

Fimiston project stage II - mine and waste dumps

Kalgoorlie Consolidated Gold Mines Pty Ltd

**Report and recommendations of the
Environmental Protection Authority**

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Foreword

Over the last decade improvements in the technology of gold extraction have led to significant changes in mining in and around Kalgoorlie. Gold may now be extracted from ores with much lower concentrations of mineral, and the emphasis of mining has been on "halo ores"; or the low-gold ore which surrounded smaller bands of higher-gold ores. This has meant that large mines extract large ore bodies.

New technology has also meant that it is profitable to re-work old tailings.

In the mid 1980s the Environmental Protection Authority recognised that the new technology of extraction would lead to substantial environmental pressures in and around Kalgoorlie. The Authority decided that it was appropriate to try to provide an integrated plan to manage the environmental impacts of mining and extraction of gold, so that each individual development could be viewed within the context of overall environmental protection in the region.

In 1987 the Environmental Protection Authority proposed, and the Government subsequently implemented, an Environmental Protection Policy for the control of sulphur dioxide in the air environment of Kalgoorlie-Boulder. This policy has resulted in better air quality for Kalgoorlie than in the previous decade, despite significant increases in the amount of ore processed.

At the same time the Environmental Protection Authority notified the Government that it was appropriate to have coordinated consideration of open cut mining of the Golden Mile. In addition, mining plans should be integrated with plans for tailings and overburden disposal and that consideration should be given to integrated disposal from the old, re-worked tailings. Other issues such as the availability and quality of treatment water, and its potential environmental impacts were also identified as requiring attention.

In July 1989 the Minister for Mines released the Department of Mines publication, "Conceptual Plan for Mining Developments on the Golden Mile". This plan, developed by the Golden Mile Mining Development Planning Committee, was a major step forward as it provided a critical framework for future mining development in the region. For the first time there was a definite separation of residential development from mining and further separation of waste areas and tailings disposal sites. When combined with the new development of town plans for the City of Kalgoorlie-Boulder and the relocation of gold roasters as a consequence of the environmental protection policy for sulphur dioxide there was the basis for integrated planning to both benefit industry and to protect and enhance the local environment.

Since 1988 the Environmental Protection Authority's assessments of new projects have been made within the regional context set by the Conceptual Plan and its draft precursor. The first such assessments were the Kalgoorlie Tailings Retreatment project and the Proposed Satellite Gold Roaster in April/May of 1988.

The present proposal, Fimiston Project Stage 2 Mine and Waste Dumps is consistent with the Conceptual Plan previously accepted by the Environmental Protection Authority and therefore in general is environmentally acceptable. Some details of the specific project require further comment, especially those relating to on-going management of environmental and social impact on near neighbours.

During the current assessment of the proposal by Kalgoorlie Consolidated Gold Mines for expansion of the gold mining operations on the Fimiston leases it has become apparent that the major outstanding issues associated with the proposal relate to the proximity of mining operations to the urban areas of Kalgoorlie/Boulder, particularly in the vicinity of Hainault Road and Williamstown. The Environmental Protection Authority considers that the environmental issues have been addressed adequately by either environmental management commitments given by the proponent or by the Environmental Protection Authority's recommendations in this report.

The proximity of urban areas to mining areas occurred as a result of mine workers traditionally seeking accommodation close to their place of work and has evolved to the point where the advent of open cut mining has exacerbated problems of having two conflicting land uses in close proximity to one another. This has led to loss of amenity for the residents and constraints on existing and future mining operations for the mining companies.

Submissions to the Environmental Protection Authority on the proposal were predominantly related to the operational effects of the mining operations along the Golden Mile on the community in general, but with particular reference to those communities in close proximity to the mining operations. This interest was sparked by discussion in the Consultative Environmental Review of a buffer zone to separate the mining and urban areas. The idea of a buffer zone was first mooted in the Conceptual Plan For Mining Developments on the Golden Mile (1988) prepared by the Golden Mile Mining Development Planning Committee.

In response to concerns expressed by Williamstown and Hainault Road residents, the State Government, in January 1991, announced that a social impact study would be conducted examining the affect of mining activities along the Golden Mile on surrounding residential areas. This study is to be overseen by a community based steering committee and will report on a broad range of issues including: the proposed buffer zone, loss of amenity, viability of Williamstown, and future mining plans. The committee will report its findings to the Golden Mile Mining Development Planning Committee and the Minister for Mines during June 1991.

