Annexure 4:

Principal Hazard Management Plan – Hazardous Substances

Principal Hazard Management Plan

Hazardous Substances

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Department	**Health and Safety**
Location/Site	Macraes

Approval table

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Document issuance and revision history

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Revision number	Revision date	Section	Page	Description	Effective Date
4	2016	All	All	Critical Control Check Sheet (CCCS) audit identified changes required	Nov 2016
5	2017	All	All	External Audit carried out, CCCS check sheet carried out, Legislation changes updated and externally reviewed	Dec 2017
6 - 7	2019	All	All	Review and edits to align with all PHMP's	Jan 2020
8	Sep 2020	All	All	Update to standard information Addition of Nature of Principal hazard and Critical Control definition Update to new format	Sep 2020
9	Jul 2022	All	All	Review and sign off by SSE	Aug 2022

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1 PURPOSE

The purpose of the Principal Hazard Management Plan (PHMP) is to provide the framework for the management of the identified principal hazard of hazardous substances through a risk-based approach.

This PHMP will reference the documents and processes to be followed to ensure tasks or activities associated with the principal hazard, are conducted in a safe manner.

1.1 Nature of Principal Hazard

Hazardous substances are those that are or have the potential to be explosive, flammable, oxidising, toxic to people or the environment (ecotoxic) or corrosive. Macraes operations uses several hazardous substances to extract and process ore in the processes of gold recovery.

2 SCOPE

This PHMP to all persons in any capacity accessing the Macraes Operation and undertaking work associated with the identified principal hazard.

3 REFERENCE AND COMPLIANCE

Level	Source
Legislation or Guidelines	• Health and Safety at Work Act 2015
	• Hazardous Substance and New Organism Act 1996
	• Resource Management Act 1991
	• Environmental Protection Authority Act 2011
	• Radiation Safety Act 2016
	• Health and Safety at Work (In Mining Operations and Quarrying Operations) Regulations 2016
	• Health and Safety at Work (General Risk and Workplace Management) Regulations 2016
	• Health and Safety at Work (Hazardous Substances) Regulations 2017
	• Radiation Safety Regulations 2016
	• Safe Work Australia hazardous substances Code of Practice
	• EPA - Hazardous Substances Disposal Notice 2017
	• HSNOCOP 47 - Secondary Containment Systems
	• International Cyanide Management Code
	• AS 1940 – 2017 the Storage and Handling of Flammable and Combustible Liquids

Corporate	• OGC-450-STD-005 Integrated Management System Standards
	• OGC-450-GUI-005 Risk Management Guidelines
	• OGC-450-STD-019 Environmental Performance Standards Section 6 Hazardous Materials and Chemical Substances
Site	• MAC-250-RSK-005 Macraes Risk Register
	• MAC-250-SMP-000 Macraes Integrated Management System
	• MAC-253-PCP-000 Emergency Management Control Plan
	• MAC-253-PRO-003 Emergency Trigger Action Response Plans TARPs
	• MAC-253-PLN-003 Hazardous Substances map – Layout of Processing Plant
	• MAC-252-PRO-009 Contractor Management Plan
	• MAC-252-PRO-001 Training Procedure
	• MAC-257-PHM-005 Fire and Explosion
	• MAC-257-PHM-006 Explosives
	• MAC-350-PRO-006 Open Pit Explosives Management Plan
	• MAC-257-PRO-010 Cyanide Management Plan
	• MAC-255-FOR-008 Hazardous Substance Approval Use Form
	• MAC-455-PRO-056 Hazardous Waste, Destruction and Removal from Site
	• MAC-250-PLN-008 Radiation Safety Management Plan

4 RISK ASSESSMENT

Hazardous Substances has not been directly identified as a principal hazard in the Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016, however, OceanaGold (OGL) Macraes has identified it as a principal hazard in accordance with, Part 4, Section 65 (b).

The site risk register is to be reviewed after all significant incidents. Formal risk assessments are to be undertaken where changes to this document affect safety of personnel. Risk assessments are to be conducted according to ***OGC-450-GUI-005 Risk Management Guidelines***.

Reference:

- MAC-250-PRO-005 Macraes Risk Register
- MAC-250-RSK-008 Explosives
- MAC-250-RSK-011 Hazardous Substances

5 MANAGEMENT PLAN

5.1 Equipment Design and Standards

5.1.1 Processing Plant Control System

All equipment within the processing plant that is associated with hazardous substances is controlled by the processing plant Yokogawa DCS (Distributed Control System) this has sensors and automated control philosophy that controls this equipment to reduce the likelihood of exposure.

Reference:

- https://www.yokogawa.com/solutions/products-platforms/control-system/distributed-control-systems-dcs/

5.1.2 Segregated and Secure Storage Facilities

Hazardous substances shall be stored in segregated and secure storage facilities.

