Before a joint hearing of the

Dunedin City Council	**LUC-2016-230 and LUC-2013-225/A**
Otago Regional Council	**RM16.138**
Waitaki District Council	**201.2016.779 and 201.2013.360-1**

Under	the Resource Management Act 1991
In the matter of	applications by Oceana Gold (New Zealand) Limited for resource consents for the Coronation North Project

Statement of evidence of Debbie Clarke for Oceana Gold (New Zealand) Limited

14 October 2016

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Qualifications and experience

1 My name is Debbie Anne Clarke.

2 I am the Senior Environmental Advisor for Oceana Gold (New Zealand) Limited (**OceanaGold**) at the Macraes Gold Project (the **MGP**).

3 I have worked at the MGP since April 1996. In my role I am responsible for site environmental related matters including monitoring, rehabilitation, heritage, ecology, reporting, management plans and ensuring OceanaGold continues to maintain a high standard of environmental excellence and fully complies with all applicable statutory requirements, in order to leave a positive legacy at the end of mine life.

4 I hold a Bachelor of Environmental Science.

Scope of evidence

5 I am a member of the OceanaGold Environmental Team. I have been involved in the implementation and monitoring of the Coronation consent conditions. I have been involved in the Coronation North project from the outset, including co-ordinating consultants, having input into the consent applications, Assessment of Environmental Effects (**AEE**) and our response to requests for further information from the Councils, consultation and site visits with experts and key parties, preparation of proposed conditions of consent and preparation for this hearing.

6 In preparing this evidence I have reviewed the section 42A report prepared on behalf of the DCC and WDC, and the ORC recommending report.

7 On behalf of OceanaGold I will present evidence regarding the environmental mitigation and controls proposed for the Coronation North project, included volunteered conditions of consent. I will discuss environmental management at the site, mitigation measures including rehabilitation, and proposed consent conditions.

Environmental management

8 OceanaGold is genuinely committed to responsible environmental management and achieving full compliance with statutory requirements and consent conditions. Part of my role is to ensure we achieve that at the Macraes Mine. We aim to identify and mitigate all environmental impacts associated with our activities and maintain an environmental management system aligned with leading industry practice.

Hazardous Substances

9 Attached to my evidence at Appendix 1 is a copy of OceanaGold's Emergency Management Control Plan (**EMCP**) and a Health and Safety Managent System – Hazardous Substances, to demonstrate how hazardous substances are responsibly managed at the mine. The WDC/DCC recommending report referred to this EMCP at paragraph 129 and it is correct that the EMCP has not changed appreciably since the Coronation hearing. The EMCP remains appropriate for Coronation North.

Mitigation measures – human environment

Tangata whenua values

10 The maintenance of natural landscapes, protection of waahi tapu and waahi toanga, for taonga species and impacts on the mauri of the land, water and air are all of cultural importance. A Cultural Impact Assessment (**CIA**) has been undertaken by Kai Tahu ki Otago Limited (**KTKO**). We were not certain if the CIA would be available before the hearing so, as we did for the Coronation project, OceanaGold volunteered a review condition to take into account the findings of that CIA. However the CIA has been developed in time to address it in our evidence. OceanaGold's response to the CIA recommendations follow.

11 KTKO express an interest in receiving water quality data and OceanaGold is happy to accommodate that request once it is clarified what information the Runanka would like to receive and how regularly. We will continue to discuss this with KTKO.

12 KTKO have requested a dispute resolution process for any issue arising from a review of the consent conditions. OceanaGold has no issue in principle with the idea that we and the runaka should work in good faith around implementation of actions to address cultural matters in the first instance, and if there was to be an impasse we would agree to a mediation to try to resolve that. However the WDC/DCC recommending report at paragraph 58 suggests this process should be contained in an MOU instead of a consent condition. OceanaGold is happy to propose an informal dispute resolution process with the runaka in an MOU and we have agreed with KTKO to meet and update the MOU.

Culturally important landscape features

13 Previous consultation and assessments undertaken in the vicinity of the Macraes Mine have not identified any culturally important landscape features. Some aspects of the Coronation North project will have an impact on skylines and ridgelines. OceanaGold will be undertaking mitigation in terms of rehabilitation to minimise any potential effects on culturally important landscape features.

Taonga species

14 OceanaGold will undertake appropriate mitigation to minimise effects on the values identified within the Coronation North Project area. Therefore, it is considered that the Coronation North Project will treat taonga species identified in the NRMP sustainably, and with an appropriate level of care.

Sites of significance, waahi tapu, and waahi taonga

15 OceanaGold has commissioned extensive archaeological surveys of its entire project area since commencement of exploration and mining in the area. While it is acknowledged that early Maori could have occupied the area, no evidence of significant interest was found within the footprints of mine infrastructure at Coronation North. A survey of the Coronation North area by Brian Allingham identified 21 potential Iwi sites of interest of which the majority were rock shelters sites. These sites were subsequently test pitted with no Iwi related evidence identified. A feature identified as a possible umu ti was recorded as a pit with its origin not able to be identified as the result of test pitting. This site will be fully investigated under an Archaeological Authority. A possible burial site (also identified as a possible hut site or enclosure site connected to pre 1900 mining activities in the archaeological survey completed by Origin Consultants) identified by Brian falls outside of the Coronation North development area and the waste rock stack boundary has subsequently been modified to avoid this and several other sites by a greater buffer zone.

16 It is therefore unlikely the project will impact on any site of significance. However, it is possible that an unrecorded or unknown site may exist within the area and to that end OceanaGold has an established procedure communicated to all staff on dealing with such accidental discoveries.

Water

17 Mitigation will be undertaken by OceanaGold to ensure that the Coronation North Project operates through to the end of mine life, and in post closure phase, within the proposed compliance criteria for Mare Burn that have been previously accepted by Iwi.

18 The Coronation North Project is not expected to have any discernible effect on flow rates in the Taieri River. Data from Deepdell Creek was used to estimate flows in the Mare Burn due to little or no continuous dataset being available for Mare Burn. The project will have some effect on flows in the Mare Burn as flows will increase during low flow conditions due to discharge of waste from the Coal Creek Freshwater Dam.

Air/Dust

19 The ORC proposed conditions of consent (RM16.138.19) are accepted by OceanaGold. A comprehensive dust management plan exists for the mine and this will be updated to incorporate the Coronation North project activities. Dust mitigation methods and monitoring will be consistent with that currently used at the site, but with a newly located dust monitoring site which will be monitored for the duration of the Coronation North project.

20 Attached to my evidence as Appendix 2 is a letter from Prue Harwood, an Environmental Engineer at Beca Co Ltd. Ms Harwood prepared the report on discharges to air (Appendix 3 to the AEE). OceanaGold asked Ms Harwood to review the O'Connell's submission and she confirmed that the results of monitoring carried out by OceanaGold in the vicinity of the O'Connell property indicate that dust levels are being adequately minimised and maintained within the limits of the current consent conditions.

Heritage

21 The Coronation North area contains a number of heritage sites. No sites are located within the footprint of the Coronation North Pit, roads or infrastructure areas. The proposed Coronation North Waste Rock Stack will disturb a series of water races within Maori Hen Creek. The boundary of the waste rock stack has been modified, (as shown in the plan attached to Mr Dale Oram's evidence) to avoid several sites and to provide a buffer zone for sites identified within Trimbells Gully including a site containing an upright stone slab within an area of rectangular earthworks (suspected to be a miners hut but also recorded by Brian Allingham as part of his survey for Iwi related sites as a possible burial site). The Coal Creek freshwater dam area contains several sites including early alluvial workings and features associated with the New Zealand Gold and Tungsten mine.

22 OceanaGold is in the process of applying for archaeological authorities from Heritage New Zealand Pouhere Taonga (HNZPT) for the sites that fall within the Coronation Waste Rock Stack and Coal Creek Dam footprint. Sites that fall adjacent or just outside the proposed working areas will be clearly identified in the field and on relevant site plans to ensure there will be no physical impact. Sites that will be impacted will be recorded and surveyed by an archaeologist prior to earthworks commencing and in accordance with any conditions of Authority issued by HNZPT. A report on the findings will be prepared and submitted to HNZPT

23 The existing Heritage Management Plan for the mine will be updated and expanded to include the Coronation North area. This will be done in consultation with the Otago office of HNZPT and copies of the updated plan will be provided to HNZPT and Councils.

24 Heritage mitigation has been agreed in principle with the Otago office of HNZPT and will support offsite heritage restoration.

25 An “accidental discovery protocol” will be put in place for work in the Coronation North area. This will be communicated to staff and contractors working on the project. Accidental discovery protocols have been used elsewhere on the minesite wherever there is the possibility of uncovering unrecorded archaeological sites or where there are known or potential historic underground workings.

Landscape and visual

26 I repeat that mitigation measures have been incorporated into the planning for the Coronation North project from the outset, including design of the form of the WRS (in consultation with a landscape architect) to integrate it with existing landform character of the area, progressive rehabilitation, restoration of areas disturbed around the margins of the project, and removal and restoration of haul roads. These methods have been proven as effective in mitigating visual and landscape effects of other WRS constructed at the Macraes Mine.

Noise

27 Mr Hegley will present evidence on noise. I address the topic mainly to confirm that monitoring of noise impacts arising from the Coronation North project will be consistent with what already occurs under consent conditions for Coronation and the wider mine site.

28 I also confirm that the minor changes to condition 9 suggested in the recommending report at paragraph 124 (amend condition 9.1 and insert new condition 9.2) are acceptable to OceanaGold.

29 I also briefly respond to some submissions made on the topic of noise below.

O’Connells

30 OceanaGold undertakes regular noise monitoring in the Macraes Village at a location within about 100m from the O’Connell residence, which makes the results fairly representative of the noise that would be experienced at their home and also at the School House which is several hundred metres to the south of the O’Connell residence. Monitoring undertaken during the daytime on 11 and 25 July, 9 and 19 August, 9 September and 12 October is outlined in Table 1 below. The measurements range from 35dBA L10 to 45.5dBA L10, and are all under the noise level of 50dBA LAeq required by the Coronation North consent conditions.

	MAC-Ray O'Connells - Noise		MAC-School House				
Field	11-Jul-16	9-Sep-16	25-Jul-16	09-Aug-16	19-Aug-16	9-Sep-16	12-Oct-16
Comments	Mine noise clearly audible, Lmax due to farm noise in background, mining FRIM and IM west		wind noise in trees, dogs barking		Mining noise audible, school bell, paused for people talking		Mining noise audible, Lmax due to vehicle
L10 (dB)	35	36.5	41.5	37	43	37.5	45.5
L50 (dB)	30	31	39	33.5	35	30.5	39.5
L95 (dB)	26.5	28.5	36.5	32	29.5	27	36
Lmax (dB)	68.3	60.7	53.6	64.5	56.8	62.2	66.4
Weather Conditions	Frosty, no wind	W wind, 1 m/s, 0% cloud	SW wind 5 plus m/s, 10% cloud cover	No wind, no cloud	Calm, Clear	W wind, 1 m/s, 0% cloud	Overcast, no wind

Blasting

31 The blasting programme and methods that will operate at Coronation North Pit will be similar in nature to that which already operate at the Macraes Gold Project.

