Kalgoorlie tailings retreatment project

Poseidon Gold Ltd

Proposed changes to environmental conditions

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 704
September 1993

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's report.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the contents of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of $10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment
12th Floor, Dumas House
2 Havelock Street
WEST PERTH WA 6005

CLOSING DATE

Your appeal (with the $10 fee) must reach the Minister's office no later than 5.00 pm on **14th October 1993**

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Appendices

1. Background

Anglo American Pacific Ltd (the proponent), currently trading as Poseidon Gold Ltd, received approval from the Minister for the Environment to develop the Kalgoorlie Tailings Retreatment Project on 3 June, 1988, subject to a number of legally binding environmental conditions, including a condition requiring the implementation of the major environmental commitments made by the proponent (Appendix 1; Ministerial Statement that proposal may be implemented).

That approval was given after an investigation of the site, the preparation of a Public Environmental Report (PER), the receipt of public and government agency submissions, and release of the Environmental Protection Authority's Report and Recommendations on the proposal (EPA Bulletin 334). Poseidon Gold, as the trading entity representing the original proponent, is now seeking to modify some of the commitments in the light of further experience following the commencement of operations.

2. The proposal

A representative of Poseidon Gold Ltd wrote to the Minister for Resources Development asking that four of the major environmental commitments in the Minister for the Environment's Statement be amended (Appendix 2). The Minister for the Environment requested the Environmental Protection Authority to report to him on the proposed changes under Section 46 of the Environmental Protection Act.

An officer of the Environmental Protection Authority inspected the Kalgoorlie Tailings Retreatment Project site and the proposed changes are discussed and summarised in Table 1.

Table 1. Proposed changes to original commitments

Original commitments	Proposed new commitments
Mined Tailings Dumps. Restoration programme. Commitment 2, dot point 2 - (1) Characterize soil, cross-rip and cover with 35-40mm nickel slag, or equivalent; (2) Leave to leach for at least two years; (3) Construct windrows of planting medium and conduct revegetation trials; (4) In the event that revegetation is unsuccessful, cover with waste rock or equivalent, as dust and erosion protection.	Conduct research on methods of rehabilitating the mined tailings dumps, and progressively establish a stable ecological community with landforms resistant to erosion and mobilisation of dust; monitor the success of rehabilitation and develop completion criteria.
New Tailings Storage Dam. Commitment 3, dot point 3 - Maintain freeboard at all times to contain a Probable Maximum Precipitation of 860mm, plus wave action.	The tailings storage should maintain sufficient vacant volume to contain a rainfall event of 135mm over 24 hours, the 1:100 years event.
New Tailings Storage Dam. Commitment 3, dot points 4 to 6, relating to rehabilitation of outer walls of the dam, involving flattening the walls to a slope of 1:4.	Tailings dam walls will be progressively rehabilitated, at an angle of 20 degrees or less and with regular berms, towards a stable ecological community with a landform resistant to erosion and mobilisation of dust.
New Tailings Storage Dam. Commitment 3, dot point 7, relating to rehabilitation of the top surface of the tailings dam.	Conduct research on methods of rehabilitating the upper surface of the tailings dam, and establish a stable ecological community with landforms resistant to erosion and mobilisation of dust; monitor the success of the rehabilitation and develop completion criteria.

2.1 Tailings dumps restoration programme

The proponent justifies the proposed change to Commitment 2 (Mined Tailings Dumps), on the grounds that the specific revegetation treatment originally committed to is only one of several potentially successful treatments that the company is researching. The proponent would like the flexibility to use the most successful technique in site specific circumstances.

2.2 Tailings dam capacity

The proponent justifies the proposed change to Commitment 3, dot point 3 (New Tailings Storage Dam), on the grounds that, firstly, the term "freeboard" does not correctly apply to a tailings dam where tailings slurry is beached around the perimeter and a central water body is formed; secondly, 860mm is far greater than a 1:100 year rainfall event (135mm) in the goldfields, which is the usual design criteria for dams.

