Titanium dioxide pigment plant debottlenecking

Tiwest Joint Venture
Proposed changes to environmental conditions

Report and recommendation
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 742
June 1994

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 a proposed change to environmental conditions set by the Minister for the Environment in April 1989.

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 30 June 1994.

Environmental Impact Assessment (EIA)

Process Timelines in weeks

Date	Timeline commences after receipt of full details of proposal from the proponent	Time (weeks)
12/5/94	Proponent Document Released for Public Comment	2
27/5/94	Public Comment Period Closed	
	Issues Raised During Public Comment Period Summarised by EPA and Forwarded to the Proponent	not required
	Proponent's response to issues raised received (proposal amended at this stage by proponent)	not required
13/6/94	EPA reported to the Minister for the Environment	

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Summary and recommendation

The Tiwest Joint Venture (TJV), the proponent, proposes to increase the production of finished titanium dioxide pigment at its Kwinana Pigment Plant. The Tiwest Joint Venture has requested changes to Condition 1 of the Ministerial Statement of 26 April 1989, relating to the Pigment Plant. Condition 1 restricts the original plant to 54,000 tonnes per annum of finished titanium dioxide pigment, as assessed by the Environmental Protection Authority in Bulletin 373. The proponent now proposes to undertake a "de-bottlenecking" process so that the plant can be rated to 64,000 tonnes per annum of finished titanium dioxide pigment.

The major environmental issues associated with the titanium dioxide pigment plant relate to the storage and production of hazardous substances and the potential off-site risk to other industries, residences and recreational areas. These include discharges of sulphur dioxide and other sulphur compounds, and potential off-site releases of titanium tetrachloride and chlorine.

The Department for Environmental Protection (DEP), on behalf of the Environmental Protection Authority, sought comment from government departments including the Department of Minerals and Energy and the Health Department of Western Australia, the Town of Kwinana and community groups and individuals during the assessment of this proposal.

After consulting with all relevant levels of the community, no advice, technical or otherwise, was presented to the Environmental Protection Authority which would suggest that this proposal, if implemented, has the potential to cause any unacceptable environmental impacts.

The Environmental Protection Authority considers that it is environmentally acceptable to de-bottleneck the existing Kwinana Pigment Plant and concludes that there would be no overall increase in individual and cumulative risk or off-site impact. The Environmental Protection Authority recommends Environmental Condition 1 of the Minister's Statement, issued on 26 April 1989 (Appendix 1), be amended to permit the Tiwest Kwinana Pigment Plant to be de-bottlenecked to the proposed annual output of 64,000 tonnes of finished titanium dioxide pigment per annum.

Recommendation 1

The Environmental Protection Authority concludes that the de-bottlenecking of the Tiwest Kwinana Pigment Plant to produce up to 64,000 tpa of finished titanium dioxide pigment is environmentally acceptable and could proceed.

1. Introduction

The Tiwest Joint Venture (TJV), the proponent, formerly known as the Cooljarloo Joint Venture, is a joint venture between Kerr-McGee Chemical Corporation and Ticor Resources Pty Ltd (formerly Minproc Resources Pty Ltd). The joint venture has developed a fully integrated titanium minerals processing project in Western Australia based on mineral sands extracted from the Cooljarloo mine near Cataby. The project consists of:

- a mineral sands mine at Cooljarloo, 170kms north of Perth;
- a dry separation and synthetic rutile plant at Chandala, 60kms north of Perth; and
- a titanium dioxide pigment plant at Kwinana, 40kms south of Perth (Figure 1).

Each of the above operations has been subject to a formal assessment by the Environmental Protection Authority (EPA).

The TJV integrated mineral sands mining and processing project is subject to a State Agreement in the "Western Australian Government Mineral Sands (Cooljarloo) Mining and Processing Agreement Act, No. 68 of 1988".

