

COORDINATED LOCAL AND REGIONAL MONITORING OF AIR POLLUTANT EFFECTS ON ECOSYSTEMS

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Mineral processing industries have developed rapidly in a formerly rural area of coastal Queensland due to the availability of energy, raw materials resources and deep-water access. The region has acknowledged ecological values and borders the World Heritage-listed Great Barrier Reef, and is located in an area of complex terrain for which there is limited meteorological information. A coordinated environmental monitoring program is being developed to optimise the planning certainty for existing and proposed industries, the quality of environmental information gathered and the protection of ecological values. A key feature of the program is the recognition of ecosystems that may be at risk from development in general or from particular industrial emissions. The large number of regional ecosystems and species (over 500 native plant and 100 native faunal species) that might be affected requires the selection of key species that are judged to be functionally critical in their ecosystems, vulnerable to extinction or sensitive to pollutants. Because the pollutant responses of fewer than 10 per cent of species are known, the selection of indicator species across the region is impossible. Coordinated ambient monitoring, dispersion modelling and detailed ecological assessments are being used to analyse and predict ecological changes with the greatest economy of resources. Environmental management guidelines will be formulated progressively as industrial development proceeds and the amount and quality of information increases. This program may serve as a model for environmental modelling in resource-limited situations where there is incomplete information on ecosystem characteristics and responses to pollutants.