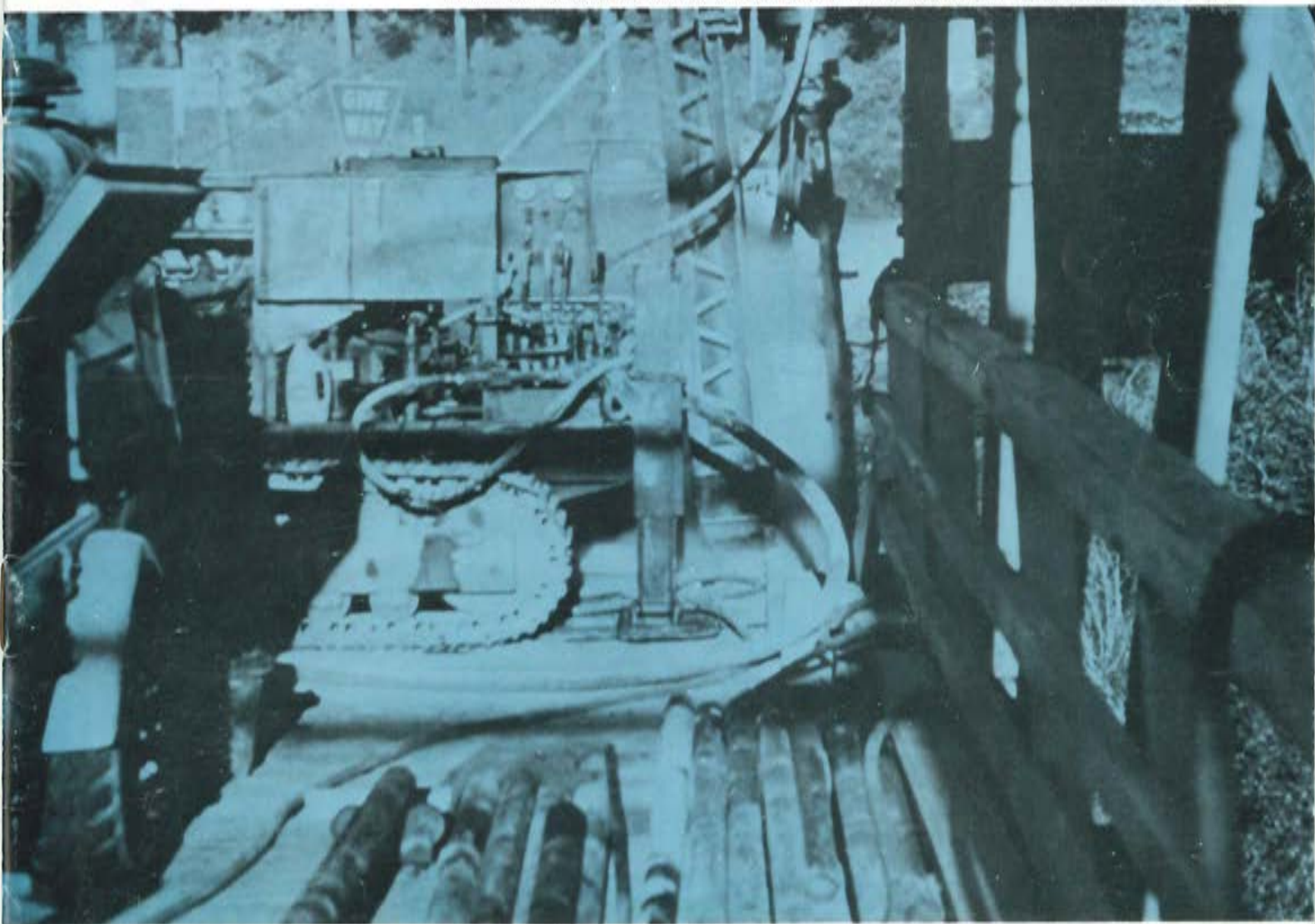




New Zealand **THE DRILLER**

OFFICIAL PUBLICATION OF THE NEW ZEALAND DRILLERS FEDERATION INC. No.1.



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Convention '81 in Wellington

THE DRILLERS Federation will hold its 1981 conference in Wellington from August 5-8.

The venue will be the Burma Motor Lodge, Johnsonville.

An opening function will be held on the evening of Wednesday, August 5, and the following days will be occupied by various speakers covering a wide range of topics associated with drilling.

The organiser, Mr Peter Lemmon, says that he hopes to include a more practical emphasis in the drilling school programme.

This is expected to mean field trips to the Wellington Regional Water Board's treatment station, Ministry of Works and Development laboratories, and inspection of any drilling projects being carried out in Wellington at the time of the conference.

Registration forms are expected to be distributed within the next few weeks.

Council looks at contracts

THE COUNCIL of the New Zealand Drillers' Federation is investigating the possibility of producing a standard form of contract that drillers could use in dealing with clients.