An Environmental Review and Management Programme (ERMP) was released for the Kwinana Pigment Plant in July 1988. The ERMP was assessed by the EPA in its report and recommendations on the proposal (EPA Bulletin 373). In April 1989, the Minister for the Environment issued a Ministerial statement that the proposal by the TJV to construct and operate a 54,000 tonnes per annum (tpa) Titanium Dioxide Pigment Plant at Kwinana, could be implemented. A Works Approval, and subsequently a Licence, were issued to the proponent to construct and operate the works. Operations at Kwinana commenced in 1991.

This present proposal is a request to change an environmental condition which restricts the maximum production of titanium dioxide pigment at the Kwinana plant.

Pursuant to Section 46(1) of the Environmental Protection Act, the Minister for the Environment has requested the EPA to inquire into and report on the proposed change to Environmental Condition 1. This report fulfils that request.

Concurrent with this Section 46(1) assessment, the proponent is preparing a Consultative Environmental Review (CER) to upgrade production capacity to 80,000 tpa. The CER will be released for a four-week public review period at some future time.

2. Method of assessment

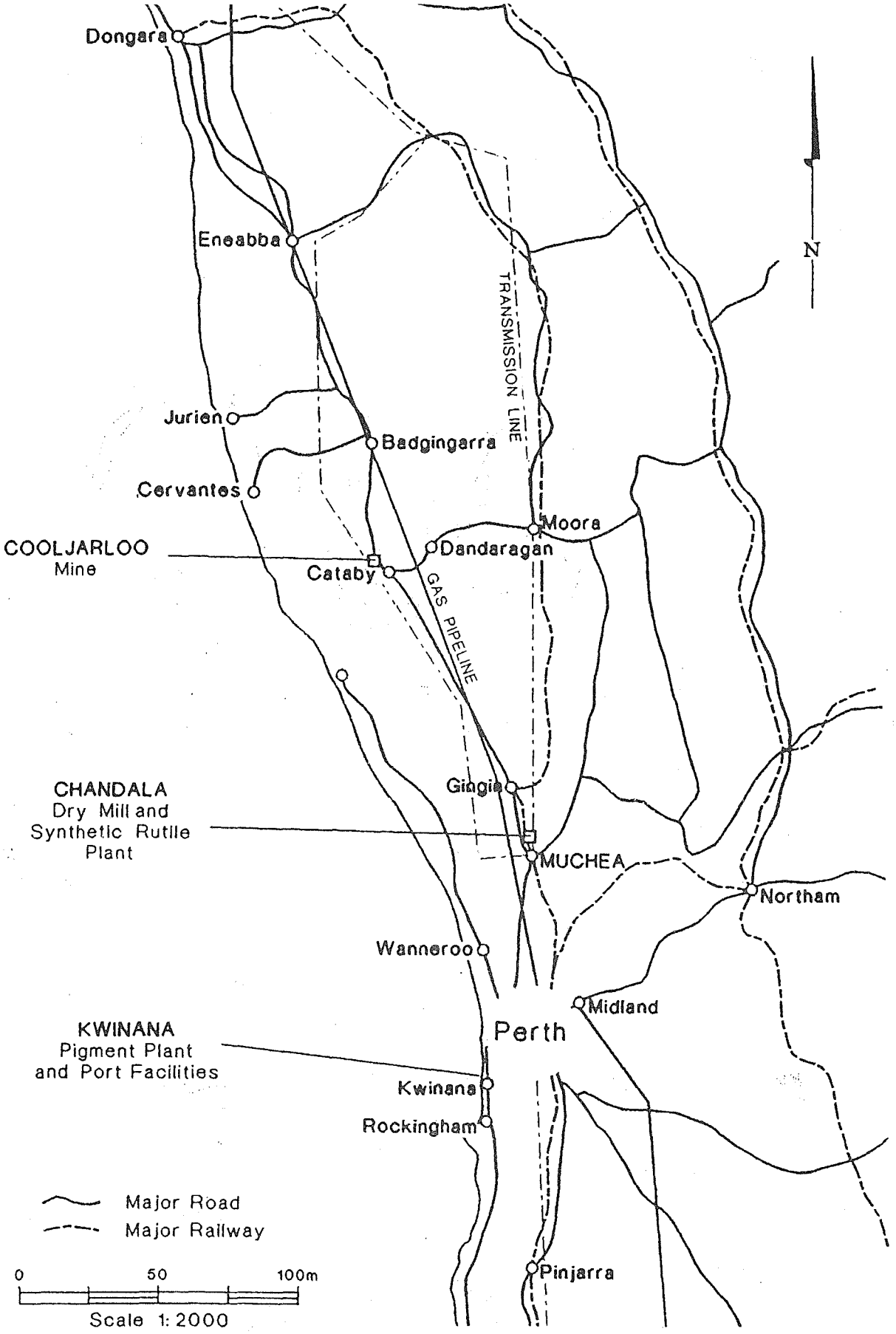
2.1 The proposal

The Tiwest Joint Venture has requested changes to Environmental Condition 1 of the Minister for the Environment Statement of 26 April, 1989. Condition 1 restricts the original Pigment Plant to 54,000 tpa (EPA Bulletin 373, February 1989). The proponent now proposes to implement a "de-bottlenecking" programme so that the plant can produce 64,000 tpa of finished titanium dioxide pigment.

The de-bottlenecking proposal calls for upgrading and modifications to various areas of the plant, namely: the Primary Waste Gas Incineration System, the "Snake Scrubber System ", and the Bulk Storage and Bagging Area.

- **Primary Waste Gas Incineration System**

  Under normal plant operating conditions, all chlorinator process waste gases pass through the Primary Waste Gas Incinerator (PWGI), the waste heat boiler, venturi scrubber and sulphur dioxide scrubber before venting to the atmosphere via the main stack.



TIWEST JOINT VENTURE

COOLJARLOO, CHANDALA AND KWINANA LOCALITY MAP

FIGURE 1