The Macraes Operation is set up to secure the operational areas from unauthorised access using boom gates and turnstiles requiring access/identification card access. All other areas are fenced and signed “No unauthorised entry”.

Storage of high hazardous substances and waste are secured through fencing and locked gates/doors. This includes the sodium cyanide, SIBX, sodium metabisulphite, copper sulphate stores and explosive magazines. Only authorized personnel shall have access to the hazardous substance’s areas and vehicles.

Reference:

- https://www.cyanidecode.org/about-cyanide-code/cyanide-code
- MAC-257-PHM-006 Explosives
- MAC-350-PRO-006 Open Pit Explosives Management Plan

5.1.3 Vessel Labelling

Storage vessels for large volumes of hazardous substances always requires storage vessels to be certified and inspected annually by an external provider and have labels identifying the hazardous substance visible.

Storage tanks and piping must be certified and approved for the conditions of use and be made of a suitable material to be impervious to the chemicals stored in them. They are to be routinely inspected and maintained and situated above ground by preference.

Storage areas, rooms, tanks are constructed in accordance with the regulations and applicable Australian/New Zealand Standards.

Reference:

- AS 1940 – Storage and Handling of Flammable Substances and Dangerous Goods.
- Records and Documentation (Section 7)

5.1.4 Bunding

All hazardous substances with low permeability shall be stored in bunded compounds in compliance with AS/NZ standards. Bunding is required to provide recovery of liquids, spill containment and prevention of seepage to waterways.

Reference:

- HSNOCOP 47 - Secondary Containment Systems

5.1.5 Hazardous Areas

Site plans of Hazardous Substances storage areas shall be maintained in line with Health and Safety at Work (Hazardous Substances) Regulations 2017.

Reference:

- MAC-257-PHM-005 Fire and Explosion
- MAC-257-PHM-006 Explosives
- MAC-350-PRO-006 Open Pit Explosives Management Plan
- MAC-256-PCP-000 Emergency Control Plan
- MAC-253-PLN-003 Hazardous Substances map – Layout of Processing Plant

5.2 Procedures and Rules

5.2.1 New or Changing a Hazardous Substance

No hazardous substances may be brought onto an Macraes Operations site without approval. Hazardous substances required for a one-off use must also go through the approval process.

The Principal's Representatives, appointed to manage contractors, must ensure that all hazardous substances to be used by contractors are subject to the Macraes Operations hazardous substances approval process.

Reference:

- MAC-200-FOR-003 Chemical Substance Approval for Use Form

5.2.2 Transportation of Hazardous Substances

The Macraes Operations and their contractors shall handle and transport dangerous goods in accordance with the Land Transport Rule – dangerous goods 2005 (when transported by road), and those substances shall be handled in accordance with the label and SDS directions applicable to that substance.

Reference:

- https://www.nzta.govt.nz/driver-licences/getting-a-licence/licences-by-vehicle-type/transporting-dangerous-or-hazardous-goods/

5.2.3 Disposing of Hazardous Substances

Disposal of hazardous substances shall be in accordance with regulations and directions given on the SDS for the substance. The methods shall also be consistent with Territorial Local Authority waste disposal practices and the EPA Hazardous Substances Disposal Notice 2017.

Reference:

- EPA - Hazardous Substances (Disposal) Notice 2017
- MAC-455-PRO-056 Hazardous Waste, Destruction and Removal from Site

5.2.4 Tracking Substances

Tracking is required for the most hazardous of substances, such as explosives, highly flammable and oxidising substances and some poisons. Macraes mine site has a number of these substances e.g. Cyanide, explosives.

Reference:

- Records and Documentation (Section 7)

5.2.5 Radiation

The Radiation Management Plan details the requirements for where the sources of radiation are used, the testing of radiation presence, and management of storage of radiation sources.

Reference:

- MAC-250-PLN-008 Radiation Safety Management Plan

5.3 Supervision, Monitoring and Review

Supervisors are critical in ensuring workers remain safe while undertaking work. They ensure that the systems, processes and procedures associated with the tasks are followed by reviewing and inspecting all work activities under their control, ensuring workers have the appropriate competencies to undertake the work task and undertaking behavioural based observations.

Contractor management is essential in the implementation of this PHMP and is achieved through the allocation of a Macraes principal representative who is responsible for ensuring all site requirements are met and communicated to the contractor.

Reference:

- MAC-250-SMP-000 Macraes Integrated Management System
- MAC-252-PRO-009 Contractor Management Plan

5.4 Training and Competency

All Macraes Operations personnel shall receive required site-specific skill and knowledge during general and refresher induction training, and ongoing job safety training as per the Macraes site training procedure.

All workers required to undertake work under this procedure shall understand this plan, their roles and responsibilities and the appropriate qualifications for their position.

