INTERNATIONAL CYANIDE MANAGEMENT CODE
CYANIDE PRODUCTION CERTIFICATION AUDIT

Orica Australia Pty Ltd
Box to Sparge
Ventanilla Transfer Facility
Lima, Peru
Summary Audit Report

Submitted to:
International Cyanide Management Institute (ICMI)
1200 G Street, NW, Suite 800
Washington, DC 20005
UNITED STATES OF AMERICA

Orica Australia Pty Ltd
Level 2, 25 Cantonment Street
FREMANTLE WA 6160
AUSTRALIA

Project Number: 087641086 006 R Rev0
## RECORD OF ISSUE

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision</th>
<th>Format</th>
<th>Company</th>
<th>Name</th>
<th>Copies</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 July 2008</td>
<td>Rev 0</td>
<td>Electronic</td>
<td>ICMI</td>
<td>N Greenwald</td>
<td>1</td>
</tr>
</tbody>
</table>

**Ventanilla Transfer Facility**

Name of Facility: ___________________________  Signature of Lead Auditor: ___________________________

**Date**: 10 July 2008

**Golder Associates**
SUMMARY AUDIT REPORT
FOR CYANIDE PRODUCTION OPERATIONS

Name of Cyanide Production Facility: Box to Sparge Ventanilla Transfer Facility
Name of Facility Owner: Orica Australia Pty Ltd
Name of Facility Operator: Orica Australia Pty Ltd
Name of Responsible Manager: Joe Quagliata
Address: Reid Road via Gladstone, Gladstone
State/Province: Queensland
Country: Australia
Telephone: +61 7 4976 3500
Fax: +61 7 4976 3510
E-Mail: joe.quagliata@orica.com

Location detail and description of operation:
Orica is an Australian-owned, publicly listed company with global operations. Orica is managed as discrete business units that produce a wide variety of products and services. The Mining Chemicals unit is based in Australia and exports products to Asia, Africa and the Americas, as well as supplying the local Australian industry. This unit’s main product is sodium cyanide, which is manufactured at Orica’s Yarwun facility in Queensland, Australia. Orica Mining Chemicals is the world's second largest producer of cyanide.

Orica’s Ventanilla Transfer Facility in Callao, Peru was constructed to supply mine site customers in Peru with cyanide transported within sparge isotanks. The Transfer Facility comprises a purpose-built structure that houses material handling equipment and there are associated facilities (a partly open warehouse protecting sea containers containing boxed cyanide, change rooms, equipment storage, office, ablutions, guard house and yard area) located within the Neptunia S.A. empty container warehouse at Callao.

The Transfer Facility was constructed in 2007 and commissioned with the first isotank batch transfer completed on 6 June 2007.

Cyanide manufactured at Yarwun is the only product handled within the Transfer Facility in Lima, Peru.

Name of Facility Signature of Lead Auditor Date
Ventanilla Transfer Facility Golder Associates 10 July 2008
SUMMARY AUDIT REPORT
AUDITORS FINDINGS

Orica’s Ventanilla Transfer Facility is:

☒ in full compliance with
☐ in substantial compliance with
☐ not in compliance with

The International Cyanide Management Code

Audit Company: Golder Associates
Audit Team Leader: Edward Clerk, CEnvP (112), RABQSA (020778)
Email: eclerk@golder.com.au

Name and signatures of other auditors:

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edward Clerk</td>
<td>Lead Auditor</td>
<td></td>
<td>10 July 2008</td>
</tr>
<tr>
<td>Mark Latham</td>
<td>Technical Specialist</td>
<td></td>
<td>10 July 2008</td>
</tr>
</tbody>
</table>

Dates of Audit:

The audit and reporting was between April and July 2008. The field component of the audit was undertaken over 14 person-days between 14 April 2008 and 18 April 2008.

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Verification Protocol for Cyanide Production Operations and using standard and accepted practices for health, safety and environmental audits.