The Environmental Protection Authority recognises that there are in place mechanisms to resolve those few outstanding social and land use conflicts associated with this expansion. The Authority reiterates its previous support for the use of the concept of adequate separation between mining and residential land use as the basis of a long term mechanism to alleviate conflicts. The mechanism for achieving this separation involves planning, mining and land use issues, and the Authority recognises that there is current consultation with Kalgoorlie Consolidated Gold Mines, the City of Kalgoorlie-Boulder and the affected residents. The Authority suggests that it is now timely for these discussions to recommend solutions to those few outstanding issues prior to starting the proposed expansion.

1. Introduction

So as to manage the potential environmental impacts associated with the changing mining regime on the Golden Mile the Environmental Protection Authority recommended in 1987 that there be a properly integrated plan for future development. At that time the Authority was concerned about the potential for significant environmental and social impacts from large scale uncoordinated development. In response the Government established the Golden Mile Mining Development Planning Committee to coordinate development in the area. In 1989 this Committee released the Conceptual Plan for mining developments on the Golden Mile as a framework within which future development would occur.

The Fimiston proposal was referred to the Authority by the Department of Mines on behalf of the proponent, Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM). A level of assessment of Consultative Environmental Review (CER) was set for the proposal owing to the proximity of the development to the City of Kalgoorlie/Boulder.

The proposal to expand the operation includes rationalisation of the open pit operations into a single operation that will extend for a period of at least 15 years.

2. Proposal description

KCGM are currently operating open pit and underground gold mines on the Golden Mile, which is an historical gold mining area adjacent to the urban area of Kalgoorlie/Boulder.

The proposal involves an expansion of existing open-cut mining activities. KCGM intends to rationalise the various open-cut mining operations on the Fimiston mining leases into a single operation. This would entail incorporation of the existing open pits into two large open pits to be known as the Combined Pit and the Western Lodes. There will be large scale mining of the Combined Pit with the Western Lodes being used as a flexible reserve. Open cut mining of this area is expected to last at least 15 years. New waste dumping areas will be required to accommodate material from the expanded open pit. These new areas will be located to the east of the pit between the expanded pit and the Trans Australian railway line (figure 1).

The proposal incorporates the recommendations of the Golden Mile Mining Development Planning Committee.

3. Existing environment

The vegetation of the Golden Mile has been severely degraded by past gold mining activities. Surface drainage is poorly defined and ephemeral, and the groundwater is generally hypersaline and unsuitable for human or animal consumption.

4. Environmental assessment and recommendations

A number of environmental issues were identified by the Environmental Protection Authority from its own assessment and as a result of submissions. This report makes recommendations for the mitigation of impacts and the adequate environmental management of the project.

Recommendation 1

The Environmental Protection Authority concludes that the proposal to expand the open cut mining and waste dumping activities on the Golden Mile is consistent with the previously approved conceptual plan, and is environmentally acceptable.

In reaching this conclusion, the Environmental Protection Authority identified the main environmental factors requiring detailed consideration as:

- **rehabilitation of the disturbed areas, particularly the waste dumps, to provide a stable, non-erodable surface in the short term with a view to creating a final landform that can be utilised for other purposes at the end of mine life;**
- **impacts associated with dust and noise from the mining operation;**
- **location of waste dumps;**
- **impacts from the use of hypersaline water for dust suppression; and**
- **modification to surface drainage increasing the potential for flooding on-site.**

The Environmental Protection Authority concludes that the environmental factors mentioned above have been addressed adequately by either environmental management commitments given by the proponent or by the Environmental Protection Authority's recommendations in this report.

Accordingly, the Environmental Protection Authority recommends that the proposal as described in the Consultative Environmental review could proceed subject to:

- **the Environmental Protection Authority's recommendations in this Assessment Report; and**
- **the proponent's commitments to environmental management (Appendix 1).**

4.1 Rehabilitation of the operation

The Golden Mile has been subject to disturbance from mining operations for many years with limited rehabilitation of the area to date. Expansion of the gold mining operations at Fimiston by KCGM will result in a marked change to the present landform of the area.

In view of these considerations KCGM are in the process of preparing an environmental management programme (EMP) for the whole of their Golden Mile operations. The rehabilitation component of the EMP will address the rehabilitation of the disturbed areas associated with the operation, principally the waste dumps.

Recommendation 2

The Environmental Protection Authority recommends that within twelve months of the date of any environmental approval issued by the Minister for the Environment, the proponent submit and subsequently implement detailed ongoing rehabilitation plans for the Golden Mile mining operations, to the satisfaction of the Department of Mines on advice from the Environmental Protection Authority. These plans should be reviewed initially on an annual basis for the first two years, and thereafter at five yearly intervals.