Reference:

- MAC-252-PRO-001 Training Management Procedure

Trainee	Training Requirement

All Workers (includes contractors)	• All mine workers shall receive required site-specific skill and knowledge during mandatory induction training • Familiarisation with this PHMP • All mine workers affected by the requirements of this plan shall understand the plan and their roles and responsibilities
Workers, Certified Handlers and Supervisors working with hazardous substances	• All the above • Competency training and assessment for transport, handling and storage of hazardous substances including: ○ Reading and interpretation of SDS contents ○ PPE ○ Hazard/Risk control ○ Waste disposal ○ Emergency arrangements and response ○ Disposal of hazardous substances ○ Accounting of hazardous substances

5.5 Fitness for Work

OceanaGold has a strong commitment to ensuring that all workers present fit for work. This includes not being adversely affected by the effects of medication, illegal drugs, alcohol, stress, injury or illness and dehydration. Fitness for Work testing programs are in place at the Macraes Operations.

Reference:

- OGN-450-PRO-001 Drugs and Alcohol
- MAC-252-PRO-003 Fatigue Management Procedure

5.6 Emergency Management

In the event of an emergency, the site Emergency Response Team (ERT) shall be activated according to site procedures. ERT shall manage the initial emergency in accordance to the Emergency Management Control Plan and specific Trigger Action Response Plan (TARP).

Reference:

- MAC-253-PCP-000 Emergency Management Control Plan
- MAC-253-PRO-003 Emergency Trigger Action Response Plans

6 RESPONSIBILITIES AND ACCOUNTABILITIES

Role	Responsibility
SSE	• Must hold the relevant competency requirements as outlined in the Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016 • Appoint all safety critical roles under the Health and Safety at Work (In Mining and In Quarrying) Regulations 2016 • Identify Principal Hazards at the mining operation • Ensure there is a PHMP for each principal hazard identified • Ensure all principal hazards are managed effectively • Approve the management plan and all reviews

	Ensure each PHMP/PCP, associated risk assessment and the site risk register is reviewed at least every two years and after any incident involving the principal hazard or material change in plant
Department Manager	• Must hold the relevant competency requirements as outlined in the Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016 • Supervise the health and safety aspects of the mining operation on every day on which any mine worker is at work Notifiable events are investigated, recorded and reported
Supervisors	• Must hold the relevant competency requirements as outlined in the Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016 • Examination of the work area's as defined in Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016 o Section 220 Record of mine workers underground o Section 221 Shift reports o Section 222 Examination of mining operations o Section 223 Barometer; hygrometer, and thermometer o Section 224 Visits to solitary mine workers • Ensure that the systems, processes and procedures associated with all work are followed by reviewing and inspecting all work activities under their control Ensure workers have the appropriate competencies to undertake the work task
Health, Safety and Training Department	• All audits and reviews are according to requirements as outlined in the Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016 • PHMP's and PCP's are document controlled and available to all mine workers • A training plan is developed and operational to achieve competency for all mine workers
Emergency Coordinator	• Ensure the Emergency Management Control Plan addresses the requirements as set out in the Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016, Subpart 4 – Emergency management
Mine workers	• Must hold the relevant competency requirements for their position as outlined in the Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016 • Follow all OceanaGold Health, Safety and Environment policies and procedures

7 RECORDS AND DOCUMENTATION

OceanaGold uses the on-line safety management system and software INX to record and store safety, health and hygiene and training requirements. Records are stored securely and indefinitely within this facility. The following suites are specific to the type of data stored and managed:

- InControl – Event and incident reporting, action tracking, audits, inspections, task observations, Mine Record Entries and Management of Change
- InControl
  - Stationary Container System Certificates
  - Legislative Requirements for all hazardous substances
- InTuition – Workers training and competency requirements
- InHealth – Worker health monitoring and occupational hygiene monitoring programs.
- Pronto
  - Inventories of substances
  - Tracking records of Cyanide

OceanaGold uses the electronic chemical database ChemAlert to store and record all chemicals and hazardous substances used on site. All products in the ChemAlert system are classified **RED**, **AMBER** or **GREEN** according to the associated hazards and the potential risk of exposure.

Reference:

- ChemAlert is found on the Corporate Health, Safety and Environment SharePoint page

All inspection and maintenance reports are to be held by the relevant department or through Corporate maintenance databases i.e. Pronto.

This document is a controlled document secured within the OceanaGold document control system TeamBinder and published to the site through SharePoint.

Any changes made to this document must be documented in the revision reference.

8 AUDIT AND REVIEW

This PHMP and referenced site procedures, shall be reviewed at least every two (2) years as a minimum or after any high potential incident, operational, Management or legislative change or risk register review. Any review of a PHMP under Regulation 69 must include a review of the risk assessment in relation to the relevant principal hazard.