The issue was discussed at the committee's meeting in Wellington last month when standard contracts used by overseas organisations were discussed.

Preparation of the draft contract has been put in the hands of Mr Peter Lemmon who says that he intends to have the job completed before the next council meeting.

Providing that not too many major amendments are required, the standard contract could be available for circulation at the conference in Wellington in August.

Mr Lemmon said that the use of a simple standard contract would go a long way toward ending many of the misunderstandings that occur between drillers and their clients, particularly as regards the nature of

ctd on P4.

The New Zealand Driller

THE NEW ZEALAND DRILLER is a new publication sponsored by the New Zealand Drillers' Federation.

The decision to go ahead with its publication was taken late last year by the council of the federation with a number of aims in mind.

One of the most important is to provide a more formal channel of communication for members concerning the activities of the council of the federation, reporting regularly to members on information of vital concern to the industry.

Another important function of the magazine is to publish the views and activities of the federation to a wider audience, that particularly includes the catchment authorities and government departments with which members of the industry have to deal from day to day.

As well, its editorial coverage will extend to news of particular interest to drillers, including coverage of opportunities for future work, news of new investment decisions made by businesses in the industry and its suppliers, and on events in the wider world that could impact on this vital, but very low profile, part of the national economy.

Regular features will look at men in the business, discussing their experiences and the lessons they have learned over their years, various drilling projects that are unusual or distinctive for some reason, and regular information on new products and services that become available to drillers.

Perhaps one of the most important functions of the publication, in the long term, will be the publication of technical articles, supplied by our readers, or their suppliers, and garnered from a variety of international sources.

In this way does The New Zealand Driller aim to fulfil the three major functions of any publication — to entertain, to inform, and to educate.

It should be stressed that The New Zealand Driller is the industry's voice. Contributions from its readers, whether in the form of articles, letters to the editor, or just brief notes concerning some piece of news or event of note are not only welcomed... they are essential if the publication is to live up to the high expectations that we have for it.

The survival of a publication such as this is dependent on the level of support that it receives from advertisers... both suppliers and people in the industry.

If the advertising support is not forthcoming the publication, affected like everything else these days by the high cost of doing anything at all, will not survive and members of the federation will lose a most valuable channel of communication.

Advertising, for its information content alone, is an important part of any publication. This one cannot live without it.

If you require further information about The New Zealand Driller, or the New Zealand Drillers' Federation, contact either of the people listed below:

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The NZ Driller
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WELLINGTON
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Further information on editorial matters, advertising rates and other details are to be found on page 13.

OUR COVER: Drillers in operation... Lemmon Piling and Drilling at work in the Nelson district. Using an Atlas Copco COP4 down-the-hole hammer to drill vertical anchors through the piers of an existing bridge near Motueka, the company was able to meet the tight accuracy specifications demanded in the contract documents.

ctd from P3.

the work and materials that are included in any estimate or quotation. A standard contract would give the clients a written quotation that could be filled out when the driller inspects the job site and at that stage it could be explained to the client what is included in the price and what is not.

"It will hopefully eliminate many of the problems that go with verbal agreements.

"A lot of the business of this industry tends to be conducted over the phone. For instance, we'll get a phone call from someone who wants a site investigation done, we'll agree on an hourly rate and send the bore logs away with the account.

"Then we'll sit and watch the building go up or the project go ahead while we're still waiting for our money because there's nothing in writing about when we should get paid.

"It's all very much verbal and difficult to prove when the crunch comes."

Mr Lemmon said that the standard contract will consist of the best features of the Australian and US examples that the association federation has obtained, with some modifications and amendments to cover fully the situation in New Zealand.

Over 30 pass exams

THE LIST of people who passed the training school examinations held in conjunction with the New Zealand Drillers Federation's 1980 conference in Queenstown has recently been released.

The council of the federation has congratulated all those who were successful, and has noted that the list included several public sector drillers from the Ministry of Works and Development and the Department of Scientific and Industrial Research.

A total of 34 candidates were successful in the examinations and the top marks were obtained by Mr David Reid, of Jenkins and Associates, Invercargill.

A further drillers school will be held in Wellington in early August in conjunction with the 1981 federation conference. The list of successful candidates at Queenstown were:

David Reid, (Jenkins and Associates) Invercargill, 1; Russell Farquhar

(A.M. Bisley) Christchurch, 2; Kevin McCorkindale (MWD) Wairakei, 3; Earle Adams (Petrocorp) Wellington, 4; Tony Lawrence (Green & McCahill) Queenstown, 5; Ewen Cameron (Farm Maintenance) Tauranga, 6; Murray Carlyle (Carlyle Welldrilling) Te Puke, 7; Wayne Bradley (Waimea Drilling) Richmond, 8; Peter Ward (Rotorua Welldrilling) Rotorua, 9; Russell Harris (A.M. Bisley) Christchurch, 10.