Under certain plant operating conditions, the steam capacity of the waste heat boiler is exceeded, and under these conditions it is necessary to "load share". Under the load sharing arrangement, part of the waste gas stream is diverted to the Standby Thermal Oxidiser (STO) before venting to the atmosphere. The STO does not have a venturi or sulphur dioxide scrubber, hence sulphur dioxide discharges increase during load sharing.

It is proposed to increase the waste heat boiler capacity of the PWGI System, to reduce the current practice of load sharing.

- **Snake Scrubber System**

  The purpose of the Scrubber System (referred to as a "Snake Scrubber System") is to reduce fugitive emissions of chlorine and titanium tetrachloride. Fugitive emissions are drawn via a vacuum system from throughout the plant and treated at a central location. The existing scrubber system is currently operating with reduced efficiency due to build-up of lime solids within the scrubber. Removal of the scrubber system from service for cleaning would require extended plant shutdown and loss in production. As part of the de-bottlenecking, Tiwest proposes to install a new Snake Scrubber System. The capacity of the new Snake Scrubber System will be significantly higher than the system already in operation. Essentially, one of the scrubber systems should always then be on standby.

- **Bulk Storage and Bagging Area**

  The current production system is limited by a lack of flexibility to store finished products in bulk bags or smaller paper packs. It is proposed to double the capacity of the bulk storage and bagging area by installing a new 50 metric tonne bulk bagging silo for filling bulk bags. Separate baghouse filters are proposed for the silo and bulk bags to reduce the discharge of dust from the filling area. Efficiency of the filter systems would be determined by the use of pressure drop indicators to detect bag leakage or congestion.

2.2 Data collection

The major environmental issues associated with the titanium dioxide pigment plant relate to the storage and production of hazardous substances and the potential off-site risk to other industries, residences and recreational areas. These include discharges of sulphur dioxide and other sulphur compounds, and potential off-site releases of titanium tetrachloride and chlorine.

The data base and technical information used in this assessment were those presented with the proposal and as released for public review. Additionally, technical information relating to sulphur dioxide discharge limits were obtained (Tiwest, 1988; EPA, 1992) and compared to summaries of monitoring data (Tiwest, 1993).