Ventanilla Transfer Facility
Name of Facility

Signature of Lead Auditor

Golder Associates
Principle 1 – Operations:
Design, construct and operate cyanide production facilities to prevent release of cyanide.

Production Practice 1.1: Design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.

☐ in full compliance with
☐ in substantial compliance with
☐ not in compliance with

Standard of Practice 1.1

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 1.1 requiring an operation design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.

Quality control and quality assurance (QA/QC) programs have been implemented during construction of the Transfer Facility. QA/QC records have been retained for the structures that were assembled locally within Peru and appropriately qualified personnel have reviewed facility construction and provided documentation that the facility has been built as proposed and approved.

Full details of (QA/QC) programs implemented during off-site fabrication prior to on-site assembly of the Transfer Facility were not provided by Orica personnel during the audit. In light of this, Orica commissioned a Peruvian consulting engineering firm to undertake an assessment of the facility. The report concluded that the materials of construction were compatible with the handling of cyanide and the continued operation of the Transfer Facility within established parameters will protect against cyanide exposures and releases.

The operation implements a filling procedure that is designed to avoid overfilling of isotanks when transferring from 1100 kg bags to isotanks. The sound procedure in place overcomes the need for interlocks to operate on power failure. The powered systems associated with the materials handling systems are configured to “stay put” as a safe mode if power fails. Operators can readily see whether the transfer hopper has sufficient capacity to hold a bag of cyanoids before introducing it to the hopper for discharge.

The transfer operation is conducted entirely over an area that is sealed with concrete and which includes a pit that acts as secondary containment. This provides effective containment for pipelines as well, though deflection of leaks could be adopted at pipe joints to reduce the risk of personnel exposure. The major elements of the facility transferring cyanide from box...
to bulk at Ventanilla is owned and managed by Orica. It is located on property leased from Neptunia S.A and Orica uses contract labour provided by Neptunia. The risk of the two companies storing incompatible materials is managed by their respective obligations to comply with applicable regulations for the storage of dangerous goods.

**Production Practice 1.2:** Develop and implement plans and procedures to operate cyanide production facilities in a manner that prevents accidental releases.

- [x] in full compliance with

- [ ] in substantial compliance with

- [ ] not in compliance with

**Standard of Practice 1.2**

**Summarise the basis for this Finding/Deficiencies Identified:**

The operation is in FULL COMPLIANCE with Standard of Practice 1.2 requiring and operation develop and implement plans and procedures to operate cyanide production facilities in a manner that prevents accidental releases.

Orica has developed procedures in both English and Spanish that document the requirements for routine and abnormal operations as well as preventive maintenance programs. Change to physical facilities is controlled through Orica Mining Chemicals document management system that is administered in Australia.

Process parameters are monitored with necessary instrumentation. The nature of the operation is such that process instrumentation does not play a critical role in managing the risk of potential exposures and releases.

The Transfer Facility has an environmentally sound procedure to prevent unauthorised/unregulated discharge to the environment of any cyanide solution or cyanide-contaminated water that is collected in a secondary containment area. All water collected in the Transfer Facility secondary containment is pumped into a one cubic metre tank where it is temporarily stored prior to being pumped to rinse the transfer hopper as part of the sparge isotank filling process.

The Transfer Facility has entered into a contractual arrangement for the environmentally sound removal and disposal of packaging waste that is presumed to be contaminated with cyanide.

The arrangements for storage and handling of cyanide ensure that the material is kept securely in a dry location. Procedures and training ensure that storage spaces are ventilated before personnel enter them if there is a risk of HCN gas accumulating.
Orica has retained the services of Kahatt Abogados to advise on applicable requirements of an environmental, health and safety nature applicable to the packaging of cyanide being transported in the relevant jurisdictions of Peru.

**Production Practice 1.3:**  *Inspect cyanide production facilities to ensure their integrity and prevent accidental releases.*

☑ in full compliance with

The operation is

☐ in substantial compliance with Standard of Practice 1.3

☐ not in compliance with

**Summarise the basis for this Finding/Deficiencies Identified:**

The operation is in FULL COMPLIANCE with Standard of Practice 1.3 requiring operation inspect cyanide production facilities to ensure their integrity and prevent accidental releases.