32 OceanaGold accepts the conditions of the consent proposed in the WDC/DCC Recommending Report (Conditions 8 and 10), which mirror those that it already

operates under the Macraes Gold Project. They include a restriction on blasting hours, and parameters for blast vibration and air blast overpressure.

33 Vibration and air blast overpressure monitoring will be conducted at Longdale Station and the Howard residence.

Coal Creek Freshwater Reservoir

34 Consent RM16.136.18 specifies that the maximum water impounded in the Coal Creek freshwater dam shall not exceed 685,000m3 at the normal top level. As the design work completed to date is preliminary our dam designer has indicated that the final volume may be more that this and suggests this be changed to 800,000m3 or the condition is worded so as to provide a greater element of flexibility.

35 We recommend the conditions relating to the Coal Creek Freshwater Dam are made more robust and include more detail to provide consistency with similar consents already held for the site, for instance to accord with NZSOLD guidelines. OceanaGold will meet with ORC staff to discuss this prior to the hearing.

Mitigation measures – natural environment

Ecology

36 Dr Ryder and Dr Thorsen will present evidence on aquatic and terrestrial ecology respectively. I mention the mitigation and monitoring that was originally outlined in the consent application, and also mitigation which has subsequently been volunteered by OceanaGold following discussions with key parties.

Mitigation outlined in application

37 The use of silt ponds, other sediment control measures and mitigation to ensure compliance with water quality standards, will minimise any effects of the development on catchment environments with ecological values.

38 In order to avoid risk of transfer nuisance weeds/algae such as didymo to local watercourses wherever possible, equipment and other items used in waterways will be first inspected and if necessary cleaned prior to use.

39 OceanaGold will continue the aquatic biology monitoring programme that has been undertaken to date at the MGP. Quarterly monitoring of macro-invertebrates and periphyton, along with an annual summer electric fishing survey at a series of control and impact sites has been completed since 1990. A flow reading will be completed on each monitoring occasion. All aquatic biology monitoring will be undertaken during low or stable flows. The taxonomic composition and abundances of benthic macroinvertebrates and fish will be recorded, and a

qualitative assessment of the height and percentage cover of dominant species of benthic algae will be monitored. The results of each year's monitoring are compiled into an annual report.

40 Surface water quality monitoring will monitor the effects of the Coronation North project construction and ongoing mining operations on freshwater ecology and water quality. A new water quality monitoring site (MB02) will be created for the Coronation North project, this is located approximately 1km downstream of the existing Coronation compliance monitoring point (MB01) and has been located downstream of all activity and groundwater seepage discharges.

Comment on ORC consent conditions

41 The ORC condition relating to the translocation of aquatic fauna (koura and galaxiids) is differently worded but overall is consistent with the conditions imposed for Coronation.

42 The Recommending Report recommends proposed conditions of consent relating to trout exclusion devices be implemented as conditions of consent on Page 31, however on Page 39 suggests arrangements for payments related to freshwater fauna mitigation be managed outside the consenting process. It is OceanaGold's preference to include the requirements for trout exclusion devices as a consent condition.

Mitigation developed since lodgement

43 OceanaGold has worked with Department of Conservation and KTKO to develop a proposed ecology mitigation package that includes the following (full proposed consent conditions and associated plans are provided in Appendix 3).

44 An Ecological Management Plan for Coronation North will be prepared in consultation with DoC and amongst other matters will provide further detail on the implementation of the mitigation measures listed below. Although the condition does not expressly require consultation with Iwi in fact OceanaGold has done this for previous EMPs and will do so for the Coronation North EMP. KTKO are determining whether Iwi would like to receive a copy of the EMP and we would happily provide it if requested. An annual report on the activities undertaken under the EMP will be prepared and provided to Councils, KTKO and DoC.

45 Protection by conservation covenant of an approximately 289ha of land referred to as "Island Block" and an approximately 83ha of land referred to as Highlay Hill (Plans showing these areas are included in Appendix 3). These areas have been inspected by DoC and Council consultants and contain examples of habitats types that will be lost as part of the Coronation North Project development. The

areas will be fenced as identified on the plans and the Highlay Hill area managed to exclude stock. Pines within the Island Block area will be felled.

46 Material from fifteen rare and threatened plant species located in the Coronation North Project area will be collected and used to propagate twenty plants of each species which will be planted at suitable locations determined in consultation with DoC. Once planted the success rates will be monitored for three years. Annually the area of land to be disturbed in the following 12 months will be surveyed and if any of the fifteen species are located up to 20 plants of each species will be salvaged, planted at suitable locations determined in consultation with DoC and success rates will be monitored for three years.

47 A sum of $30,000 will be made available for an appropriately qualified student to research matters relating to lizard habitat creation and the effects of mining on lizard populations.

48 Ten lizard habitat areas (approximately 10m by 10m or equivalent and with margins planted on fruit bearing plants and tussocks) will be created either surrounding the Coronation North Project area or in and around the margins of the Coronation North Waste Rock Stack. Lizard colonisation of the rock piles will be monitored for a period of five years.

49 In relation to the Coal Creek resource consents provision of $40,000 for trout exclusion devices and their associated maintenance.

Water quality

50 Based on experience from operation the Macraes Gold Project mine site, waste rock stack seepage is likely to demonstrate elevated sulphate concentrations. Without forward planning there is potential to exceed stock water compliance limits in receiving waters over time. There is a need to manage sulphate concentrations in receiving surface water bodies, as sulphate is conservatively transported in water. The construction of a freshwater dam in Coal Creek to supplement low flow periods in the Mare Burn is currently the most appropriate mitigation option. OceanaGold acknowledges that there may be other mitigation options that could be used instead of or in conjunction with the Coal Creek Freshwater Dam that have not yet been fully investigated. Therefore OceanaGold will prepare a “Best Practicable Options” report to address water quality mitigation options that may be utilised together with the Coal Creek Dam or instead of the dam. The report will provide detail on various options and will be prepared with assistance from relevant external experts. OceanaGold will commence preparing the report upon granting of consent and will make the report available to the Councils in a timely manner.

51 Water quality compliance criteria consistent with the existing Coronation project have been proposed for the Coronation North Project with the surface water compliance point being moved from point MB01 to a point approximately 1km downstream called MB02. A review of water quality by NIWA on behalf of the ORC identified a list of compliance criteria substantially different to that proposed. OceanaGold does not accept the compliance limits proposed by NIWA and requests criteria consistent with the existing Coronation criteria and the remainder of the minesite.

Water quantity

52 Surplus pit water from the open pits will be used for dust suppression, irrigated to surrounding farm land, discharged to the Mare Burn under a water quality and flow matching regime or pumped via a pipeline to the Processing Plant or mine water storage facility. This is different to what is described in the ORC Recommending Report on Page 33.

53 Data from Deepdell Creek was used to estimate flows in the Mare Burn due to little or no continuous dataset. Mare Burn is known to be ephemeral and the discharge regime proposed from the Coal Creek Freshwater Dam will result in increased flows during dry periods. The condition proposed by Tonkin and Taylor relating to flow measurement (Page 36 of the Recommending Report) is acceptable in principle, however OceanaGold would like to consult with an experienced hydrologist as to the suitability of MB02 as a monitoring point and suitability of using the average daily 5th percentile low flow.

54 Metering of water takes from the Coronation and Coronation North Pits is acceptable and metering has been undertaken as part of the existing Coronation Pit development.

Water monitoring

55 OceanaGold has an extensive environmental monitoring programme which includes compliance monitoring as required by resource consents and additional in-house monitoring. This same information is also reported to the consent authorities. Monitoring proposed for the Coronation North Project is consistent with monitoring already undertaken at the mine site.

56 Surface water quality compliance points have been established and include a new compliance point called MB02 situated downstream of all activities and potential contaminant discharges.

57 Ground water seepage collection points will be located in the Mare Burn catchment as indicated in Figure 2 of the Compliance and Monitoring Schedule for the Coronation North Waste Rock Stack.

58 The Compliance and Monitoring Scheduled proposed for the Coronation North Waste Rock Stack (as attached to ORC proposed consent RM16.138.09) contains several errors including reference to Compliance Point MB01 (should be MB02). The compliance criteria proposed are the same table as produced by NIWA in their review of water quality and is accompanied by 10 footnotes but no footnote numbers are shown in the table. The list of compliance criteria parameters includes eight that are additional to those in the existing Coronation Schedule and the compliance standards are in general much tighter than those currently in place for the Coronation Project. Of the eight parameters, monitoring for turbidity, suspended solids, nitrate and ammonia are acceptable. The compliance criteria constituents are not consistent with the Surface Water Monitoring constituents. OceanaGold does not accept the proposed compliance criteria.

Rehabilitation

59 The approach taken to rehabilitation for the Coronation North project will generally follow the existing approved Coronation consent conditions. As they are well settled and accepted I have not detailed them in my evidence. However, to summarise the conditions include features like: minimising surface areas disturbed at any one time to the minimum necessary compatible with day to day operations; rehabilitating sites as soon as possible to a safe and stable condition; containing and treating all contaminants on site so that they do not pose a long term safety or environmental hazard; and achieving a sustainable post-mining land use.

60 Rehabilitation is undertaken progressively in order to minimise areas of disturbance. In some instances areas of waste rock stack are left open where the scheduling of the mining operations has not resulted in completion of stages of the stack. Waste rock stacks can only be treated to final rehabilitation where the stack has been built to final design. As part of the mining schedule, these areas will have waste deposited on them at a later date when mining recommences in the respective area.

61 Coronation consent conditions require vegetation on finished areas to be visually integrated into the landscape and for land to be returned to its original productive capacity where appropriate. Planting includes pasture plant species and pockets of native plants (tussock species) at intervals across the WRS surfaces. This approved approach will be continued for Coronation North. We do not plant exotic species that are prohibited by planning provisions (for instance pine species that are prone to wilding).

62 OceanaGold undertakes three yearly rehabilitation reviews which will continue during the Coronation North project.

63 On the completion of mining Coronation and Coronation North Pit will be left to fill as pit lakes. Filling will occur naturally over a long period. Infrastructure associated with mining will be removed and the pit areas fenced. There will be no re-contouring of pit benches and no planting of lake margins due to the considerable time it takes for the lakes to fill and safety considerations. It should be noted that the pit lakes will not be suitable for recreational purposes.

64 OceanaGold does not want timeframes on rehabilitation or more prescriptive conditions imposed due to the need for mining operation flexibility and due to the fact that mining can be influenced by factors beyond our control – e.g. gold price, exchange rates, equipment failures etc. There are financial and bonding implications that incentivise the completion of rehabilitation along with compliance, corporate rehabilitation compliance standards and public perceptions.

65 OceanaGold accepts the rehabilitation consent conditions proposed in the WDC/DCC Recommending Report.

Mine closure

66 The Coronation North Project closure involves completing rehabilitation with pasture vegetation with pocket plantings of native grasses, undertaking such drainage works as will accelerate filling of the Coronation and Coronation North Pit Lakes, construction of an engineered overflow on the Pit rim, re-opening Golden Point Road to the public and rehabilitation of the haul roads leaving a single lane vehicle access track.