2.3 Advice from interested parties

The Department for Environmental Protection (DEP), on behalf of EPA, sought comment from government departments, local government, community groups and individuals which provided submissions during the assessment of the original ERMP. Two of the principal technical advisers to the DEP on this and the previously assessed proposal are the Department of Minerals and Energy (DOME) and the Health Department of Western Australia (Radiological Council). These departments reviewed the technical design specifications for the plant and worker safety aspects respectively. During the review, they had direct discussions with the proponent on all relevant technical aspects of the proposal.

3. Results of EPA's assessment

3.1 Technical advice from government agencies

Advice from the Department of Minerals and Energy (DOME) support the de-bottlenecking proposal. The submission states that the DOME "..... is of the opinion that the revised

proposal of 64,000 tpa is within the EPA risk criteria as outlined in Bulletin 611". Bulletin 611 (EPA, 1992) outlines the EPA's criteria for the assessment of the fatality risk acceptability of proposed hazardous industrial developments. The Bulletin also states the individual fatality risks acceptable to the EPA for residential, non-industrial activities located in buffer zones, and sensitive developments such as hospitals and schools.

The Radiological Council of the Radiation Health Section, Health Department of Western Australia, has requested that an updated Radiation Management Plan (RMP) be produced to reflect the radiological impact of the increased production. An RMP was originally produced by TJV (Environmental Condition 18, Appendix 1) to address the potential radiological impact of the disposal of solid and liquid wastes containing radionuclides. Whilst the Radiological Council had no objections to the proponent's proposal, it advised DEP that an updated RMP should be prepared by the proponent in the near future. The TJV have committed to updating the RMP during the preparation of the Consultative Environmental Review (Tiwest, *pers. comm.*), and this is supported by the EPA.

The practice of "load sharing" was not addressed in the original ERMP for the pigment plant, or in subsequent approvals for this project. The DEP has advised Tiwest that load sharing does not follow the principles of "best practice", and is not recommended, except for periods of planned maintenance or emergency conditions. Increasing the boiler capacity of the existing Waste Gas Incineration System should ensure that load sharing is reduced and the level of sulphur dioxide discharges experienced under load sharing conditions should also be reduced.

The EPA understands that any increases in atmospheric sulphur dioxide discharges from de-bottlenecking would be within current EPA Licence conditions for the plant.

The installation of a new Snake Scrubber System should improve the collection efficiency of fugitive discharges of titanium tetrachloride and chlorine (Tiwest, *pers. comm.*). This is advantageous, as off-site releases of titanium tetrachloride and chlorine were identified as a problem during the commissioning and first year of operation of the plant (Tiwest, 1992 and 1993).

The DEP has advised the EPA that the environmental performance of the pigment plant has improved markedly since start up. Earlier problems concerning off-site titanium tetrachloride releases to the atmosphere and surrounding industries appear to have been largely overcome. There were no off-site discharges of titanium tetrachloride or chlorine in 1993 (Tiwest, 1993).

3.2 Advice from local government

The only relevant Local Government agency is the Town of Kwinana. In its submission, the Town of Kwinana advised that "the Town of Kwinana has no objections to the upgrading of the existing facility as outlined in the proposal".

3.3 Comments from members of the public

Whilst comments were sought from the public, no submission was received.

4. EPA's conclusions and recommendations

4.1 Conclusions

After consulting with all relevant levels of the community, no advice, technical or otherwise, was presented to the EPA which would suggest that this proposal, if implemented, has the potential to cause a significant environmental impact. Notwithstanding that, the EPA, upon advice from the Radiological Council, considers that an updated RMP should be prepared. Accordingly, the EPA advises that it would be appropriate for the proponent to enclose an RMP in the CER to upgrade production capacity to 80,000 tpa at its Kwinana plant.

The EPA considers that it is environmentally acceptable to de-bottleneck the existing Kwinana Pigment Plant and concludes that there would be no overall increase in individual and cumulative risk, or off-site impact.

