand in 1956 Mr Harris went to work for A.M. Bisley Ltd in Christchurch, setting up its well drilling operation with a single cable tool rig working on irrigation wells.

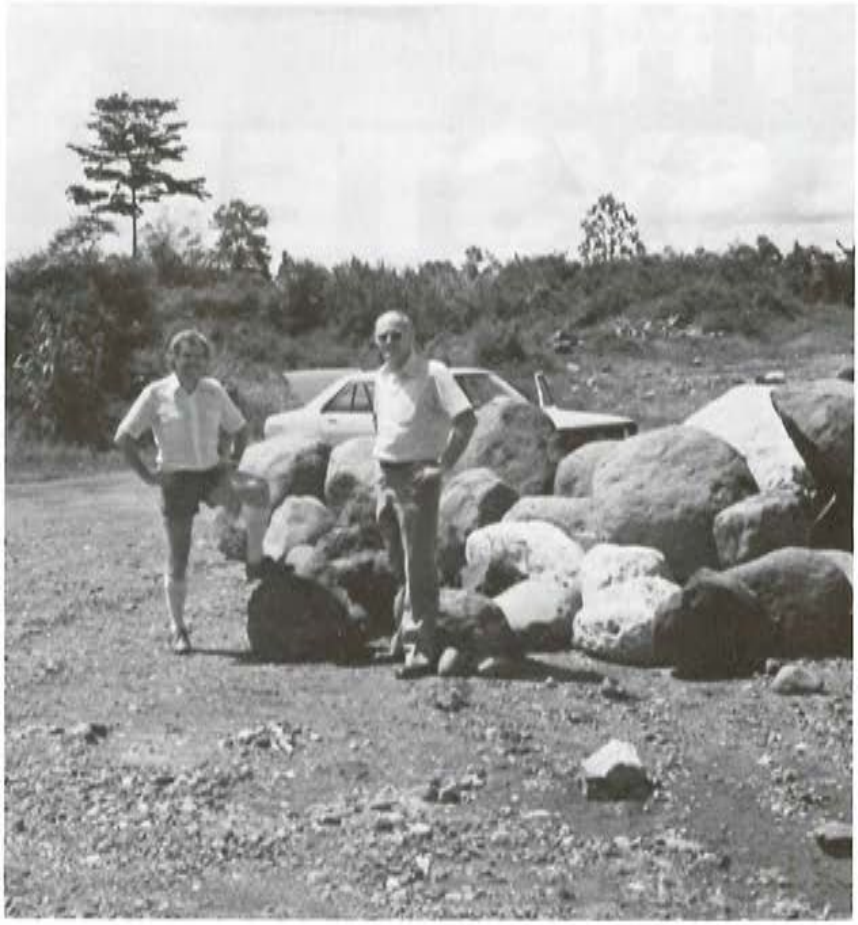
The business expanded rapidly into municipal and industrial wells, with contracts carried out for Dunedin and Christchurch city councils, the Waimairi County Council, and in Blenheim. One of the largest projects involved drilling three 24 inch wells in development of the Taieri wellfield, south of Dunedin.

Many of the wells involved using different techniques to overcome particular challenges and difficulties.

Nearly all were screened using continuous spiral slot well screens, set up to nearly 200 metres below ground level using the pull-back method. He also had experience with screening multiple aquifers, gravel packing uniform fine materials, and laminated non-homogenous aquifers.

Bisleys also pioneered the use of welded well casing for municipal water supply wells, persuading engineers that welding was technically and economically bettern than screwed pipe.

Many wells were built with telescoped casing construction. Using this technique a large diameter casing is sunk partway down the bore to ac-



In Papua New Guinea, inspecting one of seven well sites for the city of Lae. The 600mm wells were cable tooled to 70-80 metres in heavy alluvial gravels, screened, developed and test pumped at 150 litres/second. Note the boulders in the area

commodate the optimum-sized pump, while a smaller diameter casing goes down the rest of the way.

Mr Harris was appointed manager of Bisley's Christchurch branch in 1958, and given responsibility for developing the South Island marketing structure, which now includes branches at Timaru and Invercargill and distributors in many smaller centres.

The company's well drilling and investigation activities continued to grow, and in 1961 Mr Harris became a director of Bisleys.

By 1964 it was operating four rigs and had extended into the North Island. Among numerous successful contracts were the drilling of 23 300mm wells in rock and gravel for the Matahina power project core trench contract, and the supply of screens and pumps for Palmerston North city test wells.

That year Mr Harris was nominated by Johnson to attend the World Health Organisation-sponsored Groundwater engineering course at the University of Minnesota. That was followed by a further training period with Johnson, onwell screen application, and water well design and construction, and a month with Pleuger in Hamburg, on the design, construction and application of electric submersible pumps.

Bisley's water supply division has, under Mr Harris's control, grown into a large national operation involved in all aspects of ground water engineering, irrigation, dewatering, municipal agricultural and industrial water supplies.