67 In-pit backfill options will be evaluated over the life of the Coronation North Project along with economic factors and, where it is viable, will be used to reduce size of the Coronation North WRS. At closure, a pit lake will naturally form in the Coronation North Pit.

68 The WRS will be constructed in such a manner that should it not be constructed to fully consented limits it can be rehabilitated in accordance with the final design slopes and contours proposed.

69 There is one point to be clarified, arising from paragraph 97 of the s42A report for the DCC and WDC. The fleet that will be used to rehabilitate the site will generally be taken from the mining fleet, as it will be better suited to hauling large volumes of rock and topsoil than smaller equipment and will be more efficient.

70 OceanaGold's existing closure obligations in relation to the wider Macraes site will not be changed by this project.

Conditions

71 In the course of preparing the Coronation North application OceanaGold drafted some proposed conditions that were largely the same as those that were approved by the Councils for Coronation. The rationale behind that approach was to ensure a consistent environmental management regime across the entire mine site, including Coronation North, and to apply mitigation measures that already had been approved as promoting sustainable management of resources.

72 Some of OceanaGold's proposed consent conditions were volunteered to the Councils.

73 After lodging this evidence and prior to the hearing OceanaGold intends to liaise with ORC and WDC/DCC staff to discuss variations between OceanaGolds proposed conditions and those accompanying the Recommending Reports. The outcome of this process will be to formulate a tracked changed version of the consent conditions for the convenience of the hearing panel.

Conclusion

74 OceanaGold already operates comprehensive and responsible environmental management, monitoring and reporting practises at Macraes Mine and the Coronation North project will be incorporated within them. The project has been planned and designed with the benefit of expert advice from experienced mining staff and external consultants and will be implemented in accordance with that advice. OceanaGold will adhere to consent conditions, as we already do for existing activity at the mine, and will uphold our good record of compliance.

75 Accordingly, I respectfully request that resource consents required for the Coronation North project be granted to OceanaGold, subject to the conditions of consent we have volunteered.

Debbie Clarke

14 October 2016

Appendix 1 - Emergency Management Control Plan, and Health and Safety Management System – Hazardous Substances

Health and Safety Management System

Emergency Management Control Plan

Document Reference: MAC-253-PCP-000

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Department:	Health and Safety
Location/Site:	Macraes

	Position/Title	Name	Date
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Reviewed by	ER Coordinator, Underground HS&T Coordinator, Open pit HS Officer, UG Production Superintendent, New Zealand Mines Rescue Advisor	Steve Renton, Ian Hunter, Glenda Beijeman, Kevin Patterson, Glenville Styles	25/5/2015
Reviewed by	Senior Sergeant - Southern Police DHQ	Bruce Ross	October 2014
Approved by	SSE	Dale Oram	10/10/2016

	Document Name	Document Reference
Reference Documents	Health and Safety at Work (In Mining Operations and Quarrying Operations) Regulations 2016	Worksafe
	Health and Safety at Work Act 2015	Worksafe
	Operational Risk Register	MAC-251-REG-000
	OGC Corporate Health, Safety, and Environment Compliance Standards	OGC-450-STD-001-07
	Health and Safety at Work (In Mining Operations and Quarrying Operations) Regulations 2016	Worksafe

Document Issue and Revision History

Procedure Name: Emergency Management Control Plan
Document Reference: MAC-253-PCP-000

Revision No.	Revision Date	Section	Pages	Description of Issuance or Revision	Effective Date
1.	Jun 2002	All	All	Draft Upgrade	Jun 2002
2.	Jan 2005	All	All	Upgrade	Jan 2005
3.	Feb 2010	All	All	Update	Feb 2010
4.	Jul 2015	All	All	New Legislation Requirements	August 2015
5.	Jan 2016	All	All	Worksafe underground exercise	Feb 2016
6-10.	July 2016	5,6,7,8,9,10	16-44	Formatting and phone number updates	August 2016
11.	August 2016	Reviewed by	Front page	Included last review by Duneding police and NZ mines Rescue	August 2016
12.	August 2016	Phone Numbers	All	Updated phone numbers	September 2016
13.	Sept. 2016	Headings	All	Formatting	October 2016

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1 INTRODUCTION

1.1 Purpose

The purpose of the Emergency Management Control Plan (EMCP) is to:

- ensure all employees and contractors know how to respond in the event of an emergency
- detail plans and procedures for potential emergencies.
- control or limit any effect that an emergency or potential emergency may have on site, on neighbouring areas or on transportation routes to the mine site
- provide a basis for training and preparedness for all people likely to be involved in any emergency
- control any incident and minimise its effects through the implementation of a coordinated emergency response by trained groups and individuals
- ensure communication of all vital information relevant to an emergency as soon as possible
- facilitate reconstruction and clean-up activities as soon as possible so that normal operations can be resumed
- ensure that the site emergency procedures are developed with due regard to the Health and Safety and Employment Act 1992, Resource Management Act 1991 and associated regulations.

1.2 Scope

The Emergency Management Control Plan is authorised by the SSE and applies to all persons in any capacity accessing Macraes Operation.

The emergency plan must address all aspects of emergency response including ensuring:

- the establishment of a system that enables all persons at the mine to be promptly located
- the provision of adequate rescue equipment, and
- that an adequate number of persons trained in the use of rescue equipment are available (either on-site or on call) if a person is working at the mine

1.3 Definition of an Emergency

An emergency is an unexpected event or series of circumstances that may endanger the health and safety of people and/or impact on the environment and/or cause damage or loss of equipment and production.

An emergency requires immediate actions to be taken to minimise adverse effects.

1.4 Coordinated Incident Management System (CIMS)

1.4.1 A Common / Modular Framework

OceanaGold New Zealand has incorporated the CIMs model for the purpose of an incident or emergency that needs a response from one or more agencies.

The purpose of CIMS is to achieve effective coordinated incident management across responding agencies by:

- establishing common structures, functions and terminology used by agencies in incident management, yet within a framework that is flexible, modular and scalable so that it can be tailored to circumstances specific to any level or type of incident; and
- enabling agencies to develop their own processes, procedures and training for the execution of CIMS.

For the purposes of CIMS, an emergency is defined as a situation that poses an immediate risk to life, health, property, or the environment that requires a coordinated response.

The components of emergency management are referred to as the ‘4Rs’. They are:

- risk reduction
- readiness (to respond)
- response, and

- recovery

CIMS is applied during response, and therefore must be factored into readiness.

1.1 Prevention Strategies

Macraes Operations is prepared for all foreseeable emergencies on site, this is as a last resort, the most effort goes into the prevention strategies to stop the event getting to the stage a full emergency is called. The HSMS details how these strategies are implemented monitored and carried out.

2 MACRAES SITE

The Macraes mine site covers a large area and is separated by the Macraes road. Due to the vastness of the site it is important to describe the exact location of an accident or emergency so that assistance and emergency services can respond quickly.

The Emergency Management Control Plan includes the following areas:

- all pits,
- all dams,
- all roads, parking areas and operational working areas
- all processing areas
- all underground areas,
- all exploration conducted with the Macraes mining lease
- potential to be called to assist to a roads side accident or adjacent incidents/accidents to Macraes lease

2.1 Emergency Priorities

OceanaGold (NZ) Limited is committed to creating and maintaining a safe and productive work environment. If an emergency situation arises the order of priority is:

1. To reduce and eliminate danger to employees and contractors
2. To reduce and eliminate environmental damage
3. To minimise damage to plant and equipment, loss of material and loss of production

2.2 Manning Levels

The number of personnel on site at any given time can vary greatly. The numbers below are indicative of normal numbers expected to be on site at these times.

Daytime Monday - Friday	Night & Weekends	Plant Shutdown Days
200	100	300

2.2.1 Emergency Response Manning Levels

Emergency manning is set up to have a minimum of 6 ER responders on shift at any one time.

Desired department manning levels:

- open pit mining – 2 per shift
- underground 6 per shift
- processing 2 per shift
- other members are made up of day shift employees

3 LEGAL & OTHER REQUIREMENTS

3.1 Legislation

3.1.1 Regulation 104: Consultation with emergency services

When developing an emergency management control plan, the site senior executive must consult—

a) fire, police, and ambulance emergency services that have responsibility for the area in which the mining operation is located; and
b) in the case of a coal mining operation, an underground metalliferous mining operation, or a tunnelling operation where a tunnel is intended to be 150 metres or more in length, the Mines Rescue Trust.

3.1.2 Regulation 105: Emergency management control plan

1. The emergency management control plan must, at a minimum, address the following matters:
   a) the co-ordination and control of emergencies at the mining operation:
   b) the people (or positions) at the mining operation who, or that, will have responsibilities in relation to emergencies at the mining operation, and the detail of those responsibilities:
   c) the events that trigger the activation of the plan:
   d) the use of communication systems in emergencies at the mining operation:
   e) the giving of timely notice, information, and warnings about emergencies to anyone potentially affected by an emergency at the mining operation, including to the persons nominated as next of kin by mine workers:
   f) measures to be taken to isolate an area of the mining operation affected by an emergency:
   g) the availability of the Mines Rescue Trust and other emergency services to respond to an emergency at the mining operation:
   h) the means to locate and account for people at the mining operation in the event of an emergency at the mining operation:
   i) the maintenance of an accurate record of all people underground at a mining operation at all times and their likely location, and the availability of that record for the purposes of responding to emergencies at the mining operation:
   j) the evacuation of the mining operation in an emergency, including the conditions that will prompt withdrawal of mine workers from the mining operation where there is an imminent risk of harm to mine workers:
   k) appropriate transportation from the mining operation:
   l) first-aid arrangements at the mining operation, including first-aid equipment, facilities, and services and the mine workers who are qualified to provide first aid:
   m) provision for all aspects of firefighting, including adequate and compatible firefighting equipment, procedures for firefighting, and training mine workers in firefighting:
   n) a procedure to ensure prompt notification of all relevant emergency services and the Mines Rescue Trust.
2. In the case of an underground mining operation or tunnelling operation, the emergency management control plan must, in addition to the matters in sub clause (1), include provision for ensuring—
   a) there is an effective means of communicating between the surface of the mining operation and any part of the mining operation where people may be located underground; and
   b) the availability of a suitable number of people trained in mines rescue who will be able to respond to an emergency at a mining operation; and
   c) there is adequately maintained equipment at the mining operation that will—
      i. allow for rapid and continuous rescue operations to take place at the mining operation in conditions of reduced visibility and irrespirable and irritant atmospheres; and
      ii. assist the escape or safe recovery of any mine worker or other person from a mining operation where necessary; and
   d) the safe escape of people from underground in the mining operation through conditions of reduced visibility
   e) and irrespirable and irritant atmospheres (including adequately maintained self-rescuers and other facilities to aid escape where appropriate); and

f) there is an appropriate means of escape to the surface part of the mining operation; and
g) the maintenance of an up-to-date plan of—
    i. the exits from the underground parts of the mining operation; and
    ii. the changeover stations and refuges in the underground parts of the mining operation.

