ENVIRONMENTAL ASPECTS OF EXPLORATION IN THE EROMANGA BASIN ARID ZONE

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BIOGRAPHY

Dr. Buckley has worked on environmental aspects of the arid central Australian dunefields since 1975, and prior to that in similar arid environments in East and South Africa and North America. He has a B.A. and M.A. in Natural Sciences from Cambridge, a Ph.D. on 'Soils and vegetation of central Australian sand-ridge' from the Department of Biogeography and Geomorphology, A.N.U., and has written 28 papers on the central Australian dunefields and a range of consultant reports.

Currently Environmental Consultant at The Australian Mineral Development Laboratories, he maintains a close interest in all aspects of development in the Australian arid zone, particularly the central dunefields such as those overlying much of the western Eromanga Basin. He is concerned firstly that engineering, economic and environmental aspects of development should be considered concurrently at all stages of development from exploration to end use, and secondly that the impacts of mining be viewed in their proper context relative to those associated with other human activity in the region.

SUMMARY

A large proportion of the Eromanga Basin lies under arid dunefields. The environmental aspects of exploration in such areas are very different from those in wetter and more densely inhabited regions. The main aspects of exploration derive from the extensive track cutting required for geophysical survey and drilling programmes.

The immediate effects of cutting tracks, namely removal of vegetation and increased sand mobility, are localised and relatively insignificant. More important are secondary disturbances associated with the increased access to four-wheel drive vehicles: these include an increase in fire frequency, introduction and spread of weeds, and destruction of native fauna. The impact of fire is not likely to be detrimental as long as the fires are limited in area and occur in winter. Shooting, etc., is confined to areas adjacent to tracks. Hence the main requirement for 'environmental hygiene' in uninhabitated arid dunefields is to monitor and eradicate weeds, as far as this is possible.

Besides the main dunefield areas, exploration in the western Eromanga Basin may involve operations on stony or gibber plains, sandplains, ranges and outcrops, salt lakes, and watercourses and floodout areas. Tracks cut in sandplain and gibber areas remain visible for decades. 'Spinifex' hummock grass and mulga or gidyea over tussock grasses on sandplain carry fire well, and summer wildfires are a potential hazard in areas which have not been burnt recently.

Watercourses and flood plains are the most fragile areas in the arid zone. Disruption of surface hydrology can have major impacts on the vegetation. Much of the arid zone fauna is concentrated in such areas, and such modification of the vegetation therefore has a greater impact on the fauna than in sandridge areas. Watercourses are also particularly susceptible to introduction of weeds which can persist there through droughts which would eradicate them in the sandridges. Ranges and outcrops also have a relatively rich and easily disturbed fauna; waterholes in particular represent fragile ecosystems and should be avoided.

Besides surface disturbances as outlined above, drilling can contaminate potable groundwater if aquitards between sweet and saline aquifers are perforated. Groundwater invesitgations are frequently a standard part of exploration geology, but particular attention should be paid to sealing exploration drill holes in, e.g., artesian and subartesian areas.