More recently it has also worked overseas, being involved in agricultural irrigation projects in Saudi Arabia, and major Asian Development Bank projects including wellfields at Lae and Madang in Papua New Guinea.

Mr Harris has made numerous overseas trips to keep abreast of developments and technical changes occurring in the international well drilling field.

He is confident that many exciting opportunities lie ahead in the future of water supply engineering in New Zealand.

Drilling quality affects investigation outcome

DRILLING AND sampling is the most important part of any soil investigation.

"Without the correct amount of care, subsequent testing and analyses may be meaningless," said Mr Lex Welham, an engineer with Tonkin & Taylor Ltd.

He was addressing the 1982 annual conference of the New Zealand Drillers' Federation on soil sampling and testing.

Mr Welham said a skilled driller, with a genuine feel for what is happening at the bottom of the borehole, is essential when using present field investigation techniques.

And while further refinements in drilling procedures and equipment may ease the difficulties of drilling through some materials, it will increase the need for skilled and competent rig operators.

"The geotechnical profession realises the need for continuing training of drilling staff, and greatly appreciates the work of the New Zealand Drillers Federation."

The field investigation stage has the most important effect on the quality and relevance of final recommendations arising from an investigation programme.

"Extensive laboratory testing programmes and design analyses may all be in vain if a potentially weak zone goes unnoticed or unrecorded during the drilling and logging operation.

"An accurate description of the materials encountered and their locations is essential to the establishment of a relevant sampling, testing and analytical programme, and requires a skilled driller and careful monitoring of drilling progress and associated equipment."

Engineers require samples in a disturbed or undisturbed form.

In a disturbed sample, which can be taken with augers, driven thick-walled tubes, or bulk samples from pits, all the constituents of the materials should be present in the correct proportions. But the disturbance is

Continued on P14

New winches light, safe

A NEW series of air-powered winches are very compact and light in relation to their capacity.

Weighing from 45-680kg, they have load capacities from 500-3 600kg, and maximum pulling power of 5 300kp at 6.3 bar working pressure.

The design placed high priority on safety; standard features include a fail-safe automatic brake which activates instantly if air pressure should suddenly drop, easy conversion for remote control, and the brake is always engaged when the control lever is in neutral.

The A32 winch is intended for demanding working requirements. The 3.2 tonne winch has a rope capacity of 1 060 metres of 16mm rope with a working speed of 10 metres/minute. The rope lock is located outside the flange, a feature which enables easy inspection at any time. Information from

Atlas Copco NZ Ltd
Private Bag
LOWER HUTT
Ph (04) 686 049

Concentrated well cleaner

A CHEMICAL liquid concentrate specifically formulated for cleaning and developing existing and newly drilled water wells is now available.

Chemdex Industrial Chemicals' Asca 200 was developed and field-proven in the US.

It is a non-ionic surfactant which, when introduced to the well, rapidly disperses muds, fines and clays that would otherwise restrict the free flow of water through the well screen or from the surrounding aquifer.

As well as dispersing and releasing restrictive solids, the chemical's foaming action holds them in suspension so the well may be pumped clear after the appropriate cleaning period.

According to Chemdex, Asca 200 works rapidly to remove soft iron oxide, bacteria, and calcium and magnesium salts from the aquifer, well screens, drill casings, and pump components.

The well to be treated is dosed at the rate of 20 litres for every 30 metres of depth, irrespective of diameter or static water level. The concentrate is diluted with four parts of water, and poured in.

With a new well, the water is agitated from two to four hours by surging or swabbing. The well is then pumped out.

When rehabilitating an old well, the solution is normally left in the well for up to seven days before pumping.

Tests in Australia showed Asca 200 cuts development time on new wells, restores and frequently improves the original performance of existing wells, and ensures optimum pump efficiency under all operating conditions.

The product is non-toxic, non-corrosive, and non-inflammable. It can be used in conjunction with other well chemicals and, after use, is harmless to crops under irrigation. Information from

Chemdex Industrial Chemicals
P O Box 365
Pymble NSW 2073
AUSTRALIA

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Submersible pumps hard

A NEW electric submersible propellor pump is designed to pump very high water volumes against low heads.

The Pacific Frogman AB-4 can produce 750 litres/min, but can only deal with heads up to three metres.

The unit has a 0.4kW single or three-phase motor, a 100mm outlet, and weighs only 18kg. A feature is the durable silicon carbide mechanical seal system for maximum life and reliability. Information from

Pacific Pump Co
2 South St
Rydalmere NSW 2116
AUSTRALIA

Addition to water well drill range

YET ANOTHER rig for drilling water wells has been introduced by Atlas Copco.

The latest addition to Atlas Copco's water well drilling range is the Rotamec 50

The Rotomec 50 is a hydraulic rig designed for down-the-hole drilling with COP 42 or 62 hammers, the ODEX method and for rotary drilling in overburden.

The rig can be easily mounted on different kinds of carrier.