3. In the case of an underground coal mining operation, the emergency management control plan must, in addition to the matters in subclasses (1) and (2), include the processes for—
a) safely sealing the whole of the underground parts of the mining operation in an emergency; and
b) the safe use of inertisation equipment.

3.1.3 Regulation 106: Testing of emergency management control plan

1. In addition to the requirements of regulation 69, the site senior executive must ensure that—
a) the emergency management control plan is regularly tested—
    i. using practice drills; and
    ii. involving the services referred to in regulation 104; and
b) mine workers are provided with training in the emergency management control plan and that the provision of this training is recorded.
2. The mine operator must ensure that the mining operation is provided with adequate resources to—
a) effectively implement the emergency management control plan; and
b) keep facilities and equipment regularly inspected and maintained in a fully operational condition.
3. In addition to the requirements of regulation 62, the site senior executive must ensure that a copy of the current emergency management control plan is given to the Mines Rescue Trust, where relevant, and other emergency services referred to in regulation 104.

3.1.4 Underground Mines Rescue Protocol

The purpose of the protocol is to provide high level guidance on managing a level 3 underground mines or tunnel emergency in New Zealand. This includes establishing the roles and responsibilities of stakeholders under the protocol and the lines of authority for decision-making and communication.

The protocol applies to all level 3 underground mine emergencies in New Zealand including emergencies that occur in construction tunnels covered by mining regulations.

The protocol begins when the following four steps have occurred:

- any of the stakeholders under this protocol declare the incident is a level 3 and the MIC, CIE and Police are notified of this declaration;
- the CIE appoints a MIC;
- an LC is established; and
- the EC contacts the MIC to inform them that the LC is operational.

The protocol ends when the MIC informs the EC that the incident has been downgraded to a level 2 incident.

3.1.5 To Activate the Underground Mine Emergency Protocol

When contacting emergency services (111) for a Level 3 event use the following phrase:

"We have a major underground mining emergency at Macraes Frasers Underground mine.

Please activate the Underground Mine and Tunneling Operations emergencies standard operating procedure."

The NZP will then ask further questions to gain more information. It is important to give as much detail as possible, including nature of emergency and numbers involved, unaccounted for, trapped etc.

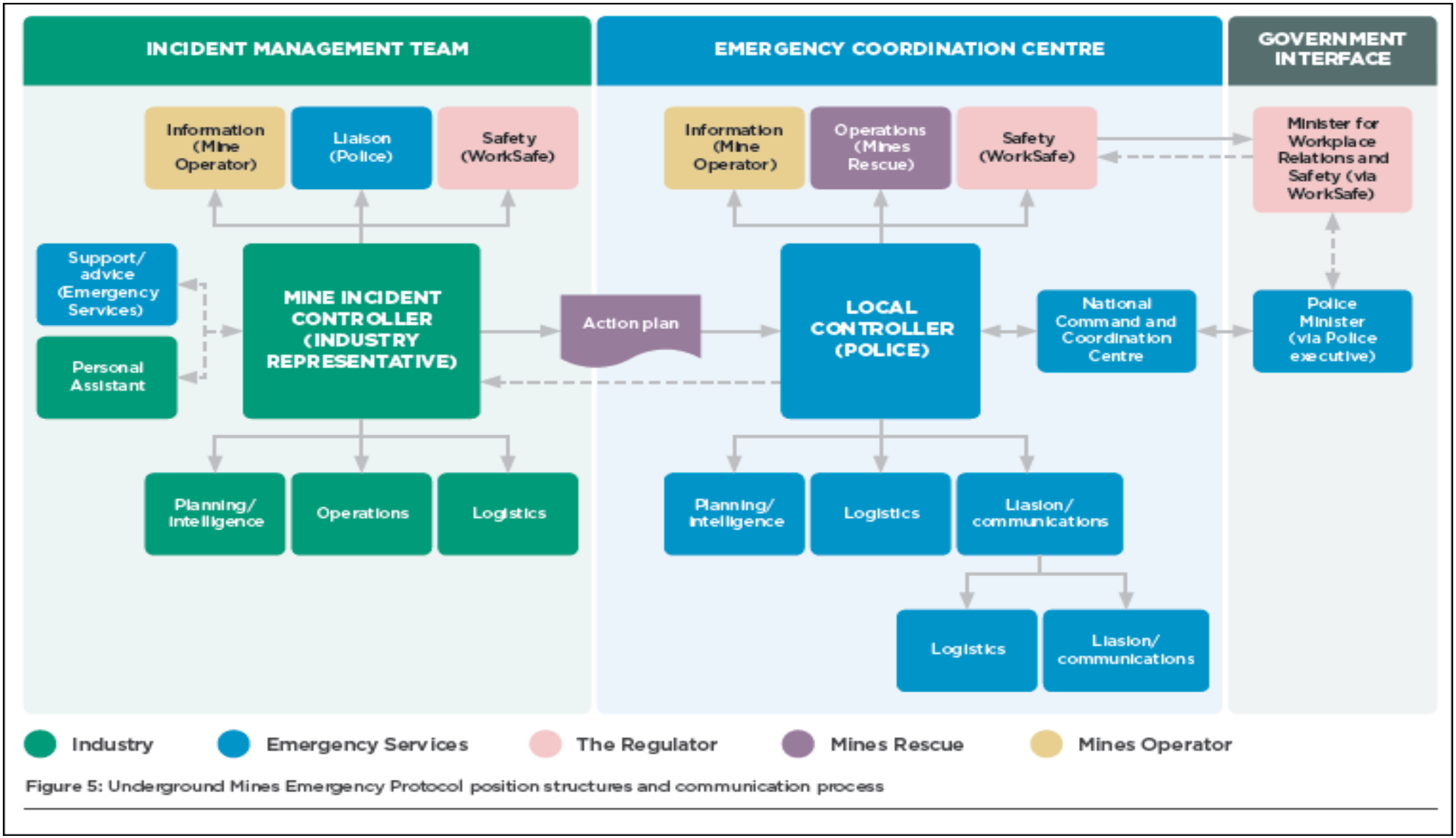


Figure 5: Underground Mines Emergency Protocol position structures and communication process

Figure 1: *IMT and LC Interface diagram*

4 RISK ASSESSMENT

4.1 Risk Assessments Process

A series of risk assessments have been completed for emergency management at Macraes Gold Mine Operation;

- all foreseeable emergencies have been identified and risk assessed with input from technical staff, operational staff, the health, safety committee and the health, safety and training departments
- to mitigate the risks around emergency management associated controls clarified
- for each major event identified there is a corresponding trigger action response plan to show when the incident escalates and what action needs to be taken
- all rescue capabilities were established and documented to ensure the any accident or major incident is responded to safety and efficiently

The following foreseeable emergencies are summarised in the table below:

	Potential incident / accident	Potential location	Internal response required	Casualty management outcome	External services provided
1.	Serious incident / serious on / off site (Including fatality)	all areas	ERT medics, first aid responders, site nurse, IMT initiated, CMT Initiated	burns, personnel trapped behind fire, smoke inhalation entrapment, personnel buried, machinery entrapment	fire, police, ambulance, hospital, rural fire
2.	Multi casualty Incident (Including fatality)	all areas	ERT medics, first aid responders, site nurse, IMT initiated, CMT Initiated	burns, personnel trapped, personnel buried, machinery entrapment, crush injuries	fire, police, ambulance, hospital, rural fire
3.	General Illness	all areas	ERT medics, first aid responders, site nurse, IMT initiated	Sickness, heart attack, medical conditions	fire, police, ambulance, hospital
4.	Fire – surface buildings, bush / vegetation, tyres and or machinery	all surface areas	ERT medics, first aid responders, site nurse ERT fire trucks, water carts, fire extinguishers, IMT initiated	burns, personnel trapped behind fire, smoke inhalation	fire, police, ambulance, hospital, NZ Mines rescue
5.	Fire underground, vehicle, tyres, electrical	Underground	ERT medics, first aid responders, site nurse ERT fire trucks, water carts, fire extinguishers, IMT initiated	burns, personnel trapped behind fire, smoke inhalation, property damage, power outage	fire, police, ambulance, hospital, NZ Mines rescue
6.	Weather event	all areas	ERT medics, first aid responders, site nurse, IMT initiated	multiple casualties, persons trapped, crush injuries, major trauma	fire, police, ambulance, hospital
7.	Tailings impoundment failure	top dam, top-tipperary dam	ERT medics, first aid responders, site nurse, IMT initiated	multiple casualties	fire, police, ambulance, hospital
8.	Mining-vehicle accident (vehicle collision persons trapped)	all areas	ERT medics, first aid responders, site nurse, IMT initiated	personnel buried, trapped in vehicles, personnel isolated	fire, police, ambulance, hospital
9.	Explosives emergency	all areas	ERT medics, first aid responders, site nurse, IMT initiated	personnel trapped, unconscious, inhalation of dangerous fume	fire, police, ambulance, hospital
10.	Major pit wall failure	Surface – open pit	ERT medics, first aid responders, site nurse, IMT initiated, CMT Initiated	personnel buried, trapped in vehicles, personnel isolated head injuries, crush injuries,	fire, police, ambulance, hospital

	Potential incident / accident	Potential location	Internal response required	Casualty management outcome	External services provided
				major trauma incidents, heart attack	
11.	Major strata failure - earthquake	all areas	ERT medics, first aid responders, site nurse, IMT initiated CMT Initiated	personnel buried, trapped in vehicles, personnel isolated head injuries, crush injuries, major trauma incidents, heart attack	fire, police, ambulance, hospital
12.	Entrapment	all areas	ERT medics, first aid responders, site nurse, IMT initiated, CMT Initiated	personnel buried, trapped in vehicles, personnel isolated head injuries, crush injuries, major trauma incidents, heart attack	fire, police, ambulance, hospital, NZ Mines Rescue
13.	Flooding	all areas	ERT medics, first aid responders, site nurse, IMT initiated	Personnel trapped or injured	fire, police, ambulance, hospital
14.	Process plant - chemical spill and/or gas leak	all areas	ERT medics, first aid responders, site nurse, IMT initiated	entrapment, personnel isolated, crush injuries	fire, police, ambulance, hospital
15.	Confined space incident	all areas	ERT medics, first aid responders, site nurse, IMT initiated	drowning, hyperthermia, personnel isolated	fire, police, ambulance, hospital
16.	Explosion	All areas	ERT medics, first aid responders, site nurse, IMT initiated	personnel buried, trapped in vehicles, personnel isolated head injuries, crush injuries, major trauma incidents, heart attack, burns	fire, police, ambulance, hospital
17.	Missing persons	all areas	ERT medics, first aid responders, site nurse, IMT initiated	unable to locate personnel	fire, police, ambulance, hospital
18.	Inundation or inrush	all areas	ERT medics, first aid responders, site nurse, IMT initiated	drowning, hyperthermia, personnel isolated, entrapment	fire, police, ambulance, hospital, NZ Mines Rescue
19.	Violence / Bomb threat	all areas	ERT medics, first aid responders, site nurse, IMT initiated	Security compromised, personnel trapped, injuries	fire, police, ambulance, hospital
20.	Working at Height – suspension trauma/ rescue	all areas	ERT medics, first aid responders, site nurse, IMT initiated	Person/s fall from height and in suspended state with potential for suspension trauma	fire, police, ambulance, hospital

5 OGL CRISIS MANAGEMENT INTERFACE

The interface between this Emergency Response Plan and the Corporate Crisis Management Plan is critical to handling very serious incidents. If incidents grow in complexity and scale, the responsibility for directing the company's overall response may shift to higher levels in the organisation. This escalation in responsibility is necessary because the response may require provision of national or international expertise and equipment, may become the focus of media attention, and may require increased funds and management to address a wider range of environmental, social and economic consequences.