Regular documented inspections are conducted on fortnightly, weekly and batch-wise schedules and these frequencies appear to be appropriate for the items covered. The scope of the inspections is quite comprehensive in relation to the major cyanide release and exposure risks associated with the facility. Inspection frequencies are sufficient to assure that equipment is functioning within design parameters.

Completed documentation identifies specific items observed and includes the date of the inspection, the name of the inspector, and observed deficiencies. The nature and date of corrective actions are documented on the inspection forms.
Principle 2 – Worker Safety:
Protect workers’ health and safety from exposure to cyanide.

Production Practice 2.1: Develop and implement procedures to protect plant personnel from exposure to cyanide.

☑ in full compliance with
☐ in substantial compliance with Standard of Practice 2.1
☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 2.1 requiring an operation develop and implement procedures to protect plant personnel from exposure to cyanide.

Orica has developed procedures for the Transfer Facility that cover worker safety during product loading, maintenance, non-routine and emergency situations.

The Transfer Facility solicits worker input in developing and evaluating health and safety procedures through dialogue between the Off-site Facilities Manager Cyanide and the Transfer Facility Supervisor. The site has also established a suggestions box for employees to make comments on any issue including health and safety procedures.

The Transfer Facility uses personal hydrogen cyanide monitors to confirm that worker exposure to hydrogen cyanide is below the adopted limits. The monitoring equipment is maintained, tested and calibrated per the manufacturers’ recommendations.

The Transfer Facility has identified areas and activities where workers may be exposed to HCN gas or sodium cyanide dust and has demarcated these areas with a blue line. There are defined PPE requirements applicable to entry to the area within the blue line. Signs erected, training materials and Standard Operating Procedures set out requirements for the use of defined PPE.

Jobs are designed so that operations considered potentially hazardous are not undertaken by lone workers. Arrangements are in place to ensure that workers can communicate their need for assistance if there is an incident during high risk activities.

The Transfer Facility does assess the health of employees to determine their fitness to perform their specified tasks prior to commencing employment.
Areas and activities with specific PPE requirements have been identified. The Transfer Facility has a formal clothing change policy for employees, contractors and visitors to all areas with the potential for cyanide contamination of clothing, but implementation of this policy is still being improved.

The Transfer Facility prohibits personnel from smoking, eating and drinking, and having an open flame in areas with the potential for cyanide exposure.

**Production Practice 2.2:** Develop and implement plans and procedures for rapid and effective response to cyanide exposure.

- [x] in full compliance with
- [ ] in substantial compliance with
- [ ] not in compliance with

**Standard of Practice 2.2**

*Summarise the basis for this Finding/Deficiencies Identified:*

The operation is in FULL COMPLIANCE with Standard of Practice 2.2 requiring an operation develop and implement plans and procedures for rapid and effective response to cyanide exposure.

The operation has developed specific written emergency response documentation for the Transfer Facility.

Showers, low-pressure eye wash stations and non-acidic fire extinguishers are located strategically throughout the Transfer Facility. Safety eye wash stations are used for mouth rinsing in the event of contamination. Water bottles were not installed due to a concern that the bottles may be used for drinking purposes. Safety eye wash stations are to be used for mouth rinsing in the event of contamination. The eyewash and shower stations are supplied by a designated water supply tank and pump.

The Transfer Facility has bottled oxygen with a valved mouth piece, cyanide antidote kits and radios to communicate in emergency situations. Procedures are in place to regularly test and maintain emergency response equipment as well as fire extinguishers, antidote kit contents and first aid equipment.

Material Safety Data Sheets (MSDS) and first aid procedures on cyanide safety are in the language of the workforce (Spanish) and are available to workers in the Transfer Facility, though not located in the cyanide handling areas.