John Johnstone (DSIR) Lower Hutt; John Hill (Hill Welldrilling) Hastings; Neil Richardson (Richardson's Drilling) Palmerston North; Alistair Taylor (McNeill Drilling) Invercargill; Doug Chase (Petrocorp) New Plymouth; Jim Gupwell (MWD) Cromwell; Ritchie Murray (MWD) Turangi; Jeff Cowlin (Washington Drilling) Timaru; Dick Baylis (Baylis Bros) Napier; Joy Hill (Hill Welldrilling) Hastings.

Dave Watts (MWD) Dunedin; Ron Pilcher (McNeill Drilling) Invercargill; Peter Kent (McNeill Drilling) Invercargill; Iain Trusler (MWD) Cromwell; Lance Carlyle (Carlyle Welldrilling) Te Puke; Dave Burgess (Burgess Drilling) Dargaville; Dawson Murray (MWD) Dunedin; Steven Pilcher (Waimea Drilling) Richmond; John Ford (Ford Drilling) Leeston; Lois Cameron (Farm Maintenance) Tauranga.

Ian Barron (McNeill Drilling) Invercargill; Evan Kitt (Washington Drilling) Timaru; Steve Koot (McConnell Dowell) New Plymouth; Shane Anderson (Carlyle Welldrilling) Te Puke.

Groundwater '81 in Malaysia

GROUNDWATER '81, an international conference and exhibition on soil investigation and groundwater for developing nations, will be held in Kuala Lumpur in June 1981.

The conference is being organised by the National Water Well Association of Australia and will look at many aspects of subsurface technology including

- Latest developments in geotechnology, covering groundwater and soil investigations,
- Latest developments in training and education in these fields, and
- The requirements of developing nations, including their needs of

equipment, technology and other aspects of such projects.

The major subject topics in the groundwater field include drilling, well and equipment design, corrosion mitigation and well development and groundwater management. Soils investigation papers will cover in-hole evaluations, coring and sampling, hydraulic testing and safety factors and margins in investigation programmes. The training and investigation sessions will cover aims, needs and techniques.

Information from

Groundwater '81
Box 142, Chatswood
New South Wales 2067
AUSTRALIA

NZers gear up Asean trip

MEMBERS OF the New Zealand Drillers' Federation are organising a tour party to attend the Groundwater '81 conference in Kuala Lumpur, Malaysia, in June.

It is envisaged that the group will be out of New Zealand for about three weeks, visiting other centres in the Asean countries as well as the conference.

The itinerary is expected, at this stage, to take in Singapore, Penang, Bangkok, and Hong Kong, as well as Kuala Lumpur.

Details of the Groundwater '81 conference appear in an adjacent article. The conference is expected to hold plenty of value for New Zealand drilling contractors, despite the fact that it is being slanted toward the problems of developing countries.

Contractors interested in attending the conference should contact

The Secretary
NZ Drillers' Federation
P O Box 1318
HAMILTON

Judge finds for driller

A CHARGE of operating a mobile pile driver-drilling rig when a distance recorder meter was not connected to the vehicle has been dismissed.

The prosecution was brought by the Ministry of Transport against the

Washington Drilling Co Ltd before Judge I. Hay in the Oamaru District Court in mid-1980.

The vehicle, which is domiciled in Timaru, was on its way to Weston, south of Oamaru, to conduct test drilling operations when it was stopped by a traffic officer. After discussions with the driver of the vehicle, and another back-up vehicle, the officer issued the offence notice.

According to the judge's decision, Washington Drilling denied that it had to maintain the hubodometer on the rig because the vehicle was a mobile pile driver which, in the Road User Charges Act, is required instead to have a time licence.

The vehicle was carrying a distance licence, but the managing director of the company "explained that in some respects this was carried in some confusion as to the requirements of the act at that time".

The prosecution argued that the vehicle did not come within the category of off-road vehicles and was therefore required to carry a distance recorder.

Describing the evidence of the traffic officer was "quite fair really" the judge said that the officer had admitted not knowing the exact distinction between a mobile pile driver

and a mobile drilling rig; although he believed it to be a drilling plant he was in a situation where he could not say that the vehicle was not a mobile pile driver.

"The driver described himself as a driller, and the company is known as Washington Drilling Co Ltd, and the vehicle was described in the register as a mobile pile driller," the judge said.

"But this is not the end of the matter.

"The managing director of the defendant company gave in evidence that about 80 per cent of the company's operations are involved with pile driving rather than well drilling... he assured us that this vehicle did and does pile driving work. He brought photographs to illustrate this.

"This vehicle is equipped with a large boom or mast which comes down over the vehicle when not being used, but when in use is vertical and used for pile driving operations and various kinds of well drilling work. There are photographs of these vehicles at different sites where work was being carried out for foundations of buildings, and also for other projects...