The proponent operates a large dam facility which is subdivided by internal walls into six dam cells. The operation of each dam cell involves beaching the tailings slurry from the rim of the dam and the recovery of the decanted liquid from a sump in the centre. Hence, wave action does not impinge upon the dam walls under normal operating conditions. In circumstances when the dam was full, any wave action would be markedly attenuated by the shallow edges such that it would not compromise the integrity of the dam wall.

2.3 Tailings dam outer slope rehabilitation

The proponent justifies the proposed changes to Commitment 3, dot points 4 to 6 (New Tailings Storage Dam), on the grounds that the commitment to flatten the outer embankment to a slope of 1:4 would sacrifice the existing drain system, and is much shallower than the existing guideline (twenty degrees) of the Department of Minerals and Energy. The existing outer embankment is at an angle of twenty degrees already and any attempt to flatten it further to a slope of 1:4 would not be possible while the dam is in operation and, secondly, would not provide a significantly greater level of erosion control.

2.4 Tailings dam upper surface rehabilitation

The proponent justifies the proposed change to Commitment 3, dot point 7 (New Tailings Storage Dam), on the grounds that various methods of rehabilitating the upper surface of the tailings dam are currently being researched, including methods for hypersaline environments, and the proponent wants the flexibility to choose the most successful method.

Due to the on-going, active nature of tailings disposal operations, the ultimate method of rehabilitation would not be implemented until the cessation of disposal operations. At that stage the surface would be recontoured for long term stability and drainage control, and then finally rehabilitated.

3. Advice of the Environmental Protection Authority

Poseidon Gold Ltd's proposal to change the four original commitments was developed in consultation with the Environmental Protection Authority, the Department of Minerals and Energy and the Department of Resources Development.

The Environmental Protection Authority considers that the proponent has justified the proposed changes to the original environmental commitments, as discussed above, and makes the following recommendation:

Recommendation 1

The Environmental Protection Authority recommends that the proposed changes to the environmental commitments, as shown in Table 1, are environmentally acceptable.

In the next section, the Environmental Protection Authority has detailed the changes to the Minister for the Environment's Statement which amend the Environmental Conditions. The Authority recommends that the Minister amend Condition 1 to incorporate the implementation of the amended commitments. The Authority also recommends that the Minister take the opportunity to include the standard condition on compliance auditing in order to allow the effective auditing of the amended commitments, as well as the other conditions and commitments.

Recommendation 2

The Environmental Protection Authority recommends that the standard implementation and compliance auditing conditions be included in the conditions for this proposal.

The recommended amended environmental conditions which implement these recommendations are detailed below.

4. Recommended amended environmental conditions

STATEMENT TO AMEND CONDITIONS APPLYING TO A PROPOSAL (PURSUANT TO THE PROVISIONS OF SECTION 46 OF THE ENVIRONMENTAL PROTECTION ACT 1986)

PROPOSAL:	KALGOORLIE TAILINGS RETREATMENT PROJECT (093/821)
CURRENT PROPONENT:	ANGLO AMERICAN PACIFIC LIMITED
CONDITIONS SET ON:	3 JUNE 1988

Condition 1 is amended to read as follows:

1A Proponent Commitments

In implementing the proposal, the proponent shall fulfil the commitments (which are not inconsistent with the conditions or procedures contained in this statement) made in the Public Environmental Report as subsequently amended and reported on in Environmental Protection Authority Bulletin 704. (A copy of the commitments as amended in September 1993 is attached)

1B Implementation

Subject to the conditions in this amended statement, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications,

plans or other technical material in any way that the Minister for the Environment determines, on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

The following condition and procedure are inserted following condition 4:

5 Compliance Auditing
In order to ensure that environmental conditions and commitments are met, an audit system is required.

5-1 The proponent shall prepare periodic "Progress and Compliance Reports", to help verify the environmental performance of this project, in consultation with the Environmental Protection Authority.

Procedure

1 The Environmental Protection Authority is responsible for verifying compliance with the conditions contained in this statement, with the exception of conditions stating that the proponent shall meet the requirements of either the Minister for the Environment or any other government agency.