External PHMP/PCP reviews are conducted every three (3) years as per legislative requirements.

Internal PHMP/PCP audits are conducted according to an audit schedule using an audit template against Legislative, Corporate and site standards.

Changes to this PHMP are to be authorised by the General Manager/SSE.

9 DEFINITIONS

Term	Definition
ALARP	As Low as Reasonably Practicable
Certified Handler	A person who is competent and certified to handle hazardous substances and who has met the requirements of the HSNO (Personnel Qualifications) Regulations 2001 or Health and Safety at Work (Hazardous Substances) Regulations 2017.

ChemAlert	OceanaGold's Chemical Data Base administered by the Health and Safety Officer. It can be used to look up the SDS of a chemical and to track approved chemicals and storage locations at site.
Critical Controls	A single control or control type (group, category) that significantly reduces the likelihood or consequence of a Principal Hazard and/or addresses multiple causes or mitigates multiple consequences of the Principal Hazard.
Dangerous Good	Means substances or articles having the properties described in the Land Transport Rule, dangerous goods 2005 Rule 45001/1 - *Table A: Properties and classification of dangerous goods for land transport*, and substances or articles declared by the relevant authority to be dangerous goods for transport on land; and includes any packaging and empty containers that have been cleaned after containing dangerous goods.
EPA	Environmental Protection Authority
Hazardous Substance	Is the legal term for substances regulated by New Zealand's Hazardous Substances and New Organisms Act 1996 (HSNO Act). Means, unless expressly provided otherwise by Regulations, any substance with one or more of the following intrinsic properties: • Explosiveness • Flammability • A capacity to oxidise • Toxicity (including chronic toxicity) • Corrosiveness • Ecotoxicity, with or without bioaccumulation, or; • Which on contact with air or water (other than air or water where the temperature or pressure has been artificially increased or decreased) generates a substance with any one or more or the properties specified in paragraph (a). • Such substances can readily explode, burn, oxidise (accelerate the combustion of other material) or corrode (metals or biological tissue), and/or be toxic to people and ecosystems (for more information, see hazardous properties). The Act and Regulations control the import, manufacture, or use (including disposal) of hazardous substances (i.e. substances that have hazardous properties).
Hazardous Substance Location	means an area where a quantity of the substance exceeds the relevant quantity specified in table 4 in Schedule 9, table 1 or 2 in Schedule 10, table 1 in Schedule 11, or regulation 13.38 is located for more than 24 hours, in the case of a substance that is not subject to the tracking provisions of Part 19, or 2 hours, in the case of a substance subject to the tracking provisions.
HSNO	Hazardous Substances and New Organisms Act 1996
HSNO Classes	Means one of the classes referred to in the EPA Hazardous Substances (Classification) Notice 2017 • Class 1 – explosives • Class 2 – flammable gases

	• Class 3 – flammable liquids • Class 4 – flammable solids • Class 5 – oxidising substances • Class 6 – substances toxic to people • Class 8 – corrosive substances • Class 9 – substances that are toxic to the environment
Hazardous Waste	Means waste that is— (a) generated by a manufacturing or other industrial process; and (b) reasonably likely to be or contain a substance that meets 1 or more of the classification criteria for substances with explosive, flammable, oxidising, toxic, or corrosive properties under the Hazardous Substances (Classification) Notice 2017
Principal Hazard	Any hazard arising at any mining operation that could create a risk of multiple fatalities in a single accident or a series of recurring accidents at the mining operation
PCP	A document that outlines: a) The systems and processes in place at the mining operation to manage hazards at the operation; and b) The measures that are necessary to manage principal hazards at the mining operation
PHMP	A document that outlines: a) Identify the nature of all principal hazards at any mining operation: b) Set out the measures that will be used to ensure that all principal hazards are effectively managed
Risk	The chance of something happening that will have an impact upon objectives. Risk is measured in terms of a combination of the consequences of an event and their likelihood
Risk Management	The processes and structures that are directed towards identifying and managing risk
SDS **(Safety Data Sheet)**	A document providing information to help users develop correct occupational hygiene and safety procedures and exercise the required degree of care. An SDS: a) identifies the substance and its use b) describes the chemical and physical properties of the substance c) provides health hazard information and precautions for use and safe handling; and d) incorporates all the legislative requirements as well as additional safety information (refer to Section 5.17)
SharePoint	OceanaGold Intranet Page • Macraes – Department level
SSE	Site Senior Executive

TARP	Trigger Action Response Plan
Tracked Substance	Means a hazardous substance described in table 1 or 2 in Schedule 26. A very hazardous substance which must be tracked recording what happens to them from when they were imported into New Zealand or manufactured, through their distribution and transport, to their final use or disposal for example cyanide.
WES	Workplace Exposure Standards