Atmospheric sulphur dioxide discharges will be within EPA Licence limits for the plant and within air quality standards for the Kwinana area (EPA, 1992b).

The EPA recommends Environmental Condition 1 of the original Minister's Statement on this proposal issued on 26 April 1989 (Appendix 1) be amended to permit the Tiwest Kwinana Pigment Plant to be de-bottlenecked to the proposed annual output of 64,000 tonnes of finished titanium dioxide pigment per annum.

Recommendation 1

The Environmental Protection Authority concludes that the de-bottlenecking of the Tiwest Kwinana Pigment Plant to produce up to 64,000 tpa of finished titanium dioxide pigment is environmentally acceptable and could proceed.

4.2 Recommended amended environmental conditions

The above recommendation could be given effect through an amendment to the Minister's Statement on the original proposal, issued on 26 April 1989 (Appendix 1). The EPA recognises that since the Minister's Statement was issued for the original plant, the Minister now includes a number of standard conditions and procedures not currently reflected. Accordingly, the EPA advises that the original statement be amended to reflect, not only the recommended change in section 4.1 above, but also the standard conditions.

These conditions would allow for non-substantial amendments to the environmental conditions be undertaken by the Minister for the Environment on advice of the EPA. Additionally, the issue of ongoing environmental performance could be addressed through the inclusion of conditions and procedures which require the proponent to prepare periodic "Progress and Compliance Reports". These reports would provide the EPA with an up to date view of the project status and compliance with environmental conditions. Such reports would be publicly available and could be used to demonstrate the proponent's commitment to the environmental issues. The procedures define clear protocols for the on-going assessment of the project.

Accordingly the EPA concludes that the environmental conditions within the Ministerial Statement, set on 26 April 1989, should be amended as follows:

PROPOSAL:	TITANIUM DIOXIDE PIGMENT PLANT, KWINANA (EXCLUDING THE CHLOR-ALKALI PLANT AND THE AIR SEPARATION PLANT) (175A/867)
CURRENT PROPONENT:	TIWEST JOINT VENTURE
CONDITIONS SET ON:	26 APRIL 1989

Condition 1 is amended to read as follows:

1A Proponent Commitments

The proponent has made a number of environmental management commitments in order to protect the environment.

In implementing the proposal, including the modification to allow an increase in production to 64,000 tpa of finished titanium dioxide pigment, as reported on in Environmental Protection Authority Bulletin 742, the proponent shall fulfil those commitments applicable to the Pigment Plant made and listed in Appendix 2 of

Environmental Protection Authority Bulletin 373, provided that the commitments are not inconsistent with the conditions or procedures contained in this statement. (A copy of the commitments is attached).

1B Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

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 after condition 23:

24 Compliance Auditing

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

24-1 To help verify environmental performance, the proponent shall prepare periodic Progress and Compliance Reports 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.

5. References

Environmental Protection Authority (1989), "Titanium Dioxide Pigment Plant Kwinana, Cooljarloo Joint Venture, Report and Recommendations of the Environmental Protection Authority", Bulletin 373. Environmental Protection Authority, Western Australia.

Environmental Protection Authority (1992a), Criteria for the assessment of risk from industry, Bulletin 611. Environmental Protection Authority, Western Australia.

Environmental Protection Authority (1992b), Development of an environmental protection policy for air quality at Kwinana, Bulletin 644. Environmental Protection Authority, Western Australia.

Maunsell and Partners Pty Ltd (1988), TIO2 Corporation and Kerr McGee Corporation Joint Venture, Titanium Dioxide Pigment Plant at Kwinana, Environmental Review and Management Programme, vol 1.

Tiwest Joint Venture (1992), Triennial Report 1989-1991. Tiwest Joint Venture.

Tiwest Joint Venture (1993), Annual Report 1993, Pigment Plant. Tiwest Joint Venture.

Appendix 1

Minister's statement of 26 April 1989 including the proponent commitments

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MINISTER FOR EN.....