2 If the Environmental Protection Authority, other government agency or proponent is in dispute concerning compliance with the conditions contained in this statement, that dispute will be determined by the Minister for the Environment.

AMENDED ENVIRONMENTAL COMMITMENTS - SEPTEMBER 1993

General

1-1. Appoint a rehabilitation/environmental officer responsible for all monitoring programmes, revegetation trials and liaison with CALM.

Mined Tailings Dumps

2-1. Restore about 300ha, staged to follow monitor station moves.

2-2. Conduct research on methods of rehabilitating the mined tailings dumps, and progressively establish a stable ecological community with landforms resistant to erosion and mobilisation of dust; monitor the success of rehabilitation and develop completion criteria.

New Tailings Storage

3-1. Salvage timber and stockpile topsoil.

3-2. Construct an underdrainage system to return seepage to the plant.

3-3. The tailings storage should maintain sufficient vacant volume to contain a rainfall event of 135mm over 24 hours, the 1:100 years event.

3-4. Tailings dam walls will be progressively rehabilitated, at an angle of 20 degrees or less and with regular berms, towards a stable ecological community with a landform resistant to erosion and mobilisation of dust.

3-5. Superseded by 3-4.

3-6. Superseded by 3-4.

3-7. Conduct research on methods of rehabilitating the upper surface of the tailings dam, and establish a stable ecological community with landforms resistant to erosion and mobilisation of dust; monitor the success of the rehabilitation and develop completion criteria.

3-8. Monitor the tailings storage throughout the project life, and commission independent and qualified consultants to review the following data recorded by the proponent to reassess the operational procedures:

(1) Pressure heads in embankments and foundation.
(2) Settlement of embankments.
(3) Return water quantity and quality.
(4) Strength of tailings in embankments.
(5) Survey of embankment and beach levels.
(6) Dust levels, including one year of baseline measurement.
(7) Groundwater levels and quality in bores downstream of storage, including one year of baseline measurement.
(8) Bird activity.

Water Supply

4-1. Maximize return water from tailings storage.

4-2. Bury water supply pipelines.

4-3. Minimize clearing of pipeline track by following existing easements and cleared lines as far as possible.

4-4. Divert pipeline around large trees, wherever possible.

4-5. Replace and rake soil to promote natural regrowth following pipeline installation.

4-6. Construct sumps to contain water discharged during drilling and testing, and at scour valves.

4-7. Design abstraction rates to minimize the effect on adjacent groundwater users.

4-8. Monitor and assess the performance of the aquifer throughout the project life.

Social

5-1. Provide employment for about 67 persons.

5-2. Provide additional housing.

Project Closure

6-1. The rehabilitation programme will be completed and the project sites will be cleared of debris when the project closes.

Appendix 1

Statement of Conditions of approval and original environmental commitments

Ass # 093

Bull # 334

State # 030

MINISTER FOR ENVIRONMENT

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

KALGOORLIE TAILINGS RETREATMENT PROJECT

ANGLO AMERICAN PACIFIC LIMITED

This proposal may be implemented subject to the following conditions:

1. The proponent shall adhere to the proposal as assessed by the Environmental Protection Authority and shall fulfil the commitments made in the Public Environmental Report (copy of commitments attached).

2. Prior to clearing of the tailings storage site, the proponent shall consult with the Department of Conservation and Land Management, particularly regarding the salvaging of sandalwood.

3. Prior to commissioning, the proponent shall ensure that provision is made (to the satisfaction of the Minister for Environment) for the replacement of an area of greenbelt, equivalent to that which would be removed by the proposal, to maintain the environmental amenity in the vicinity of Kalgoorlie and Boulder.

4. Prior to commissioning, adequate mechanisms shall be in place to ensure that the replacement area of greenbelt has appropriate security of tenure, purpose and management, to the satisfaction of the Minister for Environment.

Barry Hodge MLA
MINISTER FOR ENVIRONMENT

Published on

- 3 JUN 1988

7th Floor, Mov Holman Centre

Phone (09) 325 4133

MAJOR ENVIRONMENTAL COMMITMENTS

1. General

- Appoint a rehabilitation/environmental officer responsible for all monitoring programmes, revegetation trials and liaison with CALM.

