

SPOTLIGHT

on heap leaching

by R.A. SNODGRASS*

Heap leaching is a topic that is gradually generating more interest in South Africa as more non-Witwatersrand gold deposits are being investigated. This was evident from the number of delegates (85) who supported the SAIMM School on Heap Leaching, which was held at Mintek from 29th February to 3rd March, 1988.

The School had an international flavour, with two lecturers from the U.S.A., two delegates from Spain, one from the U.K., and three from Zimbabwe.

Lectures

The topics covered during the first day included an evaluation of projects, pad and heap construction, and various types of ores treated in the U.S.A. Although the emphasis was on gold and silver leaching in North America, the general principles are applicable anywhere and also to copper ores.

On the second day, solution chemistry was discussed, scaling being highlighted as a major problem. It is im-



L. to R.: Dirk van Zyl (U.S.A.), Omar Muhtadi (Bateman, Reno Nevada), Richard Beck (Gold Fields), Gene Fivaz (Chamber of Mines Research Organization), and Ben Alberts (Isacor)

L. to R.: Peter Smith (Anglo American Corp of S.A.), Wally Channon (Anglo American, Zimbabwe), Waddilove Furusa (Lonhro, Zimbabwe), and Graham Jenery (Gencor Process Research)



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portant to monitor the scale-forming tendencies of solutions so that timely action can be taken through the addition of suitable chemicals. The solutions are applied to heaps by a wide variety of sprinklers including 'wobblers', 'wiggers', and drip-irrigation tubes. These sprinklers are designed to minimize losses due to impact, evaporation, and wind. Prior to pad construction, a geotechnical survey is essential so that liner damage can be prevented and heap stability ensured.

Guidelines were provided for liner design for pads, as well as for solution ponds. Liner construction combines the use of geomembranes, clays, and drainage layers. This topic was of particular interest since correct liner design is critical for a successful operation.

On day 3, the topics covered were solution control and the everpresent regulatory aspects.

As South Africa is a semi-arid region, one can generally expect a net evaporation of solution. This fact eases problems related to effluent disposal. However, during



L. to R.: Ben Geerdink (Vaal Triangle Technikon) and Allan Lever (Aquatant)

the design phase, allowance has to be made for rainfall runoff and occasional floods. In general, short-term rainfall events are used in the sizing of hydrologic controls, and long-term events in the provision of hydraulic controls, i.e. pond size.

The maze of legislation relevant to establishing a heap-leaching operation was covered. This includes the Mines and Works Act, Water Act, Environmental Conservation Act, Health Act, Hazardous Materials Act, etc. An interesting observation was the trend for these Acts to be made retrospective, an example being related to groundwater pollution. This could have serious repercussions even long after the completion of an operation.

It was suggested that legislation related to cyanide should be based on free or weak-acid dissociable cyanide, rather than total cyanide, which includes strong stable complexes.

A number of very successful discussion sessions were held during the School. In the past this had not always been successful. However, the relaxed atmosphere and lively discussion initiated by the lecturers encouraged participation by the delegates.

Field Trip

On day 4, Anglo American hosted a field trip to their Drylands heap-leaching operation, which is located to the northwest of Carletonville, adjacent to the Krugersdorp-Ventersdorp road, where delegates were able to view the only agglomerated heap-leaching project in South Africa. Although the project is in the early stages of commissioning, the delegates were able to observe the application of several concepts that had been dealt with in the lectures.

Barbecues

Two barbecues were held during the School. That on the first evening of the course was sponsored by E.L. Bateman, and that at the conclusion of the field trip to Drylands by Anglo American Corporation.