4.2 Dust and noise

The proximity of the Golden Mile mining operations to urban areas of Kalgoorlie/Boulder means that there is a high potential for impacts from dust and noise on the nearby residents. KCGM have recognised the need to control impacts from dust and noise and have made specific commitments (nos. 6 and 7, Appendix 1) to monitor and develop strategies to reduce any such impacts.

Recommendation 3

The Environmental Protection Authority recommends that the proponent ensure there are no unacceptable detrimental effects from dust and noise from this expansion proposal on the amenity of nearby residents. Accordingly, within six months of the date of any environmental approval issued by the Minister for the Environment, the proponent should prepare and implement a dust and noise monitoring and management programme to the satisfaction of the Environmental Protection Authority.

4.3 Location of proposed waste dump

As a result of public consultation the location of the north-east and south-east waste dumps was found to be in close proximity to a number of residences with special leases under the Land Act (Figure 1). KCGM has modified the boundaries of the waste dumps to modify potential impacts from dust and noise, however, it is considered that should dumping proceed the residents could suffer loss of amenity during unfavourable climatic conditions and if dumping is conducted outside normal working hours. In further discussions between the Authority and KCGM, it has been determined that the proponent can dump in other areas away from these residences until a method of minimising the adverse environmental impacts of waste dumping on residents is found.

Recommendation 4

The Environmental Protection Authority recommends that, prior to the dumping of waste on the proposed north-east or south-east waste dumps within 500 metres of residences, the proponent should prepare and implement a management plan for waste dumping to ensure there is no unacceptable detrimental effect on these residents, to the satisfaction of the Minister for the Environment on advice from the Environmental Protection Authority.

4.4 Impacts from hypersaline water

Hypersaline water is used for processing purposes and dust suppression. The water is pumped from remote borefields located to the north and south of the operation, at Gidgi and Lakewood respectively.

The impacts from hypersaline water are considered to be minimal in the disturbed mining area, however, the borefield pipelines traverse areas of high quality native vegetation and past spills have resulted in severe damage to native vegetation. It is considered that a review of these water supply systems is required with a view to providing more adequate safeguards to prevent further saline water spillages.

Recommendation 5

The Environmental Protection Authority recommends that the proponent ensure there are no unacceptable detrimental effects upon the environment resulting from leakage of hypersaline borewater along the Gidgi or Lakewood borefield systems. Accordingly, within six months of the date of any environmental approval issued by the Minister for the Environment, the proponent should prepare and implement a review of the operation of the borefields and pipelines to the satisfaction of the Environmental Protection Authority. This review should include proposals for improved design, maintenance, and monitoring for these facilities.