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

Titanium Dioxide Pigment Plant, Kwinana
(excluding the Chlor-alkali Plant and
the Air Separation Plant)

Cooljarloo Joint Venture

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 those commitments applicable to the Pigment Plant made and listed in appendix 2 of EPA Bulletin 373 (copy of commitments attached).

2. The proponent shall include in the Environmental Management Programme required under condition 20, a plan to minimise construction stage impacts, including noise, dust from site works and site run-off, to the satisfaction of the Environmental Protection Authority before construction begins.

3. The proponent shall not allow any unacceptable environmental impacts resulting from, for example, air emissions or effluent discharge, during start-up of the plant. The proponent shall include in the Environmental Management Programme details of management provisions which will be used to minimise start-up impacts. This programme shall be to the satisfaction of the Environmental Protection Authority before commissioning.

4. The proponent shall include in the Environmental Management Programme a comprehensive hazard identification and risk management programme to the satisfaction of the Environmental Protection Authority on advice from the Department of Mines.

Published on

26 APR 1989

7th Floor, May Holman Centre,

Phone (09) 325 4133

The comprehensive hazard identification and risk management programme shall include, but shall not be limited to, the following:

(1) safety engineering design;

(2) quantified risk assessments;

(3) hazard and operability studies (HAZOP) of the facilities;

(4) implementation systems; and

(5) safety reviews during the life of the plant.

The on-going results shall be forwarded to the Environmental Protection Authority for assessment and to the Department of Mines.

In the event that the Environmental Protection Authority finds that the results of the programme are unacceptable, the proponent shall modify the process and/or operations as required.

5. From design to decommissioning the proponent shall:

(1) maintain the process equipment, instrumentation and alarm systems consistent with the safety and reliability assessment of the plant; and

(2) install very high integrity instrumentation for the control of the plant and for the detection of and response to any unplanned releases;

to the satisfaction of the Environmental Protection Authority on advice from the Department of Mines.

6. Prior to commissioning, the proponent shall develop and implement, to the satisfaction of the Environmental Protection Authority and other relevant agencies, a plant emergency plan which takes into account all relevant events, including "plant upset" conditions. This plan shall be fully integrated with the requirements of the Kwinana Integrated Emergency Management System (KIEMS).

7. During the detailed design stage, the proponent shall examine ways of reducing water consumption and shall submit a report of this examination to the Environmental Protection Authority and the Water Authority of WA for their assessment, prior to commissioning of the plant. In the event of a major water recycling project commencing in the Kwinana area, the proponent shall utilise the recycled water produced if required to do so by the Ministers for Environment and Water Resources and the Minister administering the Mineral Sands (Cooljarloo) Mining and Processing Act 1988.

8. The proponent shall treat and dispose of effluents in a manner and to the extent that ensures the protection of the beneficial uses of the receiving waters outside the defined mixing zones, and to the satisfaction of the Environmental Protection Authority. Currently the criteria for this protection are those contained in "Water Quality Criteria for Marine and Estuarine Waters of Western Australia". (Department of Conservation and Environment, Bulletin 103, April 1981).

9. At least six months prior to commissioning, the proponent shall prepare and implement a monitoring programme of physical, chemical and biological parameters of the effluent and the receiving waters. This monitoring programme shall include regular reporting of results to the Environmental Protection Authority and shall be to the satisfaction of the Environmental Protection Authority.

   If there is any change in the receiving water quality, unacceptable to the Environmental Protection Authority, the proponent shall modify the plant to the satisfaction of the Environmental Protection Authority.

10. Any proposal for discharge via the Cape Peron outfall shall be the subject of assessment by the Environmental Protection Authority.

11. The proponent shall design the plant so that it can be connected into a scheme for integrated management and disposal of liquid effluents from the Kwinana area at a later date, if required to do so by the Minister for Environment.