All procedures including the MSDS are located in a file in the Transfer Facility office and all employees at the Transfer Facility have access to the file.

**Ventanilla Transfer Facility**

**Name of Facility**

**Signature of Lead Auditor**

**Date**

Golder Associates
Storage tanks, containers and piping containing cyanide are clearly identified to alert workers of their contents and direction of flow.

All visitors and Transfer Facility Workers receive an induction (with detailing information about the danger of cyanide, risks at the Plant and safety information in general including cyanide exposure procedures. At the completion of the induction, a Hazards Notification letter is signed after which the person is issued with a pocket guide that supports the information provided at the induction.

The Transfer Facility has a procedure detailing the necessary response to cyanide exposure for all workers and visitors to the facility as well as procedures to transport exposed workers to locally qualified, off-site medical facilities. The Transfer Facility does have on-site capability to provide first aid assistance to workers exposed to cyanide as all workers are trained in First Aid, administering oxygen and amyl nitrite.

The Transfer Facility has formally notified local hospitals of the potential need to treat patients for cyanide exposure. The operation is confident that alerted local hospitals have adequate, qualified staff, equipment and expertise to respond to cyanide exposures.

Mock emergency drills are conducted periodically to test response procedures for various exposure scenarios.

Ventanilla Transfer Facility

Name of Facility

Signature of Lead Auditor

Date

Golder Associates
**Principle 3 – Monitoring:**

**Ensure that process controls are protective of the environment.**

**Production Practice 3.1:**  *Conduct environmental monitoring to confirm that planned or unplanned releases of cyanide do not result in adverse impacts.*

- in full compliance with

**The operation is**

- in substantial compliance with
- not in compliance with **Standard of Practice 3.1**

**Summarise the basis for this Finding/Deficiencies Identified:**

The operation is in FULL COMPLIANCE with Standard of Practice 3.1 requiring an operation conduct environmental monitoring to confirm that planned or unplanned releases of cyanide do not result in adverse impacts.

The Transfer Facility is located along a Callao coastal strip approximately 75 m from the Pacific Ocean. The transfer of solid cyanide from box IBCs to sparge isotanks is a dry process and does not directly generate waste process solution and does not have a direct or indirect discharge to the ocean.

Although the Peruvian Government has established groundwater limits for cyanide, WAD cyanide concentrations are not monitored in groundwater as no actual or designated beneficial use exists and the government has not established a point of compliance for the Transfer Facility.

The Transfer Facility limits atmospheric process emissions of HCN gas, such that the health of workers and the community are protected.

The Transfer Facility has adopted HCN exposure limits of 10 ppm instantaneously and 4.7 ppm continuously over eight hours. All employees working in areas with the potential for HCN generation are required to wear HCN monitors that are set to alarm at 4.7 ppm. Employees are required to leave the immediate area if the alarm sounds. The procedures surrounding the use of PPE are supported through the use of signage and training.

Orica engages a consultant to undertake quarterly ambient air quality monitoring at four locations surrounding the Transfer Facility. The air quality monitoring program is documented and results are compiled and reported to the Municipal Government every three months.

**Ventanilla Transfer Facility**

**Name of Facility**

**Signature of Lead Auditor**

**Date**

**Golder Associates**
Principle 4 – Training:

Train workers and emergency response personnel to manage cyanide in a safe and environmentally protective manner.

Production Practice 4.1:  
Train employees to operate the plant in a manner that minimises the potential for cyanide exposures and releases.

☒ in full compliance with
☐ in substantial compliance with
☐ not in compliance with

Standard of Practice 4.1

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 4.1 requiring an operation train employees to operate the plant in a manner that minimises the potential for cyanide exposures and releases.

The Transfer Facility trains workers to understand the hazards of cyanide and refresher training is periodically conducted. Classroom training materials for cyanide awareness and box to bulk operations have been developed in English and Spanish by Orica. Practical training is provided in the use of the personal protective equipment (PPE) required to carry out tasks safely. The work procedures in Spanish are used as the basis of training in the work methods required to carry out safely carry out the tasks required, though there is a mix of written, verbal and practical delivery of information. Appropriately qualified personnel provide the training.