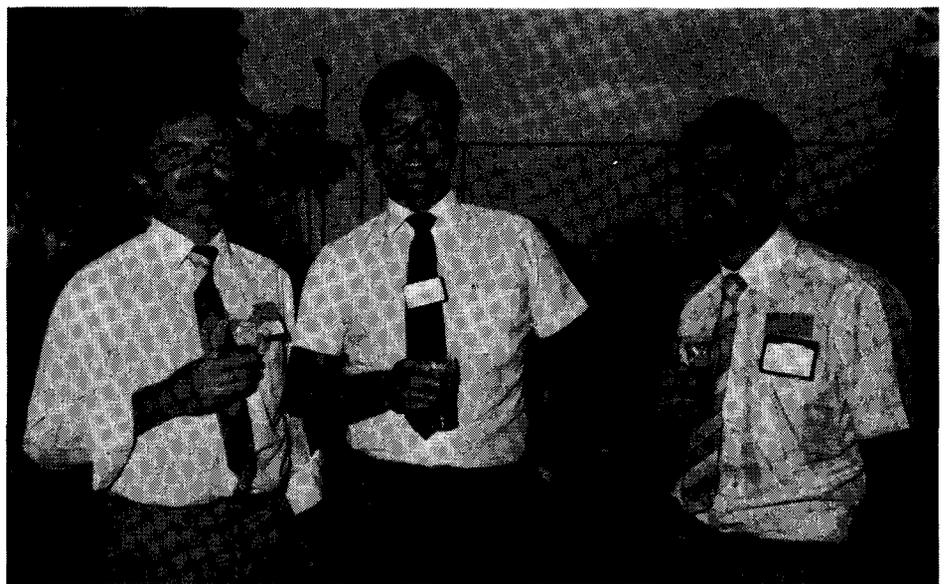
L. to R.: T.J. Beal (Tsumeb), Kenneth Donally (Iscor), Mariano Menendez (Rio Tinto Minera, Spain), and John Rennie (Tsumeb)

L. to R.: Shaun Simmonds (Freegold North), André Niemandt (Rössing Uranium), and Michael Saner (Gencor)



L. to R.: Koos Coetzee (Randfontein Estates), Gordon McPhail (Steffen, Robertson & Kirsten), Larry Cramer (Randfontein Estates), and Ken Lyell (Anglo American Corp of S.A.)

L. to R.: Roger Wintle (Gold Fields Laboratories), Cliff Wilks (AECI Chlor-Alkali & Plastics), and C.J. Uys (Gold Fields Laboratories)

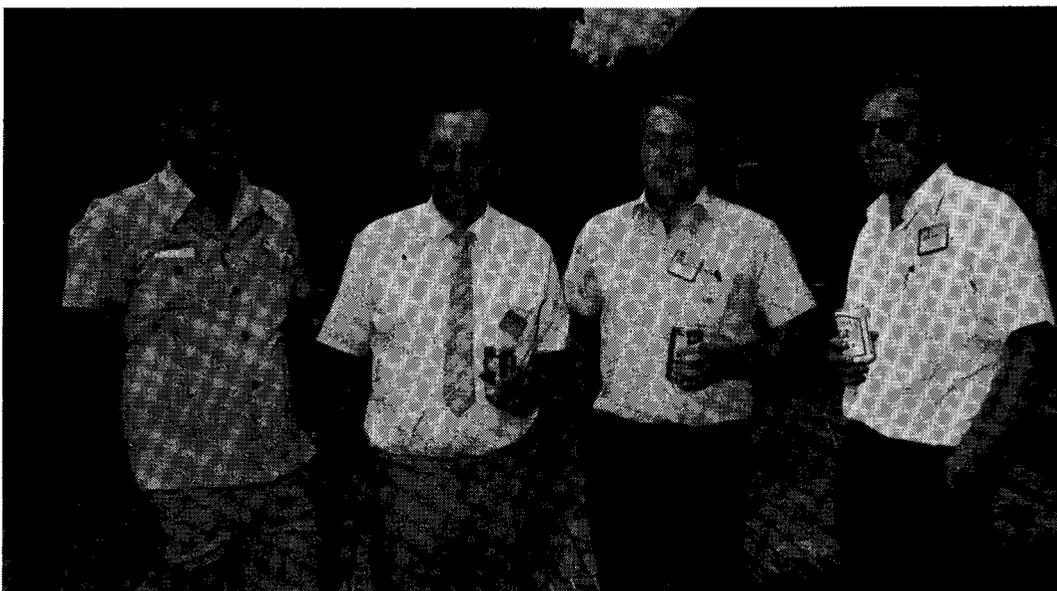




L. to R.: Omar Muhtadi (Bateman, Reno Nevada), Mike Storey (Geomet, Zimbabwe), and Terry Hook (S.A. Cyanamid)



L. to R.: Mike Storey (Geomet, Zimbabwe), Derek Lutz and Dave Winterburn (S.A. Cyanamid), and Howard Nicholson (Lonhro, London)



L. to R.: Nick Greeve (St Helena), Wessel Gelderblom (St Helena), Jan Smit (Buffelsfontein), and Henk van Heerden (Beatrix)