Crisis Management is activated by the Site Senior Executive or Mine Incident Controller when a situation involves or has the potential to involve any of the following;

- threatens the safety, health and wellbeing of our employees, contractors, neighbouring communities or the public at large.
- significantly affect the company's ability to carry out its business
- damage the company's reputation, threatens the environment

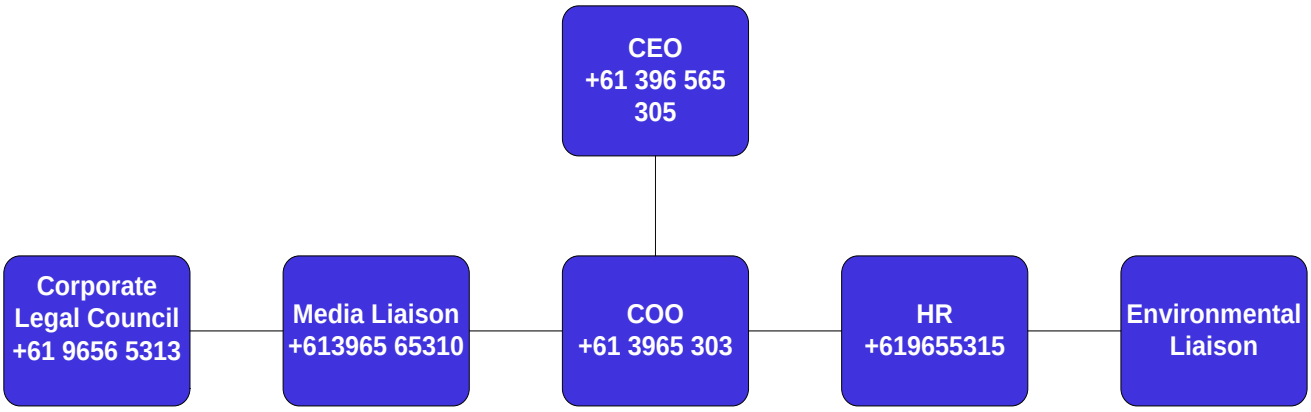


Figure 2: *Crisis Management Team*

5.1 Dunedin

(Chief Development Officer)	4709	+64 3 479 4709 021 244 7905
HELPDESK / ON CALL MOBILE	777	+64 3 479 4777 021 478 776

Senior Corporate Counsel Commercial & Projects

(Snr Corporate Counsel)	4716	+64 3 479 4716 021 396 178

5.2 Corporate – Melbourne

Primary contact #1: m.wilkes	+61 419 372 381
Primary contact #2: m.holmes	+61 427 964 607
Primary contact #3: d.klinck	+1 604 354 3476

6 EMERGENCY MANAGEMENT DOCUMENTS

There are several key documents that form part of the emergency management processes at Macraes Operations. These documents are designed to complement the Macraes emergency management processes. Regular practical and desktop exercises are carried out to make sure all relevant personnel have adequate knowledge of these documents. Each department is expected to carry out two scenarios per year.

The critical documents are outlined below:

6.1 Minestar / Mill Control Emergency Duty Cards - MAC-253-PRO-001

Minestar / mill control duty cards are designed to assist the Minestar controller / mill control operator when taking the emergency call. These clearly outline the process to be followed and personnel to be contacted to initiate the emergency management control plan. All Minestar / mill control operators are to be involved in one mock emergency scenario per year.

6.2 Incident Management Team Duty Cards - MAC-253-PRO-002

Incident Management Team duty cards are designed to assist and prompt members of the incident management team as to what duties need to be carried out in their designated role. A lot of these cards overlap but are essential to provide prompts when placed in potential high pressure situations.

6.3 Emergency Trigger Action Response Plans TARPs - MAC-253-PRO-003

TARPs outline what processes should be followed for specific incidents and what changes as the level of emergency increase.

These documents are specifically designed to assist everyone involved in the emergency to react quickly and decisively. These forms need to be available in key locations such as

- minestar and mill control room
- incident control points
- key external agencies – Police, Fire and Ambulance services

6.4 Police Southern District Macraes Gold Mine - Emergency Action Plan

This document has been developed in conjunction with the Dunedin Police Operations Manager for the Southern District.

The purpose of this plan is to:

- ensure that the New Zealand Police can respond to a variety of incidents which may occur in or around the Macraes mine and mining operations.
- detail plans and procedures for potential emergencies.
- control or limit any effect that an emergency or potential emergency may have on site, on neighbouring areas or on transportation routes to the mine site.
- provide a basis for joint training and preparedness for all people likely to be involved in any emergency.
- control any incident and minimise its effects through the implementation of a coordinated emergency response.

6.5 Emergency Action Plan - Frasers West Explosives Reserve

This Emergency Action Plan (EAP) is one of the main documents of the Safety, Health & Environment System for RedBull Mining Services (RMS) Frasers West Explosives Reserve. It provides an organised, planned and coordinated procedure to be followed in the event of any emergency such as fire, explosion, chemical spill, earthquake, electrical storms, or other natural disasters.

It covers the response required for emergencies that may result from the different processes, areas and activities carried out at RMS Frasers West Explosives Reserve, not only for manufacturing and supplying ANFO and Emulsion but also for storing and delivering the accessories required to perform blasting operations.

6.6 Emergency Action Plan – Tailings Storage Facilities

The purpose of this Emergency Action Plan (EAP) is to safeguard lives and minimise or eliminate damage to property and the environment in the unlikely event of a failure of one of Macraes Operations Tailings Impoundment and/or the Mixed Tailings Impoundment (referred to as the “tailings impoundments”). The tailings impoundments are owned and operated by Oceana Gold NZ Ltd and are located at the Macraes mine site, Macraes Flat, Otago.

6.7 Emergency Action Plan - BOC Oxygen Plant

This Emergency Action Plan (EAP) is one of the main documents of the Safety, Health & Environment System for BOS ltd. Oxygen plant. It provides an organised, planned and coordinated procedure to be followed in the event of any emergency such as fire, explosion, chemical spill, earthquake, electrical storms, or other natural disasters.

It covers the response required for emergencies that may result from the activities carried out at BOC, for storage and supplying of compressed oxygen to the processing plant.

6.8 Corporate Crisis Management Plan

The primary response to an operational emergency/incident will usually occur at an OGC country or Business Unit in line with respective Emergency Response Management Plan/s.

However, in a crisis event / major business interruption, there is invariably a demand for rapid and effective communications with media and stakeholders, commercial and policy decision-making and strategic planning, which is usually beyond the typical resources of country or business unit teams.

This Crisis Management Plan (CMP) is designed to assist in protecting OGC from the corporate consequences of a crisis event, whether sudden (emergency) or escalating in nature, by ensuring prompt and effective handling of the strategic, contractual and public image aspects arising.

Note: All key documents are to be stored in incident control points located across site and stored electronically on SharePoint document library.

6.9 Maps

- MAC-253-PLN-000 Site Emergency Muster and Evacuation Map
- MAC-253-PLN-001 Emergency Coordinates Map

7 INITIATING AN EMERGENCY

7.1 Emergency Calls

7.1.1 By radio

1. State **"EMERGENCY, EMERGENCY, EMERGENCY"**
2. State your name and nature of the emergency
3. Give location of incident, type of incident, number of injured, directions to incident and assistance required.
4. Have message repeated back to you
5. Stay by two-way radio/phone if you are not required at the incident

7.1.2 By Internal Phone –

- dial 911 and follow steps 2 - 5 above.

7.1.3 By Mobile Phone to OGL Emergency Number -

- dial 03 479 4666 and follow steps 2 -5 above.

7.1.4 To external emergency services (if unable to contact Minestar or Mill Control) -

- dial 1-111 from internal phones or 111 from a mobile phone. Answer the operator's questions and do not hang up until told to do so.

7.2 Person discovering an emergency

1. **IMMEDIATELY make** an emergency call, giving the nature and location of the emergency. If you have a two-way radio in your vehicle - USE IT.
2. **DO NOT PLACE YOURSELF IN DANGER**
3. You may decide to take some remedial action, e.g. extinguish a small fire, control bleeding or turn off an energy source.
4. **REMAIN CALM** and assess the situation
5. **ADMINISTER FIRST AID** if required and/or report requirements using the two-way emergency procedure
6. Stay with minestar / Mill control until told otherwise

7.2.1 Response Levels

Each TARP has 3 levels of response:

- level 1 – contact area supervisor – ensure safety of all personnel
- level 2 – contact emergency response coordinator and senior management
- level 3 – contact emergency response coordinator and senior management

Level 1	Level 2	Level 3
Localised response by mine staff with own resources	**Full turnout of ERT team. External support on stand-by or mobilised**	**External assistance mobilised,**
• Injury or incident requiring first aid treatment • No further threat or danger of escalation • Damage affecting and not halting mine operations • Injury or incident requiring personnel to exit mine • Emergency responce informed / on stand by and mobilised if required. • A vehicle incident with no or minor injuries • A minor machinery that has been extinguished • Movement alarm activation • Possibility of flooding in the next 24 hours	• People seriously injured • Personnel are trapped or missing under hazardous conditions • Further threat or danger of escalation • Emergency Response Team activated, put on standby • Damage to mine safety systems • SSE or delegate notified • Emergency Management Team may be activated • May require assistance of external emergency service providers • External support (e.g. WorkSafe, MRS or Police) may be brought into the IMT to assist the MIC. • A vehicle incident with moderate injuries requiring external medical intervention • A fire that can be controlled by an onsite response • An unplanned detonation of explosives with no injuries • A large movement which has blocked egress for personnel • A movement which has the potential to affect the underground operations • A sudden flooding event with potential to trap personnel	• Notify SSE • A major level incident that may result in multiple fatalities and/or trigger significant public interest. • Personnel trapped or seriously injured with high level of risk • Increasing complexity, duration and consequences (out of control) • Of national concern / media interest • Serious damage to safety systems • Emergency Management Plan initiated and may escalate to Corporate Crisis Management Plan. • External emergency service providers assistance required • NZ Mines Rescue mobilized • Need for strategic advice and potential for additional resources beyond the capacity of the mine operator. • Initiate Underground Mines Rescue Protocol for underground level 3 emergencies. • A fire involving explosives • Missing explosives • A large failure with personnel missing/trapped • A large failure that has blocked access/egress from the underground operations • Significant pit flooding that has real potential to affect the underground workings

8 FIRST RESPONSE

First Response is defined as immediately available site assistance and incorporates: Any level 1 and level 2 triggers that can be safely dealt with using immediately available onsite personnel and ER members and requires minimal outside assistance such as ambulance transport.