"... the only technical evidence as to the nature of this particular vehicle, of

course, came from Mr Washington, and he declared that the vehicle could be used and was used for pile driving. Miss Thompson's (Washington's counsel) argument was that if this was... really intended now as a main use of the vehicle it should be classified as such.

"Unless the ministry can say that it is not a mobile pile driver I think the matter must be interpreted in favour of the defendant company.

"If the vehicle is capable of use as a mobile pile driver and is used as such, I feel that is quite enough from the defendant's point of view. I think in the circumstances I will have to dismiss the charge," Judge Hay said.

US technology impresses

DRILLING CONTRACTORS in the United States and New Zealand have a great affinity, according to the president of the New Zealand Drillers' Federation, Mr Gordon Brown.

He has recently returned from a month-long visit, to the US, including

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attendance at four major drillers' conferences and two exhibitions to the United States and Canada.

He made the trip with a party of 17 Australian drillers, and said that the hospitality offered by the Americans was fantastic.

"They seem interested in hearing about New Zealand and the sort of work that we do — perhaps more so than they were in the Australian business," Mr Brown said.

During the tour he attended National Water Well Drillers Association meetings in Ohio, British Columbia, and Toronto, as well as attending the association's major conference in Hartford, Connecticut.

The latter function drew over 2 500 delegates from all over North America and included a very large equipment exhibition and a competition between 10 different drilling rigs.

He was impressed by the availability of equipment — "There's a hell of a choice of equipment with up-to-date technology that we've never seen or heard of in New Zealand," Mr Brown said.

One of the highlights of the trip was a visit to the Ingersoll Rand manufacturing plant. The cost of the equipment being produced is rather daunting — a 500 metre capacity rig now costs around \$185 000.

At the Hughes Tool Company plant in Texas he was able to see in action new welding techniques for drilling applications. Hughes is the manufacturer of the Hughes Tricone drilling bits which are generally regarded as the 'Rolls Royces' of the drilling business.

The new welding techniques do not involve the use of welding rods or gases.

In friction welding, drill rods are held in a vice while the joints are rotated at around 2 500 rpm. The two components are brought into contact and the friction creates very high temperatures that allows the two pieces of metal to fuse within 15 seconds — making a connection that would take at least 30 minutes using traditional welding techniques.

Another new development is the use of beam welding which uses a beam of high intensity light, similar to a laser beam.

A tale of documents

While the NZ Drillers' Federation has been discussing the prospect of providing members with a standard form of contract, it received this document that, as drillers will know, is only vaguely dissimilar to most of the documents under which their work is controlled.

1. The plans and specifications are to be taken together. Anything shown on the plans and not mentioned in the specifications, and not shown on the plans, is to be considered as both shown and specified, and anything wanted by the engineer or any of his friends, or by anybody else (except the contractor) shall be considered as shown, specified, implied and required, and shall be provided by the contractor with expense to nobody except himself.

2. If the work has been done at no expense to the contractor, the work shall be taken down, dug up, or reworked and done again until the expense is satisfactory to the engineer.

3. Anything that is correct on the plans is to be considered correct and anything that is wrong on the plans is to be discovered by the contractor and shall be made good without telling the engineer or indicating it in the bills.

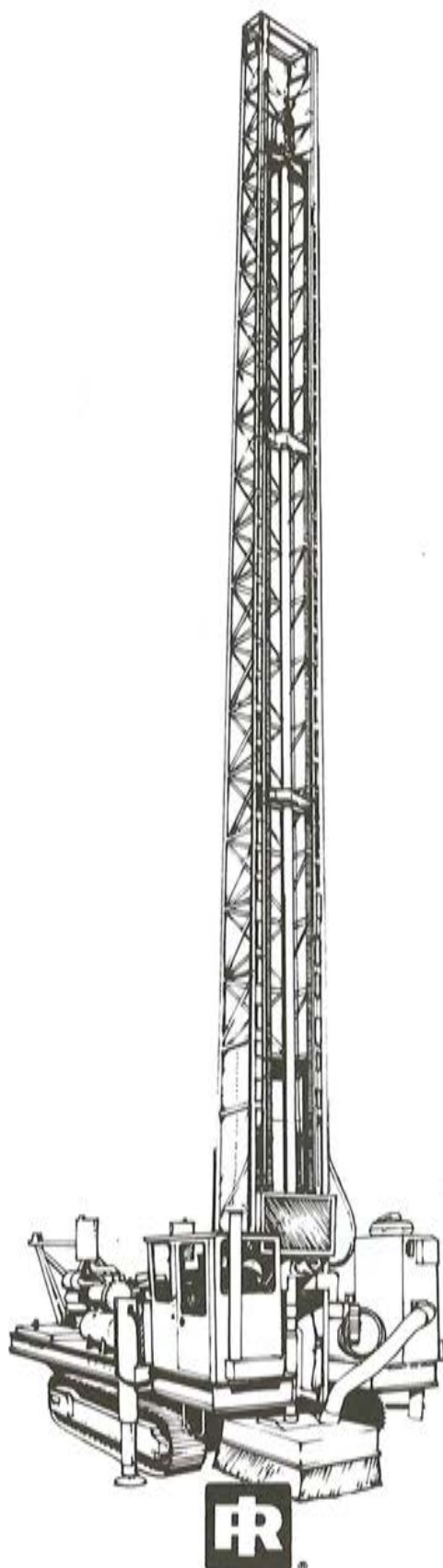
4. Anything that is forgotten or left out of the plans or specifications but which is necessary for the convenience of the guy who is the owner shall be provided without extra cost to anybody but the contractor. The engineer reserves the right to change his mind about what is best.