12. The proponent shall ensure that the quality of groundwater at the proponent's Cooljarloo minesite is protected and that the rehabilitation of the mine is not jeopardised by disposal of solid waste. The proponent shall make a full and detailed assessment of the disposal of the solid residue, paying particular attention to the amount and fate of the dissolved solids in the residue. As part of the Environmental Management Programme, the proponent shall prepare a report on the disposal of the solid residue, to the satisfaction of the Environmental Protection Authority, at least six months prior to commissioning.

    As part of the Environmental Management Programme, the proponent shall report on the performance of the solid residue disposal, and in the event of unacceptable impacts on the groundwater or vegetation rehabilitation, the proponent shall modify disposal practices to the satisfaction of the Environmental Protection Authority.

13. The proponent shall design and operate the plant in a manner which ensures that there shall be no odour of reduced sulphur compounds from the plant detectable in residential areas.

14. As part of the Environmental Management Programme, the proponent shall prepare a fault tree analysis of conditions leading to emissions which may occur during plant upset (notably via emergency vents), to the satisfaction of the Environmental Protection Authority.

If the fault tree analysis indicates that potentially unacceptable emissions may occur, the Environmental Protection Authority may require the proponent to undertake further dispersion analysis of the emissions and subsequently make modifications to the plant.

15. Prior to commissioning and as part of the Environmental Management Programme, the proponent shall submit a report describing the procedures for leak detection and repair within the pigment plant, to the satisfaction of the Environmental Protection Authority.

16. During the detailed design stage, the proponent shall provide details of:

    (1) the characteristics of emitted gas streams;

    (2) the emission control devices; and

    (3) the final emission stack heights and design,

    to the satisfaction of the Environmental Protection Authority.

17. At least 6 months prior to commissioning the pigment plant, the proponent shall prepare and implement the monitoring programme for gaseous emissions and the ambient air environment around the plant, to the satisfaction of the Environmental Protection Authority.

18. The proponent shall monitor radiation throughout the plant and shall also monitor and manage the potential effects of radiation arising from the discharge of liquid effluent and the disposal of solid wastes. Prior to commissioning, the proponent shall prepare a radiation management programme for the proposed plant and for the disposal of liquid and solid wastes. This programme shall be to the satisfaction of the Radiological Council of WA and the State Mining Engineer.

19. To achieve acceptable noise levels the proponent shall:

    (1) incorporate noise control as a fundamental criterion in the design of the plant, and shall ensure that all attenuation measures considered necessary to address the tonality of the plant noise emissions and to meet the noise levels deemed acceptable by the Environmental Protection Authority are incorporated during construction;

    (2) prior to commissioning, include a noise level monitoring programme in the Environmental Management Programme, to the satisfaction of the Environmental Protection Authority; and

    (3) after commissioning, undertake monitoring to determine the effectiveness of the attenuation measures designed and built into the plant, to the satisfaction of the Environmental Protection Authority.

20. The proponent shall prepare, in stages as appropriate, an Environmental Management Programme which deals with specific aspects of the proposal including, but not limited to:

(1) construction and commissioning impacts (see conditions 2 and 3);

(2) reduction in water use (see condition 7);

(3) monitoring of solid waste disposal at the Cooljarloo mine site (see condition 12);

(4) monitoring of the liquid effluent and receiving waters (see condition (9);

(5) detection of leaks in the pigment plant (see condition 15);

(6) air emissions and air quality monitoring (see conditions 14, 16 and 17);

(7) radiation monitoring (see condition 18); and

(8) noise level measurement and control (see condition 19).

The Environmental Management Programme shall include the requirement for submission of brief annual and comprehensive triennial reports to the Environmental Protection Authority and shall be to the satisfaction of the Environmental Protection Authority.

21. The proponent shall be responsible for decommissioning the plant and rehabilitating the site and its environs to the satisfaction of the Environmental Protection Authority.

22. The proponent shall, at least six months prior to decommissioning, prepare a decommissioning and rehabilitation plan to the satisfaction of the Environmental Protection Authority.