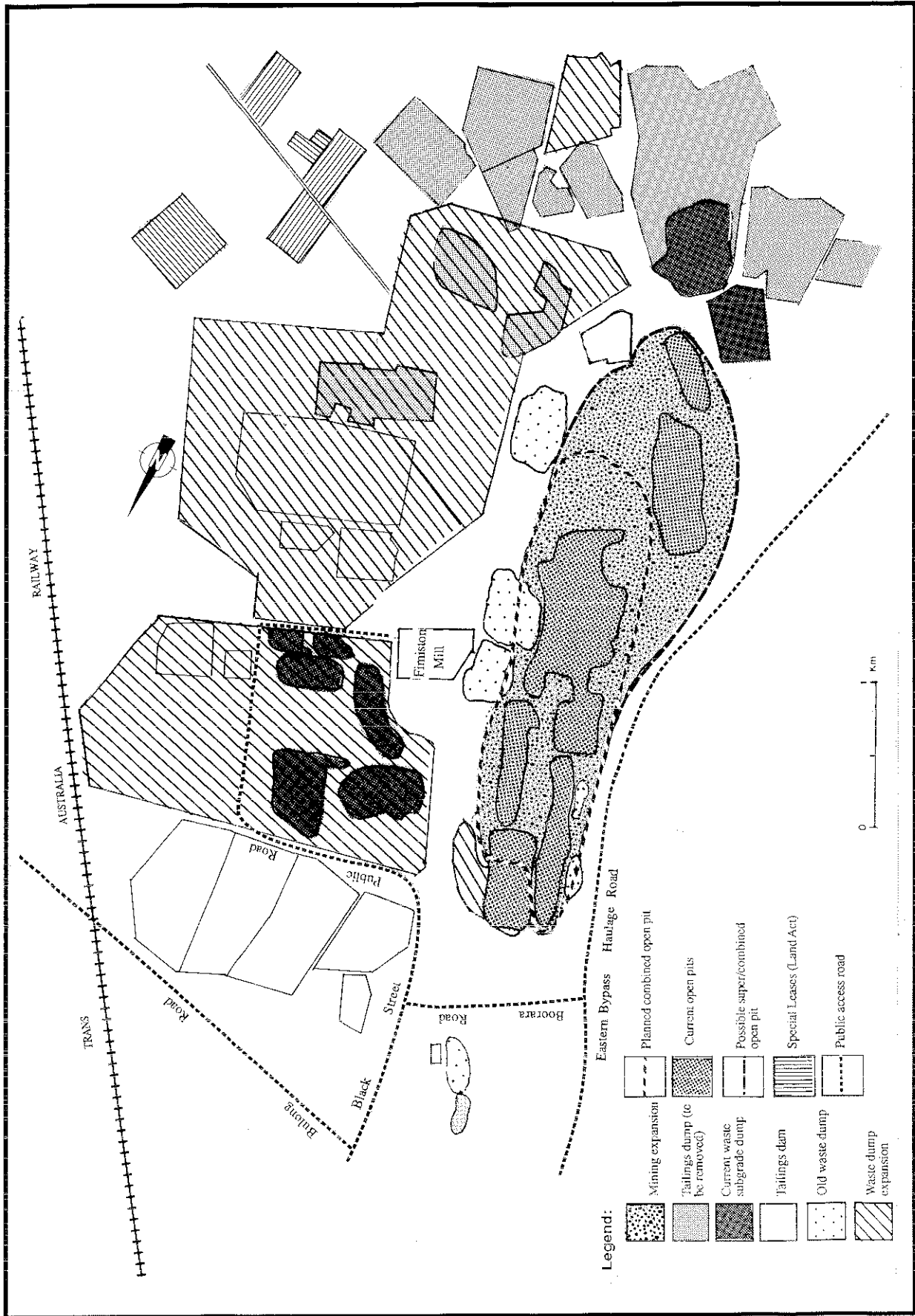


Figure 1. Location plan

4.5 Drainage

A major drainage channel runs just to the east of the proposed location of future waste dump areas. The proponent has recognised the need to protect this channel from modification by waste dumping and will ensure that waste dumps do not encroach upon the drainage line.

4.6 Decommissioning

Recommendation 6

The Environmental Protection Authority recommends that the proponent should be responsible for final decommissioning and removal of the plant and installations and rehabilitating the site and its environs. Accordingly, at least twelve months prior to final decommissioning the proponent should prepare and subsequently implement, a decommissioning and rehabilitation plan to the satisfaction of the Environmental Protection Authority on advice from the Department of Mines.

5. Minor and non-substantial changes

The Authority notes that during the detailed implementation of proposals, it is often necessary or desirable to make minor and non-substantial changes to the designs and specifications which have been examined as part of the Authority's assessment. The Authority believes that subsequent statutory approvals for this proposal could make provision for such changes, where it can be shown that the changes are not likely to have a significant effect on the environment.

6. Lapsed proposal

The Authority considers that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should only occur following a new referral to the Authority.

Appendix 1

Summary of proponent's commitments

The following commitments have been developed to address these impacts.

COMMITMENTS

1. KCGM will prepare and implement, by December 1992, an Environmental Management Programme (EMP) for all of its operations in agreement with the Environmental Protection Authority and the Department of Mines.
2. KCGM undertakes to prepare annual reports of the Mining and Rehabilitation sub-programme of the broader EMP, as agreed with the EPA and the Department of Mines.
3. KCGM undertakes to continue an ongoing programme of geotechnical investigations for slope stability purposes and report the findings of these investigations to the Department of Mines.
4. KCGM will develop a surface drainage system incorporating sediment detention systems and a water quality monitoring programme. The results of the sampling will be included within the annual report and updated annually.
5. In association with the Goldfields Dust Abatement Committee and Kaltails, KCGM will install and support a Dust Monitoring Programme within the Kalgoorlie-Boulder area. The data obtained will be made available to the EPA via the Goldfields Dust Abatement Committee.
6. KCGM will undertake a review of all potential dust sources within its operation by August 1991. Where appropriate KCGM will quantify the significance of these sources in terms of their contribution to dust levels in Kalgoorlie-Boulder and where appropriate develop strategies to minimise that contribution. The results of the review will be provided in the annual report and updated annually.
7. KCGM will undertake a programme of noise monitoring to ensure continued compliance with occupational health and public nuisance noise requirements. If considered necessary an ongoing monitoring strategy will be devised.

8. KCGM will implement a progressive rehabilitation programme as outlined in section 4.3 as agreed with the EPA in consultation with the Department of Mines.