5. Any evidence of satisfaction on the contractor shall be considered just cause for withholding final payment, and the contractor shall have no recourse.

Downer takes big rig for Stockton

ONE OF the largest drilling rigs seen in New Zealand — outside the oil exploration arena — is now working at the Stockton opencast coal mine on the South Island's West Coast for Downer and Company Ltd.

The Ingersoll Rand Drillmaster DM35SPH, sold by Dalhoff and King Ltd, was commissioned in early Jan-



uary. It is drilling blast holes on the \$4.115 million contract for stripping two million cubic metres of overburden.

Much of the coal produced at the mine is destined for export markets.

The rig is specifically designed for operation in open cast mines, and is capable of drilling a 15mm diameter hole to nearly 20 metres deep in a single pass.

The drilling unit is a hydraulically-driven Kelly bar, but the machine also has the capability of using a down-the-hole hammer and is fitted with a 600cfm compressor.

The machine, including a variety of spare parts, cost Downers just under \$400 000.



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Every hole is different in Hawke's Bay as local driller finds



John Hill

ONE OF life's most interesting facets is that, as any experienced driller will happily tell anybody who happens to be listening, once you put the bit in the ground you can never be entirely certain of what is going to happen, or what you are going to find. In this article, John Hill, from Hill Well-drillers Ltd, Hastings, discusses just another ordinary job.

THE work involved drilling a standard 150mm production well for the Hawkes Bay Farmers Meat Co Ltd, at Hastings, using standard cable tools.

After an initial telephone conversation, when rates were confirmed and other matters discussed, the post produced regional water board permit No 1014, setting out the size of the well, its general location and specific use purposes.

On the site it was decided to bore on the edge of a two hectare pad of gravel fill, one metre thick. Works staff built a pit of heavy timbers to ground level, with two metres square clearance so that the bore could be finished off below the level of the fill.

The gravel pad had been originally placed because the area was very damp and low-lying, affected by adjacent springs. Open drains were able to effectively cope with drainage from stock holding paddocks.

As usual in this area, a minimum of nine metres of 200 mm API conductor case was driven as a stabilizer and to control possible leaks. This case was driven tight before cleaning with no shoe on the head to prevent oversizing. As a general criteria, we try to finish the conductor into at least two metres of good stiff pug. The log on the 200mm case from the fill top showed

- 1.2 to 7m blue muds very soft, with vegetation;
- 7 to 7.5m brown muds very soft, with vegetation;
- 7.5 to 9.5m blue muds, very soft with wood (tree roots);
- 9.5 to 11m blue muds firm with some blue gravel.

With 11 metres in and cleaned out, the thought was to flange the 200mm off and weld on a 50mm socket below the flange for a possible water or grout inlet.

A 150mm API case with a shoe welded on was run down to 11 metres and driving commenced. At 121.2m the 150mm case was in blue gravel which had a positive head of more than three metres. Water was between both 150mm and 200mm cases. Both cases were sealed off by a flexible pressure seal at all times.

The driller in charge decided to withdraw all of the 150mm case from the hole, cut off all of the fittings on the top of the 200mm case after a stopper had been inserted and weld on three metres extra 200mm casing then drive this on to isolate the water-bearing layer.

At this point, some drillers would ask, "Why bother to go on?" Read on.

This layer extended to 22.8m being very free in poor quality water. From 22.8m to 24.43m where the 200mm was bottomed was very sandy, smelly blue mud — not a very good seal but the best available. Again the 150mm case was run, and driving on produced the following log.

- 24.43m to 27.00 blue mud bands, blue sand bands;
- 27.00 to 28.4 blue gravel & sand, no water available;
- 28.4 to 29.5 brown muds & sand;
- 29.5 to 37.2 blue & brown gravels Head 7m + ;
- 37.2 to 40.3 blue silty muds, some sand bands.
- 40.3 plus, brown gravel & sand, very free, considered the main aquifer.
- Case stopped at 48.99m.