The Emergency First Response includes:

- BLS (basic life support) CPR and rescue breathing at the layperson level
- AED (automated external defibrillator) use (optional)
- preventing and caring for shock
- spinal injury management
- use of barriers to reduce disease transmission risk
- basic first aid: illness & injury assessment, bandaging, management of fractures & dislocations, and first aid kit considerations
- basic firefighting capabilities
- reconnaissance - information gathering, state of situation, key information to assist decision making.

Underground First Response - MAC-258-PRO-016

8.1 Minestar and Mill Control

Minestar (mill control is set up as a backup call taker) is manned 24 hours 7 days a week, they are set up to first receiver an emergency radio call or a 911 phone call. They are set up with duty cards to prompt the critical first responses to specific incidents. These are designed to be used by the Emergency Call Takers to ensure that vital notifications and actions are not missed during the initial part of an emergency situation. (

Minestar and mill control both have the capability to activate both on site and off site emergency response members. They will get the confirmation from the ER coordinator or the first available manager. The shift supervisor may also initiate the full ER response also if deemed necessary.

This is done through a data base set up on minestar / mill control computers; the pass word to activate the call out is “emergency” (all in lower case). Once emergency responders receive this text they will immediately respond to site and meet at the emergency training room for a brief.

8.2 Back up Response

Back up Response is defined as external emergency service involvement and/or Incident control point activation:

- any level 2 trigger where first response has been ineffective and immediate advice and support is required from OceanaGold personnel who are not on site at the time
- any trigger which requires evacuation of an area, major external emergency service involvement or the forming of the Incident Management Team
- all level 3 response triggers (refer to the MAC-253-FOR-003) TARPs

8.3 Incident Management Team

The Mine Incident Controller (MIC) will assemble the Incident Management Team based on the information they receive from the minestar controller / mill control operator. The MIC will declare the incident a level three if required and follow the appropriate steps.

Guidance on when emergencies escalate from levels 1, 2, or 3 can be referenced in the Trigger Action Response Plans.

8.4 Incident Control Points (On and Off Site)

This refers to several different rooms located around site that will be used as an emergency control room for the duration of an emergency. Which one is used depends on the location and type of emergency.

Macraes Incident Control Points are as follows: (On Site)

- top office – open pit technical services area (also for overall site ICP)
- underground office block – underground technical services area
- processing training room
- Emergency Response trailer is resourced to be set up as a mobile ICP.

(Off Site) Dependent on the emergency it may not be safe to set up the IMT within the three designated areas on site. The following alternatives are available if required.

- Macraes cricket pavilion
- Palmerston event hall
- Dunedin head office

8.5 Mine Security

In an emergency event the IMT may need to secure the mine site. At a site level there are actions in place to ensure no unauthorized persons can enter the mine. If this is to be a longer term action the involvement of the local police will be initiated.

The Mine Incident Controller will organise security points depending on the emergency situation. Upon a level three incidents being declared the Police will assist in securing the Macraes Operations. This will include but is not limited to:

- road blocks on public roads
- block and man security gates to prevent unwanted entry
- close roads public and private if required

9 EMERGENCY COMMUNICATIONS

9.1 Emergency Phone Numbers

• EXT 911 or EXT 666	DDI: 4794 666
• Mill Control Room	EXT 4848
• Macraes Ambulance Mobile #	027 493 3982
• First Aid Room (located at Process Plant)	EXT 4801
• Underground ICP	EXT 4607
• Processing ICP	EXT 4803
• Open pit / alternate ICP	EXT 4802

9.2 Surface Operations

9.2.1 Telephone

The primary mode of communication is by telephone.

• minestar control room	(03) 4794 633
• minestar control room mobile	021 810 793
• process plant control room	(03) 4715 748
• Underground fibre phone (Underground crib room)	4794690

- dialing **911** internally will put you through to minestar or mill control emergency phones.

In the event of a power failure and subsequent PABX failure there are three mains-fail phones on site.

• Process Plant Admin Office (beside Printer)	4718 939
• Process Plant Control Room	4792 735
• Frasers Open Pit Office	479 0683

9.2.2 Mobile Phones

Mobile phone reception is generally reliable on site but can be erratic in certain locations. Mobile phones should not be solely relied upon for emergency contact.

9.2.3 Radio Telephone

- communication with mobile personnel, field workers and operators in the mine, exploration and plant area can be made via the FM radio units.
- personnel either carry hand-held RT's or have access to vehicle installed RT units. All the Macraes Operations vehicles are fitted with RT's.

9.2.4 Radio Channels

Channel	Purpose
Channel 1	Open pit working channel Emergency calls
Channel 2	Open pit working channel Emergency calls
Channel 3	Mill control channel (repeater) Mill/loader operator communications on ROM
Channel 4	Public repeater channel – used by anyone in the area
Channel 5	Job specific communication – longer calls
Channel 6	Mill (Simplex line of site)
Channel 7	Supervisors channel

9.3 Communications Underground Operations

9.3.1 Radio

The main form of communication underground is via radio on the following channels form of communication underground is via radio on the following channels

Channel	Comments	Area Covered
1	Underground/Open Pit link	Open Pit
2	Underground operations	Underground and surface
3	Chat Channel	Underground and surface
4	General	Underground and surface
5	Dedicated emergency channel	Underground and surface. Monitored by minestar
6	Simplex	Line of sight

9.3.2 Telephone

Telephones are located in all refuge chambers. Telephones are generally used during an emergency for phoning in your location during an evacuation to refuge chambers. Phones are located in each refuge chamber as well as the underground crib room and at the portal.

9.3.3 Fibre Optic Cable Telephone

There is a fibre optic cable run throughout the underground mine. This fibre optic line is run down the main escape way as opposed to the fixed party line through the portal.

Fibre optic phone locations are:

- top of escape way (surface)
- underground crib room
- 4M Tele hut (between 4M4 & 4M5)

9.3.4 Stench Gas

The Frasers underground mine has an emergency stench gas system that is utilised to warn personnel of the need to evacuate to refuge chambers. Release of this will be organised by the emergency call taker.

9.4 Radio Silence

All personnel not directly involved should maintain radio silence. After the emergency has ceased, the Incident Controller is to announce over the two-way that the emergency has ended and normal radio traffic may resume

9.5 External Communications & Consultations

The Senior Site Executive will ensure the existence of the Emergency Management Control Plan and an overview of the content of the Plan is communicated to all site personnel, including contractors, who are required to undertake work in operational areas.

The processes shall ensure that operators are provided with an understanding of emergency management control processes, related issues/incidents and any relevant changes in procedures prior to implementation.

This control plan has been developed in conjunction with the following agencies:

- Police
- Fire and rescue
- Civil Defence
- St Johns Ambulance
- New Zealand Mines Rescue
- OGL Crisis Management Team

Macraes Emergency Preparedness Overview

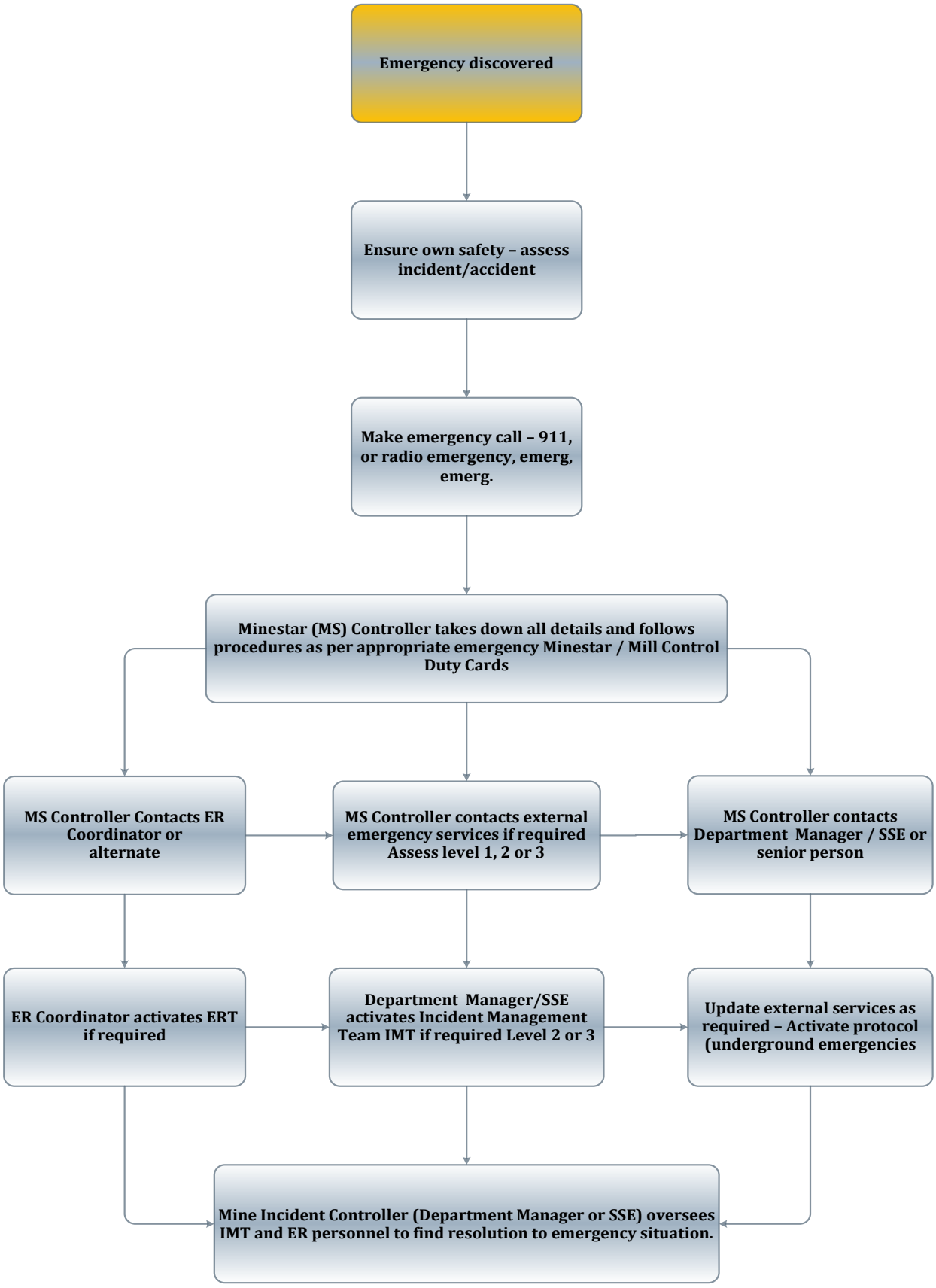


Figure 3: *Emergency preparedness overview*

10 SITE EMERGIENCIES / EVACUATION

10.1 Surface Operations

There are 2 types of evacuation dependent on the emergency:

- local evacuation to a muster point
- mine site evacuation to evacuation point

10.2 Muster Points

There are six main muster points located on the mine site. Radio communication is available between all areas.