2. Mined Tailings Dumps

- Restore about 300 ha, staged to follow monitor station moves.

- Restoration Programme (to be carried out only with the permission of all underlying tenement holders):

  (1) Characterize soil, cross-rip and cover with 35 - 40 mm nickel slag, or equivalent.
  (2) Leave to leach for at least two years.
  (3) Construct wind rows of planting medium and conduct revegetation trials.
  (4) In the event that revegetation is unsuccessful, cover with waste rock or equivalent, as dust and erosion protection.

3. New Tailings Storage

- Salvage timber and stockpile topsoil.

- Construct an underdrainage system to return seepage to the plant.

- Maintain freeboard at all times to contain a Probable Maximum Precipitation of 860 mm, plus wave action.

- Progressively flatten the outer embankments and cover with at least 1 m of waste rock or equivalent to create a final slope of 1:4, or flatter. Cover with a layer of topsoil and mulch, and conduct revegetation trials.

- Maintain a maximum slope length of 30 m by constructing 5 m berms on the outer slope.

- In the event that revegetation on the outer embankments is unsuccessful, armour with further waste rock or equivalent, as erosion protection.

- Rehabilitate the top surface upon decommissioning by cross-ripping and covering with nickel slag or equivalent to minimize dust and enhance leaching. The surface will then be either revegetated or armoured, depending on the results of revegetation trials.

- Monitor the tailings storage throughout the project life, and commission independent and qualified consultants to review the following data recorded by the proponent to reassess the operational procedures:

  (1) Pressure heads in embankments and foundation.
  (2) Settlement of embankments.
  (3) Return water quantity and quality.
  (4) Strength of tailings in embankments.
  (5) Survey of embankment and beach levels.
  (6) Dust levels, including one year of baseline measurement.
  (7) Groundwater levels and quality in bores downstream of storage, including one year of baseline measurement.
  (8) Bird activity.

4. Water Supply

- Maximize return water from tailings storage.
- Bury water supply pipelines.
- Minimize clearing of pipeline track by following existing easements and cleared lines as far as possible.
- Divert pipeline around large trees, wherever possible.
- Replace and rake soil to promote natural regrowth following pipeline installation.
- Construct sumps to contain water discharged during drilling and testing, and at scour valves.
- Design abstraction rates to minimize the effect on adjacent groundwater users.
- Monitor and assess the performance of the aquifer throughout the project life.

5. Social

- Provide employment for about 67 persons.
- Provide additional housing.

6. Project Closure

- The rehabilitation programme will be completed and the project sites will be cleared of debris when the project closes.

Appendix 2

Poseidon Gold Ltd's proposed changes

POSEIDON GOLD LIMITED

A.C.N. 007 511 006

A PosGold Company

KALTAILS PROJECT:
Mt Monger Road, Lakewood
KALGOORLIE, Western Australia

Telephone : (090) 93 2755
Facsimile : (090) 93 1936

PO Box 2483, Boulder, WA 6432

FACSIMILE TRANSMISSION

TO: **JIM TRELOAR**
E P A

FROM: **LAURIE MANN**

DATE: **22 SEPTEMBER 1993**

SUBJECT: **PROPOSED CHANGES**

Thank you for your recent communication with the redraft of the proposed changes. These changes are acceptable to us and the detail of these changes are in the following table:

Original Commitments	Proposed Changes
Mined Tailings Dumps Restoration Programme. Commitment 2, dot point 2- (1) Characterise soil, cross-rip and cover with 35-40mm nickel slag, or equivalent; (2) Leave to leach for at least two years; (3) Construct windrows of planting medium and conduct revegetation trials; (4) In the event that revegetation is unsuccessful, cover with waste rock or equivalent, as dust and erosion protection.	Conduct research on methods of rehabilitating the mined tailings dumps, and progressively establish a stable ecological community with landforms resistant to erosion and mobilisation of dust; monitor the success of rehabilitation and develop completion criteria.
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Yours sincerely

L D MANN
Resident Manager - Kaltails Project