After driving and cleaning to 48.99m a check was made at the 50mm outlet on the 200mm case. Hell! Water and sand with a 7m head flowed! From here on we had a leak from up the outside of the 150mm case, probably caused by the shoe cutting through the poor sealing layer from 24.43m to 29.5m.

The well was screened with six metres of 2.5mm slot stainless steel wedgewire 'Surescreen'. Jacking back to expose the screen to the aquifer was very easy with only 18 tons required on the casing.

Development was by surging within the screens and bailing. It took approximately 20 hours to produce 1000gpm of free-flow, sand-free potable water.

The leak was of a type common in this area, but never with so much flow, or so deep a conductor pipe.

Why did we drive the 200mm conductor pipe on?

We had a leak of the main aquifer into the annulus between the 150mm and 200mm casings. If the 200mm had not been taken to 24.43m we still would have had a leaker, but it would have flowed into the first aquifer (+3m head) causing pressure in this layer, and the already existent in adjacent springs—(serious indeed at 1000gpm, free flow for 150mm or 1600gpm for 200mm).

While jacking was taking place, a weld coming through the flexible seal caused a tear with a resultant water leak of around 2 000gph. This flow was of no importance until development was finished and the 150mm casing was to be cut off and flanged at the final depth below ground level. Over 200 litres of grout was pumped into the annulus between the cases. After 24 hours the top flange and pressure seal were removed and replaced, the 150mm tee with valve on the horizontal leg attached and a blank plate attached to the top of the tee by one bolt.

The last chance of being wet was in sight. After two turns on the top screw of the stopper, it released and was lifted out of the hole (600lbs weight equalled water pressure). We then swung the blank flange over, tightened seven more bolts and the job was done, apart from the removal to the yard of the accumulated tooling. What was to have been one of the ordinary jobs turned out more extraordinary than we ever anticipated. It used about 50 per cent more materials, and 40 per cent more time. Thank heavens for a 'guestimate', and because of the problems we gained additional experience.

This bore will become a fire well after the new fellmongery is completed. Production water is to come from a new 200mm well—approved, passed

and permitted by the regional water board to be located only 20 metres away from the 150mm completed. Perhaps discussion with management will call for some alteration to plans. However, from having drilled many wells in this area I can be sure that the next well will still be somewhat different in the top 30m.

Every future well in this area will be a challenge to our ability to recognise and counteract intermovement from one pressure zone to another.

I feel that in similar questionable zones, conductor pipes as a part safety valve should be made mandatory and conditional on regional water board permits.



The rig used on the job described in the article with, inset, the driller in charge, Murray Gillies.

DSIR drilling rigs see the world in long quest for resources

NEW ZEALAND'S seemingly endless search for energy, minerals and scientific information has taken the DSIR's geophysics division drilling rigs all over the South Pacific, from Antarctica to the tropics.

And the information that they have come up with has resulted in the development of geothermal power, natural gas and ironsand resources that are to play an important part in future development.

The man who has headed the DSIR drilling section since it was established is Mr Jack Hoffman, the only honorary member of the New Zealand Drillers' Federation.

He has had a lifetime in the business, working for the company that is now Rotorua Well Drilling Ltd in the days of the father of the present president of the Drillers' Federation, Mr Gordon Brown.

Drilling for scientific purposes is a lot different to commercial drilling, whether to supply a farmer with artesian water or to establish the practicality of putting a particular building on a particular site.

Mr Hoffman says that his drillers try to get at least a 98 per cent core, and are willing to spend the extra time and money to make that possible.

"We are able to go to the time and trouble of getting an almost perfect result, while a commercial driller could not afford that cost, and it wouldn't be worth his bother."



The drilling division operates two rigs — a Wabco CF15 with a rated capacity of around 550 metres, and a Sullivan 37 — one of two purchased in 1949, it has since been modified to a kelly drive with an automatic chuck.

Each year's drilling programme is dependent on financial allocations, but Mr Hoffman says that enough money is usually available for work to be carried out during nine months of the year, and in the other two months

the rigs are returned to their Lower Hutt base for repairs and maintenance.

The division really got into business during the early 1950s when three Sullivan 37s — one purchased in 1939 — were concentrated on the geothermal areas of the central North Island. The Wairakei No 1 hole, and the first temperature hole at Kawerau, were both drilled by the section's rigs.

In 1955, the section carried out the initial oil search investigations in Taranaki, drilling a series of holes around the periphery of Mt Egmont. Shell-BP-Todd took over this work, using the section's rigs, from 1956-58 and the section was out of business for this period.

When that programme was finished, the oldest Sullivan was pensioned off and DSIR work began again in 1959 with a programme of 150 metre holes for a study of natural heat flow throughout the North Island.

Mr Hoffman was involved with the beginning of New Zealand's Antarctic scientific programme in 1957, when he was associated with the construction of Scott Base.