- plant site: laydown area adjacent to lone pine dam
- plant alternate site: behind extra fines ROM
- mine office(top Offices): core shed entrance to main office car park
- Fraser's office & underground: FRUG carpark
- open pit workshop: main entrance gate
- coronation open pit: coronation crib hut

When an evacuation of a specific area is signaled all personnel must vacate the defined area and proceed to the relevant Muster Point. The area will be secured in an appropriate manner and sentries placed to prevent access to the area. The supervisor or fire warden of the area must account for all employees, contractors and visitors.

10.3 Mine Site Evacuation

The six mine site/explosives evacuation points are as follows:

- Macraes township church evacuation point "A"
- Golden Point road evacuation point "B"
- Horse Flat road evacuation point "C"
- Macraes/Dunback road evacuation point "D"
- Golden Bar road evacuation point "E"
- Coronation evacuation point "F"

When a mine site evacuation is signalled every person on site who is not required to assist in the emergency must go to one of the six muster points and be accounted for. Rescue workers are exempt from this requirement. The Mine Incident Controller must account for rescue workers.

When moving to an evacuation point, care must be taken to avoid moving into a potentially hazardous situation. Take note of where the emergency is and move away from the area.

If it is likely that the emergency may affect the surrounding Macraes community residents, then the Incident control point will be in the Macraes hall. NZ Police are responsible for any evacuation outside of the mining licence/permit area. However, the Company may become involved in chemical spill clean-up off site, either for advice on how to treat or for requests for neutralising agents such as oxidising agents in the case of a cyanide spill.

Control of external roads and vehicle movement is the responsibility of the NZ Police. Macraes Operations has a responsibility to prevent people entering a hazardous environment hence in an emergency situation it may be necessary to establish road blocks on public roads prior to the NZ Police arriving on the scene. The control of such roadblocks would be handed over to the NZ Police upon their arrival.

An evacuation will be communicated via:

- mine - over the Mine RT system (including U/G RT system)
- plant - plant RT channel or the evacuation siren

Six points have been selected, as they are sufficiently clear of any potential areas where an explosives emergency could occur.

10.4 Explosives Magazine and Manufacturing Plant Emergency Evacuation

Explosives evacuation points are designated areas where personnel should gather in the event of an explosives evacuation. Evacuation points are marked with signs reading “Evacuation Point”. Refer to Macraes Operations Emergency Location Map for locations marked “A - F” and explosives exclusion zones dependent on what type of explosive emergency is initiated.

10.4.1 Explosives Evacuation Procedure

In the event of an emergency situation requiring evacuation of a RedBull Mining Services site or work/transport area, the following procedure applies:

For an evacuation triggered by an incident in the emulsion plant, ANFO storage shed or magazine area:

- the evacuation alarm must be sounded;
- all personnel must evacuate to assembly point 1 at the entrance gate. (note: no one is to enter the risk area; any personnel or vehicles accessing RedBull Mining Services site from the pit access road or magazine area must move to assembly point 2 (extent of Golden Ridge rock stack furthest from magazine area); and
- available personnel are to assume their given roles and undertake the appropriate actions/specified tasks (e.g. minestar/emergency services notification, exclusion zone set up and area control)

For an evacuation triggered by an incident at the ANFO plant

- the evacuation alarm must be sounded;
- all personnel at the ANFO plant must move to assembly point 3 (Macraes township) - assembly point 1 is too close to the ANFO plant (>1000m);
- all other staff must move to assembly point 2 (no one is to enter the risk area);
- available personnel assume their given roles and undertake the appropriate actions/specified tasks (e.g., minestar/emergency services notification, exclusion zone set up and area control);
- Macraes open pit and underground office areas/compounds would need to be evacuated (ANFO plant is within the 1000m minimum exclusion zone in the event of an explosives emergency); and
- RedBull personnel must block the road at Macraes township and liaise with minestar regarding closing the road at the weigh bridge access track intersection.
- a road block will also be required to be established at the intersection of open pit workshop road and Golden Bar road to ensure traffic does not enter the exclusion zone.

10.5 What to Do When You Arrive At an Evacuation Point

The first person to reach each muster/evacuation point will form a roadblock and stop incoming traffic. The most senior representative from Macraes Operations, at each muster/evacuation point will assume the role of ‘muster/evacuation point controller’. It will be the responsibility of each muster/evacuation point controller to take a roll call and communicate via the RT with the other muster/evacuation point controller and the mine incident controller.

On arrival at a muster/evacuation point all personnel are to remain in two-way radio contact and personnel are to remain at the muster/evacuation point until advised otherwise by the mine incident controller.

Note – “all personnel” includes all employees, visitors and contractors that were present on site at the time the evacuation was called.

The muster/evacuation point controllers must be able to account for all visitors and contractors who have signed in at reception offices.

10.6 Open Pit Emergencies / Evacuation

1. Emergency Called
2. Minestar receives call and follows Minestar / Mill Control Emergency Duty Cards MAC-253-PRO-001
3. Once and emergency is called all open pit operators are to stop and park up safety and await further instruction
4. If requested to do so all operators are to assemble to a Muster area or Evacuation Area as determined by Incident Controller/ Supervisor
5. **Incident Controller** (Most Senior Person) takes control and informs personnel:

    - With Communications - Follow instructions
    - Without Communications - Park up in a safe location and stay in machinery until instructed otherwise

10.6.1 Assess situation

- What level is the event
- Who to notify
- What services are required (e.g. ER)

10.6.2 Clear affected area

- Organise specific personnel, areas to clear

10.6.3 Communicate with all muster areas

- Ensure all personnel at muster areas are safe

10.6.4 Account for personnel

- Assign one person to coordinate the accounting of personnel, this person is to:

  – Each muster area to appoint one person to account for personnel
  – Names to be taken of all people who report to a muster area
  – All names to be communicated to incident control point
  – Incident controller to ensure all staff accounted for and develop a list of missing persons

10.6.5 Reassess situation

- Receive update from all relevant personnel
- What level is the event
- Who to notify
- What services are required

If escalated to Level 3, fully implement CIMS process

10.7 Processing Plant Evacuations

1. Emergency Called / Siren raised
2. Mill Control Operator receives call and follows Minestar / Mill Control Emergency Duty Cards MAC-253-PRO-001
3. All personnel to report to a Muster area or Evacuation Area as determined by Incident Controller
4. Incident Controller (Most Senior Person) takes control and informs personnel:

- With Communications — Follow instructions
- Without Communications — evacuate to a safe location and await further instructed otherwise

10.7.1 Assess situation

- What level is the event
- Who to notify
- What services are required (e.g. ER)

10.7.2 Clear affected area

- Organise specific personnel, areas to clear

10.7.3 Communicate with all muster areas

- Ensure all personnel at muster areas are safe

10.7.4 Account for personnel

- Assign one person to coordinate the accounting of personnel, this person is to:

  - Each muster area to appoint one person to account for personnel
  - Names to be taken of all people who report to a muster area
  - All names to be communicated to incident control point
  - Incident controller to ensure all staff accounted for and develop a list of missing persons

10.7.5 Reassess situation

- Receive update from all relevant personnel
- What level is the event
- Who to notify
- What services are required

If escalated to Level 3, fully implement CIMS process

10.8 Underground Evacuations

There are two evacuation scenarios for underground:

- evacuation to refuge chambers
- evacuation to surface

Depending on the reason for the evacuation it may be signaled either by radio, stench gas or anytime an underground mine work smells smoke and is unaware if its source or this could be a combination of all three.

10.8.1 Underground Detection

The best for of detection from a fire emergency is the mine workers smell. If they smell smoke or stench gas they are immediately alerted that there is potential emergency situation and need to act as quickly as possible to get to the closest refuge chamber. They are to remain in that chamber until the emergency is over or released by the emergency response team.

10.9 Underground Main Ladderway 3EW1

The 3EW1 Main Ladderway is not to be evacuated too in the event of a fire or any irrespirable atmosphere emergency. The ladderway is in fresh air but this cannot be guaranteed during an irrespirable atmosphere emergency. Refer to MAC-257-RSK-008 UG Fire and Explosion

The ladderway can be used by emergency responders in the event of a search and rescue operation, upon approval by the Underground Mine Manager, Site Senior Executive or Mine Incident Controller.

The ladderway is designed as a second means of egress in the event of a major rock fall or collapse and in association with other ladderways throughout the mine. In the event that the ladderway is to be used it will be set up and controlled by the emergency response team and conducted in a controlled manor.

10.9.1 Refuge Chamber Evacuation

Upon hearing an emergency radio call or smelling the stench gas / or smoke, all personnel will make their way immediately to the nearest refuge chamber. They should warn others in their general area as they go.

Once at the refuge chamber, the most senior person should write down the names of all persons present and phone them through to the tag board controller or MineStar controller. Operational directions for the chamber, mine maps and adequate water are located inside the chambers.

Note: Under no circumstances is the ladderway to be used in the event of a fire or irrespirable atmosphere emergency to exit the mine.

10.9.2 Evacuation to Surface

Upon hearing an evacuation to surface radio call, all personnel under the direction of the Shift Supervisor should make their way to the surface (this may require assembling at the U/G crib room before making a strategic plan to evacuate to the surface). Those personnel with vehicles should contact the shift boss for directions on who to pick up. Once arriving at the surface all personnel should immediately remove their tag from the tag board.

MAC-257-RSK-000 UG Ground Control

MAC-257-PRO-002 Inundation and Inrush Management Plan

10.9.3 Accounting for Personnel

Every person on site must be accounted for in the event of evacuation including employees, contractors and visitors.

It is important that all visitors and contractors sign in and out at reception each time they are on site. Failure to do this could endanger the lives of rescuers. Visitor and contractor sign in books are located at all Administration Office reception areas, Management Office receptions, Mining and Process reception and Red Bull's reception. These books must be taken to the Muster/Evacuation points in an emergency.

Underground visitors will be logged in the visitor's book located in the Technical Services office and will be tagged on with their guide and also documented on the itinerant board.

10.9.4 Methods of Accounting for Personnel

Macraes mine operation is spread out over a large area to ensure all personnel on site can be accounted for the following personnel accounting methods are used at Macraes:

- Cardex – an electronic card system used to enter most active mining areas. This requires an authorised access card to enter these locations. A report can be run from various locations which will identify where and when personnel have entered the mining areas. (due to the layout of the Macraes site Cardex does not cover the whole mine)
- all mining areas have a sign in and sign out book located at the entrance to the area. This is to capture any personnel who may be visiting or authorised for short term visit to site.
- shift attendance sheets – all crews are required to sign in as present on arrival to their mining area.
- underground tag board (located at portal)
- deployment sheets with locations and activities for the current shift

Dependent on the situation a combination of the above accounting methods may need to be implemented.

10.9.5 Employee Emergency Contact Records

All employment records are kept in the HR management data base employee connect with details of emergency contacts of all employees working at Macraes mine site.

Contractors are required to have a contactable representative that will advise Macraes personnel of emergency details of their workers.

Contractor emergency details are also stored in the HSE drive with their induction records.