The standard version is powered direct from the carrier's pto, but a separate diesel engine is available as an alternative power source. A portable, high pressure rotary screw compressor can provide compressed air for flushing the drilling hole and powering the impact mechanism when drilling down-the-hole.

The unit's design is simple, yet robust, and service and maintenance is made easy by readily accessible components.

High drilling rates are ensured by the feed force of 29.3kN and lifting capacity of 48.3kN. The top-drive rotation unit has a hydraulic orbit motor powering the spindle at speeds range from 0-37rpm.

Rotation torque is 3 730Nm throughout the whole speed range. When equipped with dual rotation motors, the rig achieves a rotation speed of 0-19rpm on torque of 7 475Nm. Information from

Atlas Copco NZ Ltd
Private Bag
LOWER HUTT
Ph (04) 686 049

Pump guide reprinted

AUSTRALIAN PUMP manufacturers in 1982 published the fourth edition of the 'Guide to Australian Pumps'.

The guide, which has worldwide circulation, details pumps under three headings; pump type, applications, and materials, drives and allied products.

Other information covers APMA member companies, their product ranges, manufacturing facilities and branches. A short technical data section is also included.

Also available now is the fourth edition of the APMA publication 'Australian Pump Technical Handbook', designed to improve the technical expertise of pump designers and manufacturers. It also provides a valuable aid to users in selecting

Continued on P14

Rough conditions for welding . . . but those are the conditions in which Baylis Bros Ltd, of Hawkes Bay, require their welders to work. And it is a tribute to the electrodes, supplied by Weldwell, that no weld has ever failed, despite the abuse to which they are subject

Continued from P12

pumps and systems for small or large projects.

The guide costs $A12, while the handbook costs $A7.50. Post and packing is extra. Copies may be ordered from

The Secretary
APMA
P O Box 817
Canberra ACT 2601
AUSTRALIA

Arc welds get torture test

WATER, MUD, pounding, stretching, twisting.

Just some of the abuse tolerated by arc welds made by Hawkes Bay drillers Baylis Bros Ltd driving 25-30cm diameter pipes up to 20 metres into the ground.

The two-metre pipe lengths are welded just above ground level using Philips 56S low hydrogen arc welding electrodes, manufactured by Weldwell (NZ) Ltd.

Welding conditions are atrocious; the face is invariably splattered with mud, and often doused in water gurgling from the bore. Welding cables are usually submerged in muddy water.

But the Baylis team must nevertheless achieve good penetration, and totally reliable welds, otherwise the cost is high.

The welds first suffer pounding from the one-tonne drop hammer, and are then pulled from the earth by a rig exerting three tonnes of pressure. If a casing breaks below the surface, neither it nor the well can be retrieved, and the drillers have to move over and start again.

Apart from the lost material, the US-built rig costs $70/hour to run, with a well taking two days to excavate. Pipes stretch, split, curve and twist, but no weld made with a 56S electrode has ever failed.

"We've been using electrodes supplied by Weldwell for 20-odd years now. We've no reason for trying anything else," said managing director Mr Dick Baylis. Information from

Weldwell (NZ) Ltd
P O Box 749
NAPIER
Ph (070) 53 337

Crawler line grows

THE RANGE of top hammer hydraulic crawler drilling rigs offered by Atlas Copco was recently enlarged with introduction of the ROC 920HC, the heaviest percussive drilling rig it makes.

The rig's compact and robust characteristics make it ideal for quarry and opencast mine production drilling, and for tackling holes in the 25-125mm diameter range.

The 920HC is a development of the 820HC. It has a feed for six metre drill steels and this, combined with automatic rod handling equipment, means production can be increased as much as 10 per cent under certain conditions.

A standard XAS-series rotary screw compressor is mounted on the rig.

A COP 1038HB rock drill, with features including adjustable impact rate, impact energy and torque, is standard. An automatic anti-jamming device and built-in recoil dampening prevent the drill steel getting struck in the hole.

The silenced cab has all-round vision and controls for all functions, including the rod handling system. It is also heated and air conditioned.

A disposal system takes care of drill cuttings. Information from

Atlas Copco (NZ) Ltd
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such that laboratory test results would not truly reflect the material's insitu engineering properties.

Undisturbed samples, taken with tube, piston or foil samplers, preserve the natural structure of the material.

Mr Welham said undisturbed samples should be subject to considerable care in sealing, protecting and labelling for the journey to and from laboratory or storage.

Recognition of the many possibilities for the disturbance of a soil sample between sampling and testing has greatly increased the rate of development of insitu testing.

More recently, with advances in design analyses made possible by computers, the accuracy of measurement of soil properties has taken on new significance.

"Refinements to designs are quickly and easily analysed, and the importance of knowing the material properties as inputs to the analyses is now being realised. Consequently much research has been concentrated on the development of insitu tests which may be explained theoretically by recent developments in the understanding and mathematical modelling of soil behaviour," Mr Welham said.

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