In 1960, one of the Sullivans was flown to McMurdo Sound where it drilled a 275 metre hole as part of the site investigation for the establishment of the small nuclear power sta-



Left, a panoramic shot of the New Zealand-staffed drilling camp at Lake Vanda, in the Antarctica. Lower left, a helicopter lowering a section of the drilling rig into the camp. Lower right, a DSIR rig on water resource survey on Tonga.

tion that provides McMurdo Sound with its electricity.

And for four summers, between 1972 and 1975, the section provided all the staff for a joint US-Japan-New Zealand drilling programme in the Dry Valley.

Mr Hoffman says that working in Antarctica offers many challenges, apart from the obvious one of dealing with the severe cold on the continent. Each operation is a major logistical exercise that requires months of detailed planning, because it's not just a question of jumping into a ute and heading down to the local garage if a part fails, or something is lost.

For the Dry Valley programme, all equipment and supplies had to be ferried in by helicopter in sections weighing no more than one tonne. Rigs had to be broken down for shipping, and then assembled on the site before work could begin.

Tight environmental controls, which were enforced by US environmental scientists who work in Antarctica for just that purpose, also made operations unconventional.

All rubbish had to be stored and was flown out by helicopter at regular intervals. As well, the in-going and out-going loads were weighed and if there was any large discrepancy between the weight of material that



went onto the job and the weight of material that came off it had to be announced for.

"If we spilled a can of oil on the ground, work had to stop while we all got round and cleaned it up, to prevent it spreading and doing any damage," Mr Hoffman said.

During the early 1960s the section was involved in investigations of the ironsand deposits on the west coast of the North Island. These now support

exports from Waverley, north of Wanganui, and Taharoa, on the Waikato coast, and supply New Zealand Steel's Glenbrook mill.

Over 100 holes, with a total depth of more than 2 000 metres, were drilled and 79 of those holes were hand augered.

In 1960, the section drilled in the South Island for the first time when two holes were sunk at Hanmer Springs so that temperature gradients could be tested, and a series of 19 holes were drilled in the Nevis Valley, Central Otago, as part of investigation of the economic potential of the region's oil shales.

That era saw renewed interest in oil exploration and the section did work for a number of companies including Hyde Oil, in Northland, Lime and Marble, in Nelson, and the New Zealand Petroleum Exploration Co Ltd, in Southland.

Investigation drilling also included work on the Ngawha geothermal area — a site chosen in the latest power plan for a station that will be in operation by the early 1990s — and coring of pottery clays in North Auckland and copper deposits at Pupuke.

Since 1966, when it was decided to provide DSIR geologists with a drilling service, a programme has been maintained with nearly equal time division between research stratigraphic drilling and other objectives.

In recent years this work has included exploration of the Southland and Kamo coal fields, and the determination of depth to basement below alluvial areas of Wellington to assist with earthquake research.

In 1974, wire-line core drilling was introduced after Antarctic experience with this technique.

The skill of the drillers was further tested in 1975 when a 100 metre hole of 20cm diameter was drilled near Wellington to accommodate seismometers of the joint US-NZ Seismic Research Observatory. Specifications for the hole was extremely rigid, and the hole had to be drilled within three degrees of the vertical. It was completed to within 20 minutes, or one third of a degree from vertical.

Later that year the modified Sullivan 37 drilled a series of bores to exploit and monitor the freshwater lens of Tonga as part of New Zealand's foreign aid programme.

Mr Hoffman points out that the section's drills do not compete with private enterprise, although they have carried out some work for the department, including the drilling of foundations for the new oceanographic research facilities at Evans Bay, near Wellington.



The DSIR's newest rig, a Wabco CF15 with a rated capacity of around 550 metres, at work in New Zealand with a service vehicle in the background.

"Our work is completely different in nature to that carried out by most New Zealand drillers," Mr Hoffman said.

And with the record of the section there for anyone to look at, it is a statement with which no one could argue.

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New pump range from Browns

HIGH HEAD centrifugal pumps are now being produced in New Zealand by a local manufacturer.

Brown Bros Ltd, of Christchurch, have become the first firm in Australasia to build the internationally respected Grundfos range of vertical multistage pumps.

These pumps have many uses where small capacity high head pumping is needed. Built with substantial local content, they can have up to 20 stages to handle heads as high as 184 metres. Compared with horizontal centrifuges, the vertical type occupy less space, and have none of the valving complexities of plunger pumps.

Each unit despatched from the factory has undergone a 'wet test'. The pumps are notable for their stainless steel internal parts and tungsten carbide seal surfaces. Double-curvature vanes are among the high technology features perfected by Grundfos.

Brown Bros have planned to meet substantial demand with an ex-stock supply of pumps and parts through nationwide distributors.