23. No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

Bob Pearce, MLA
MINISTER FOR ENVIRONMENT

26 APR 1989

COOLJARLOO JOINT VENTURE

TITANIUM DIOXIDE PIGMENT PLANT

COMMITMENTS

INTRODUCTION

1. The proponent will prepare an Environmental Management Plan (EMP) for the pigment plant site.

   The EMP will include a Hazard and Operability Study (HAZOP) and a Total Hazard Control Plan (THCP). The EMP will be completed and submitted to the Environmental Protection Authority (EPA) prior to the commissioning of the plant.

2. The proponent will prepare a plant emergency procedures plan which will be prepared in conjunction with and, co-ordinated into the proposed Kwinana Emergency Plan. The plan will be prepared and submitted to EPA prior to plant commissioning.

LANDSCAPING

3. The proponent will prepare a landscape and planting programme for the site.

PLANT EMISSIONS

4. The proponent will engage the services of a Manager, Environmental, Health and Safety Affairs, to manage the environmental health and safety concerns of the site.

ATMOSPHERIC EMISSIONS

5. Atmospheric emissions will be maintained to levels and standards agreed with the EPA.

6. An incinerator with a back up combustion chamber will be installed to reduce atmospheric emission of contaminants from the main process vent stack.

7. Fugitive emissions of $TiCl_4$ will be collected by a vacuum pick up system connected to a scrubber system.

WATER

8. Programmes will be established to minimise water usage, including where feasible, recycling of water within the plant circuit.

9. Water circulation systems will, generally, be located over concrete pads or hardstand with collection areas and sumps. Spills will be collected and routed to a neutralisation system to join the plant effluent stream.

10. Stormwater run off will be collected in a surface drain system and disposed of off site.

11. The settling ponds will be lined to prevent leaching of liquids into the groundwater. The ponds will be fitted with an under pond drainage system to intercept any leakage through the lining that may occur.

    Details of the pond design will be included in the EMP.

12. A groundwater sampling and reporting procedure will be detailed in the EMP and submitted to the EPA prior to plant commissioning.

LIQUID EFFLUENT

13. The disposal of liquid effluents may be by either discharge into Cockburn Sound or into the Western Australian Water Authorities, Cape Peron sewerage disposal system.

    The system selected will be to the approval of the appropriate authority and detailed in the EMP.

SOLID WASTE

14. Details of the mine rehabilitation plan, including details for the disposal of the pigment plant solid waste products will be outlined in the mine site EMP to be submitted to the EPA prior to the operation of the Pigment Plant.

15. The proponent will develop transport and disposal methods for the plant solid wastes to the approval of the authorities and will detail the methods to be used in the EMP.

NOISE

16. The proponent is committed to remain within the EPA guidelines for noise emissions. Monitoring of noise levels, during construction and operations will be undertaken on site and off site.

    The results of the monitoring will be reported to the EPA.

    The noise monitoring programme will be developed in consultation with the EPA and detailed in the EMP.

RADIATION

17. Regular checking and reporting to the appropriate authority to ensure that the EPA's guideline levels for radiation levels of uranium and thorium in feedstock, solid wastes, liquid effluent and product are met and maintained.

    Full details of the developed radiation monitoring programme will be included in the EMP.

CHEMICAL STORAGE

18. The bunded area for the pure $TiCl_4$ tanks will be designed to hold 100% capacity of the $TiCl_4$ tanks.

19. The design specification for the $TiCl_4$ tanks will be submitted to the appropriate authorities for approval prior to construction.

20. The capacity of the emergency scrubbers will be sufficient to deal with all possible gaseous leaks from the storage vessels.

DECOMMISSIONING

21. When operations cease and no further use for the site facilities can be identified, buildings and equipment will be dismantled, sold or disposed of. The general plant area will then be cleaned up to a tidy condition.

    Equipment used in the titanium dioxide plant will be checked for radioactivity, and where necessary decontaminated prior to sale or disposal. Cleanup procedures upon project completion date are detailed in the ERMP.