Training is provided before workers are permitted to undertake their tasks. There is a progression of tasks requiring different levels of training and experience. Cyanide awareness training is evaluated by a written test in Spanish whereas competency in job tasks is evaluated based on the Facility Supervisor’s observations.
Production Practice 4.2: Train employees to respond to cyanide exposures and releases.

☑️ in full compliance with
☐ in substantial compliance with
☐ not in compliance with

Standard of Practice 4.2

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 4.2 requiring the operation train employees to respond to cyanide exposures and releases requiring an operation train employees to respond to cyanide exposures and releases.

Orica trains Transfer Facility workers in the procedures to be followed if a cyanide release is discovered. Inspections of training records and interviews noted that all Cyanide Transfer Facility personnel have been formally trained to the OSHA levels specified within the Contingency Plan as well as a select number of simulations.

The emergency simulations have been formally evaluated with a list of corrective actions developed. The deficiencies identified to date have not required training procedures to be revised.

Training records are maintained by the HSE Manager and a review of training files showed information on the name of the trainer, the date of training, the topics covered, and how the employee demonstrated an understanding of the training materials was recorded.
Principle 5 – Emergency Response:
Protect communities and the environment through the development of emergency response strategies and capabilities.

Production Practice 5.1: Prepare detailed emergency response plans for potential cyanide releases.

☐ in full compliance with
☐ in substantial compliance with  Standard of Practice 5.1
☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 5.1 requiring the operation prepare detailed emergency response plans for potential cyanide releases.

The Transfer Facility has developed a written Contingency Plan, to address potential releases of cyanide that may occur on-site or may otherwise require response. The scope of the Contingency Plan is limited to emergencies with the potential to impact people, environment and property resulting from the operation of the Transfer Facility. The Contingency Plan contains sufficient procedural information specifying actions to be conducted and details of persons responsible to undertake the actions.

The Contingency Plan describes specific response actions, as appropriate for the anticipated emergency situations and use of cyanide antidotes. The Contingency Plan considers minor and major cyanide spills and it details the procedure to limit the spread of releases and control the releases at their source.

Production Practice 5.2: Involve site personnel and stakeholders in the planning process.

☐ in full compliance with
☐ in substantial compliance with  Standard of Practice 5.2
☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 5.2 requiring an operation involve site personnel and stakeholders in the planning process.
The Transfer Facility has involved its workforce and stakeholders in the initial emergency response planning process. Neptunia, the Fire Department of Callao, the Police and the Civil Defense Authority have been provided with documentation of the Contingency Plan and have recently been asked for further input related to their roles in case of an emergency to contribute to continual improvement of the Plan.

Apart from Neptunia S.A who is Orica’s landlord, a logistics provider and the employer of some workers contracted to operate the Facility, the neighbouring communities do not have a designated role within the emergency response procedures.

Orica has a procedure to engage in regular consultation and communication with stakeholders to assure that the Contingency Plan addresses current conditions and risks.

**Production Practice 5.3: Designate appropriate personnel and commit necessary equipment and resources for emergency response.**

- in full compliance with

The operation is
- in substantial compliance with
- not in compliance with

**Standard of Practice 5.3**

*Summarise the basis for this Finding/Deficiencies Identified:*

The operation is in FULL COMPLIANCE with Standard of Practice 5.3 requiring the operation designate appropriate personnel and commit necessary equipment and resources for emergency response.

The Contingency Plan designates primary and alternate emergency response coordinators with explicit authority to commit the resources necessary to implement the Contingency Plan.

The Contingency Plan identifies the Emergency Response Teams and training requirements. It was noted that Emergency Response Team members have been fully trained in accordance with the requirements.

The Contingency Plan includes call-out procedures and 24-hour contact information for the coordinators and response team members and clearly specifies the duties for all Emergency Response Team positions.