Information from
Brown Bros Ltd
Box 548
Christchurch
Ph (03) 50 279

Aussie pumps sold in NZ

CENTRIFUGAL water pumps produced in Australia for a wide variety of industrial, commercial, municipal and agricultural applications are now available in New Zealand.

Produced by the Victoria-based company, Industrial Engineering Ltd, the range of products is headed by four major types, including Monoflo, Uniflo, Spiroflo and SLA mixed flow.

Standard manufacture is cast iron and mild steel but pumps also are available in bronze, stainless or cast steel.

The Monoflo range comprises general purpose single-stage end-suction pumps in sizes from 2.54cm to 30.48cm with capacities to 450 litres per second.

Models in this range also are manufactured as sump pumps or cantilever type configuration. Heads are up to 240 metres.

Uniflo pumps are horizontal split-case double suction of both single and two-stage configuration. Sizes are up to 111.76cm with capacities to 450 litres per second and heads to 400 metres.

The Spiroflo range comprises multi-stage pumps for boiler feed and high discharge heads. Sizes are from 2.5cm to 20cm with capacities of 185 litres a second and heads to 400 metres.

The SLA mixed flow pumps are designed for high flows and low heads with high suction lift. They are suitable for flood, irrigation, drainage and industrial applications and can be angle mounted for river bank installations.

Sizes are 30.48cm to 35.56cm and 38.10cm to 47.72cm with capacities to 833 litres a second and heads to 22 metres.

Information from
Andrews and Beaven
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Atlas Copco button bits

BIG IMPROVEMENTS in the performance of button bits are being claimed by Atlas Copco.

Continuous development work at the company's laboratories has resulted in field reports that show the performance of small button bits has improved considerably.

The development has come with the introduction of powerful hydraulic rock drills that have substantially increased the energy transmitted to the bit.

When button bits were first introduced by Atlas Copco and Sandvik the work called for new cemented carbide grades with characteristics to make the bits more resistant to wear, longer lasting and able to meet the demands of the bigger, heavier and harder hitting rock drills.

The latest tests have been carried out with a COP 1038 hydraulic rock drill mounted on a Promex TH468 drill rig.

Other developments announced by the company recently include the development of a new and improved version of the light rock drill, and a new hydraulic rig that is specifically designed for underground mining.

The new Tiger drill is designed with a large piston diameter, operating with a high impact rate, making it particularly effective when working in non-consolidated or poor rock. The new version has been designed with a new intermediate part and a lighter more compact attachment device for the feed leg.

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Polymer fluids offer big advantages to drillers

by Mike Blong
Drilling Fluid Engineer
Drilling Services & Supplies Ltd

WATER HAS always been the fastest drilling fluid medium but, because it has no inherent lifting capacity or sealing properties, the initial advantage of fast penetration is often lost because the hole problems and the consequent need to mud up.

Until recently mudding-up was usually accomplished by adding a clay (bentonite) to the water. This method is still used today, but drilling

operators have found definite advantages in using a polymer-type drilling fluid.

Most drilling fluid polymers, because of their shear-thinning characteristics, will allow the faster penetration rate achieved with water and provide lifting capacity and sealing properties.

The polymer fluid shear thins to be like water at the normal pumping rates but when the pumping rate slows or stops it immediately thickens to act like a clay-based mud.

Core drilling, mining and water-well drillers throughout the world are now using polymer drilling fluids because they are particularly suited to their type of operation. Because 0.5-2.5kg of polymer is sufficient for more than 450 litres of drilling fluid, an operator can usually quite comfortably hand carry all his 'mud' requirements for an entire well. Polymer drilling fluids can offer fast penetration rates, hole stability, savings in transport, handling and storage costs, instant yield compared to bentonite, and are compatible with all water based drilling fluids.

Two polymers extensively used in Australia are now available in New

Zealand — Rapid-Trol and Gran Pol 40.

- Rapid-Trol polymer forms a viscous clear fluid when mixed with any water type. It forms a protective membrane around drilled solids, inhibiting hydration and improving solids control. By the same means, it also improves core recovery. Rapid-Trol assists in building a thin, tough wall cake, improving hole stability, it also assists lubrication of the drill string. Rapid-Trol may be mixed directly into water, or pre-mixed with diesel. It is available in one kilogram plastic packs, which will usually be adequate to viscosify 500 - 600 litres (110-130 gallons) of water.

- Gran Pol 40 is a rapidly soluble viscosifier and fluid loss control agent. Gran Pol 40 has the same hole stabilizing properties as Rapid-Trol but is designed to require minimal mixing on the rig site. It comes in 2.5kg plastic resealable jars, and up to two kilos will usually be adequate to viscosify 500-600 litres of water. Gran Pol 40 is recommended not as a drilling fluid additive for use in a remedial sense, but as a fluid additive for use as a day to day additive to avoid situations where remedies are needed.

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