A list of emergency response equipment is not contained within the Contingency Plan, however a list is held by the Transfer Facility Supervisor. A procedure is in place to inspect emergency response equipment and assure its availability as required to implement the Contingency Plan.
The Contingency Plan clearly describes the role of outside responders (Civil Defence authorities, Callao Fire Department, Police and medical facilities). The special relationship of Neptunia S.A. as landlord and neighbour is identified. Other community entities do not have a designated roles within the emergency response procedures. Orica has confirmed that these stakeholders are aware of their role in the Contingency Plan and is developing arrangements for their regular participation in drills.

**Production Practice 5.4:** Develop procedures for internal and external emergency notification and reporting.

- in full compliance with

The operation is

- in substantial compliance with
- not in compliance with

**Standard of Practice 5.4**

*Summarise the basis for this Finding/Deficiencies Identified:*

The operation is in FULL COMPLIANCE with Standard of Practice 5.4 requiring an operation develop procedures for internal and external emergency notification and reporting.

The Contingency Plan contains clear flow charts describing the call out procedures for emergencies. Management, contractors, emergency response team, outside response providers and medical facilities are included within the flow charts. Duties for all positions and entities listed within the Contingency Plan are clearly described.

The roles of the Civil Defence authorities, Callao Fire Department, Police and medical facilities and relevant contact information have been included within the Contingency Plan.

No community has been identified as likely to be affected by an emergency based on a review of potential releases from the Transfer Facility and the distances involved.

The Contingency Plan notes that Chief Financial Officer is to approve the information to be disclosed to media outlets and third parties.
Production Practice 5.5: \textit{Incorporate into response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.}

- in full compliance with

The operation is

\begin{itemize}
  \item in substantial compliance with \textbf{Standard of Practice 5.5}
  \item not in compliance with
\end{itemize}

\textit{Summarise the basis for this Finding/Deficiencies Identified:}

The operation is in FULL COMPLIANCE with Standard of Practice 5.5 requiring an operation incorporate into response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

The Contingency Plan describes specific, appropriate remediation measures, such as recovery or neutralisation of solutions or solids, decontamination of soils or other contaminated media and management and/or disposal of spill clean-up debris, and provision of an alternate drinking water supply. The Contingency Plan also notes that bottled water would be used as an alternate potable water supply if an emergency warranted it.

The Contingency Plan prohibits the use of chemicals such as sodium hypochlorite, ferrous sulfate and hydrogen peroxide to treat cyanide that has been released into surface water. It also addresses environmental monitoring to identify the extent and effects of a release, including sampling methodologies and parameters.

Production Practice 5.6: \textit{Periodically evaluate response procedures and capabilities and revise them as needed.}

- in full compliance with

The operation is

\begin{itemize}
  \item in substantial compliance with \textbf{Standard of Practice 5.6}
  \item not in compliance with
\end{itemize}

\textit{Summarise the basis for this Finding/Deficiencies Identified:}

The operation is in FULL COMPLIANCE with Standard of Practice 5.6 requiring an operation periodically evaluate response procedures and capabilities and revise them as needed.

The Contingency Plan was developed in accordance with the local legislation requiring the development of a Contingency plan. This legislation requires the Contingency Plan to be modified when there is a material change and fully reviewed every five years. The
Contingency Plan notes that it is required to be updated in the event of a drill and/or emergency if deficiencies are identified during the implementation of the Contingency Plan.

Mock emergency drills are conducted periodically to test response procedures for various exposure scenarios. The Contingency Plan requires simulation drills to be evaluated and a report produced, including a photographic record, chronological record, and final recommendations.

Drills conducted to date have resulted in improvements to the Contingency Plan relating to emergency response equipment and supplies.

GOLDER ASSOCIATES PTY LTD

Edward Clerk
Manager Mining Environmental Services
Lead Auditor

Golder Associates
APPENDIX A

LIMITATIONS