10.10 Family Liaison

The Macraes Coronation Hall, situated on the road through the township is suitable for family liaison, welfare, psychosocial support etc. It can hold up to 200 people, has toilets and kitchen facilities, and a stage. There are several power points and a telephone socket. Keys to the Coronation Hall can be obtained from the Stanley's Hotel publican, 03 465 2400, or Rebecca Tisdall - 03 465 2493 / 027 311 6221.

10.11 Post Emergency Start Up

Once an incident has escalated to a level two or three emergency, then a formal process is required to down grade the emergency. This process simply comes from the Mine Incident Controller after consultation with the IMT. Certain considerations to be taken into account are:

- What resources are still required to deal with the situation
- What personnel are required
- Timeframes/ timelines
- Clear responsibilities to be put in place
- IAP may be required to finalise the down grade and restore operations back to normal working order – this needs to be authorised by the MIC
- Is regulator permission required to restore operations
- Ongoing or after the event issues e.g. are staff going to need on going counselling or assistance
- Full debrief needs to be scheduled as soon as possible with relative and key personnel
- An action plan may be required to ensure improvements and learnings are followed through
- Business continuity plan will come into effect (How/who/where)

This list is a guide only the IMT needs to thoroughly assess what other factors dependent on the incident.

11 EMERGENCY RESPONSE CAPABILITIES

Macraes Operation has set up its own emergency response capabilities to respond in an emergency situation.

Capabilities and competencies covered in the emergency response training are as follows:

- full medical upon joining, and annual 12 month health assessment
- fitness test – minimum requirement for full operation ER members
- BG4 and CABA breathing apparatus training in irrespirable atmospheres
- gas and confined space training
- rope rescue
- advanced medical training
- vetter bag lifting operations
- vehicle extraction
- underground search and rescue
- underground fire
- surface fire HAZMAT response

Competency levels are put in place to ensure emergency response personnel have the correct level of capabilities:

Intermediate Advanced	Competent at this level but **no longer current** as has not trained in discipline for over 12 months	**Basic**	New starter to this discipline. Attended one training and has an understanding of the basics.	**Intermediate**	Has attended at least two training sessions and is competent in all aspects of the discipline.	**Advanced**	Has attended at least 3 training sessions and is competent in all aspects of this discipline. ***Indicates capability to run training in this discipline.**

11.1 First Aid Arrangements

Macraes operations will ensure that training is providing to ensure that someone is on site at all times with senior first aid capabilities.

The mine is equipped with fully equipped first aid rooms and a road worthy ambulance to transport patients if required.

Certain incidents or accidents may require employees to be transported to hospital or medical treatment facilities. In these cases a full assessment by the following people is required.

- Site Health Nurse
- ER Coordinator or delegate
- ER members with PHEC first aid training
- Site personnel in conjunction with medical services via phone link

If the assessment warrants the transport of the personnel it may require additional personnel to travel in assistance with the patient. Cases that a second person is required are

- Heart conditions
- Electric shocks
- Potential stroke

In these cases it is preferd that medical services are on route to site to pick up patient. The may be time this is not available in severe weather events etc. In this case a second person is required to travel and extra medical resourcing may be required. The site ambulance is to be utilized in these circumstances.

In all serious medical cases external agencies are to be contacted ASAP to ensure professional help is on route as quickly and effectively as possible.

11.2 Inspections on Emergency Response Capabilities

Area inspections are required to be carried out across the site ensuring that all emergency equipment is in place, up to date and in working order.

The following areas are required to be inspected on a monthly basis:

- underground refuge chambers (includes underground trauma packs)
- underground first response capabilities BG4 and CABA units
- first aid rooms
- processing CABA & firefighting gear storage area (Plant and UG fire shed)
- rescue rope and set up at top of underground escape way
- coronation trauma pack
- emergency response training room
- emergency response container
- emergency response trailers

11.3 Entrapment

Selected ERT members who are physically capable of rescue operations at the underground operations are trained in the above skills but also receive the following additional training:

- Self-contained breathing apparatus such as open circuit sets for short-term rescues/emergency operations, and closed circuit sets for long-term rescue/emergency operations
- Underground and confined space rescue techniques
- Specialist underground instruments for monitoring atmospheric conditions
- Underground communication systems
- Fighting and controlling underground or confined space fires

12 ROLES AND RESPONSIBILITIES

12.1 The CIMS Functions

Incident responses require a wide range of information to be analysed and activities to be carried out. Macraes Operations IMT structure is based on the CIMS emergency management model. The resulting tasks and responsibilities are spilt up into seven main functions to enable multiple departments with assistance from external agencies to coordinate resources effectively, and make it easier for their personnel to work alongside each other. Figure 4 shows the main functions of the IMT.

All the CIMS functions need to be considered at an incident, whether they are carried out by a single person in charge of a small response, or by teams of personnel in a major response. Departments may condense or amend the functions to suit their requirements and the specific objectives for a particular incident.

The responsibilities for each of the functions are summarised in Table below:

12.2 Incident Management team

Role	Accountability
SSE	– SSE may also be the Mine Incident Controller as per role and accountability below. – If the incident/emergency has an approved mine incident controller in place the SSE role becomes a main support role – Liaise with OGL corporate personnel – Potentially be a backup MIC – Activate OGL delegate to be represented in the ECC – Delegate resources as required
Mine Incident Controller (MIC)	– Delegates tasking (Managers) in IMT utilising ideal span of control for team members. – Leads initial briefing of type, time, and magnitude of event as a general summary. – Outline the consequences of that event to date and any actions thus far. – Allocates any site specific Duty Cards according to EMCP if not done – Ensures emergency services and agencies are pre-allocated areas according to EMCP and that they are briefed on arrival. (delegated tasking) – Responsible for setting objectives (rescue / recovery) – Leads IMT in decision making ensuring all decisions are consultative and collaborative – Calls SitReps as required to maintain situational awareness. (managers and specialist advisors only attend as required or requested) – Signs off IAP and RA (only authority to do this under legislation) – Communicates officially with LC – Sitreps (regular scheduled or called for by emergency dynamic to ensure IMT situational awareness at all times. May influence objective, strategy, tactics therefore intel/ planning, logistics and operations) – Higher level resourcing requests to support IAP and / or IMT function – IAP and RA – Anticipates relief manning and staggered change over with appropriate briefings – Ensure consultative process in IAP build – Downgrades to level 2 when appropriate
Planning Coordinator	– Appoint, brief and task planning team. – Prepare Incident Action Plan. – Maintain maps and display boards. – Track incident and resources status. – Liaise with technical experts. – Conduct planning meetings. – Record decisions, actions, and other activities. – developing long-term plans and contingency plans,

Role	Accountability
	– Assisting with planning the transition to recovery, – Convening and conducting planning meetings, and – Forecasting medium-to-long term resourcing requirements that will need to be provided by logistics and supporting agencies.
Operations Coordinator	– Appoint brief and task Operations team. – Implement tactics for the Incident Action Plan. – Manage and supervise operations at the incident. – Establish staging areas. – Assemble and deploy resources. – Provide regular situation status reports. – Review resource needs. – Record decisions, actions, and other activities. – Coordinating day-to-day response activities on behalf of the Controller, – Contributing to the development of the Action Plan, – Implementing the Action Plan, making minor amendments required – Planning response tasks in detail, – Forecasting resource use or needs to Logistics, – Recommending to the Mine Incident Controller which resources are critical, – Keeping the Controller and IMT informed about the response, – Resolving minor conflicts between response agencies.
Logistics Coordinator	– Appoint brief and task Logistics team. – Help prepare the Incident Action Plan. – Prepare the communications plan. – Ensure incident control room is sufficiently stocked. – Organise resources – RT's, telephones, binoculars, first aid equipment, vehicles, and catering needs. – Process requests for additional resources. – Advise Operations of resource availability. – Record decisions, actions, and other activities.
Intelligence Coordinator	– Receiving authorised resource requests, and procuring the resources, – Requesting, receiving, storing, maintaining, and issuing procured resources, – Participating in the development of the action plan, – Tracking resource use and financial expenditure, – Activating and operating any required assembly areas, – Providing transport, – Establishing and maintaining information technology networks, – Providing record-keeping and administration support, – Collating and matching offers of assistance, and – Advising the controller and the IMT of logistics issues and resource levels.
Emergency Response Coordinator	– Confirm requirement (or not) for external emergency services. – Confirm requirement (or not) for full ERT activation. – Coordinate with Mine Incident Controller and organise an ERT response to the situation. – Assess further requirements as more information is received. – Liaise with Supervisor and formulate response plans to the emergency. – Communicate these plans to the ERT Captain.
Public Information Management P-I-M	– Preparing and sharing information directly to the public (via social media, public meetings, pamphlets etc.), or via the media. Note that the content of official information such as warnings is generated by official processes, and approved by the Controller, – Monitoring the public and media reactions and passing information to the relevant CIMS functions,

Role	Accountability
	– Coordinating with other response agencies' PIM activities, – Public Preparing spokespeople for interviews and media conferences (see below) – Liaising with the community, – Working with the media, including arrangements for media visits and media conferences, – Liaising with VIPs and their personnel about site visits, – Ensuring call centres, helplines and reception personnel have current public information and key messages, – Participating in the development of the action plan, and – Advising the Controller on PIM issues.
Welfare	– Welfare is responsible for managing the consequences of an incident on individuals, families/whanau, and communities. The Welfare Manager also advises on the Welfare resources, organisational structure, and facilities.

12.2.1 IMT Support Roles

Roles	Accountability
Safety Manager	– Monitor safety conditions and hazards. – Report directly to Mine Incident Controller. – Establish communications with required personnel. – Notify Mine Incident Controller of potential issues. – Record decisions, actions, and other activities.
HR Manager	– Liaise with incident controller on employee and family updates – Liaise with contact within the Local Controller (LC) and pass information as required – Ensure all employee records and details are available
Environmental Officer	– Monitor environmental conditions and hazards. – Report directly to Mine Incident Controller. – Establish communications with required personnel. – Notify Mine Incident Controller of potential issues. – Record decisions, actions, and other activities.
Recorder	– Person designated to keep situation boards and time times up to date
Person Discovering Emergency Situation (Incident controller – Initial most senior person on the scene of the incident)	– Ensure scene safety and assist if able. – Make a quick assessment of emergency. – Phone or RT call to Minestar/Mill Control or directly to Emergency Services.
Emergency Call Taker - Minestar controller or Mill Control Operator	– Select the appropriate Emergency Procedure Duty Card guide and follow the prompts.
Supervisor (Incident controller – Initial most	– Evaluate available information and organise a response protecting Life, Environment, Property and Production, in that order. – Liaise with the Emergency Response Coordinator regarding response. – Site/scene security.

senior person on the scene of the incident)	– Notification to senior management.
Emergency Response Team Captain	– Follow directions given by the Emergency Response Coordinator. – Direct the Emergency Response Team – Pass relevant information back to the Emergency Response Coordinator – Emergency Response Structure
All Mine Workers Including Contractors	– Ensure their own safety and other in immediate area – Assist if safe to do so – Maintain radio silence

12.3 Incident Management Team Structure (IMT)

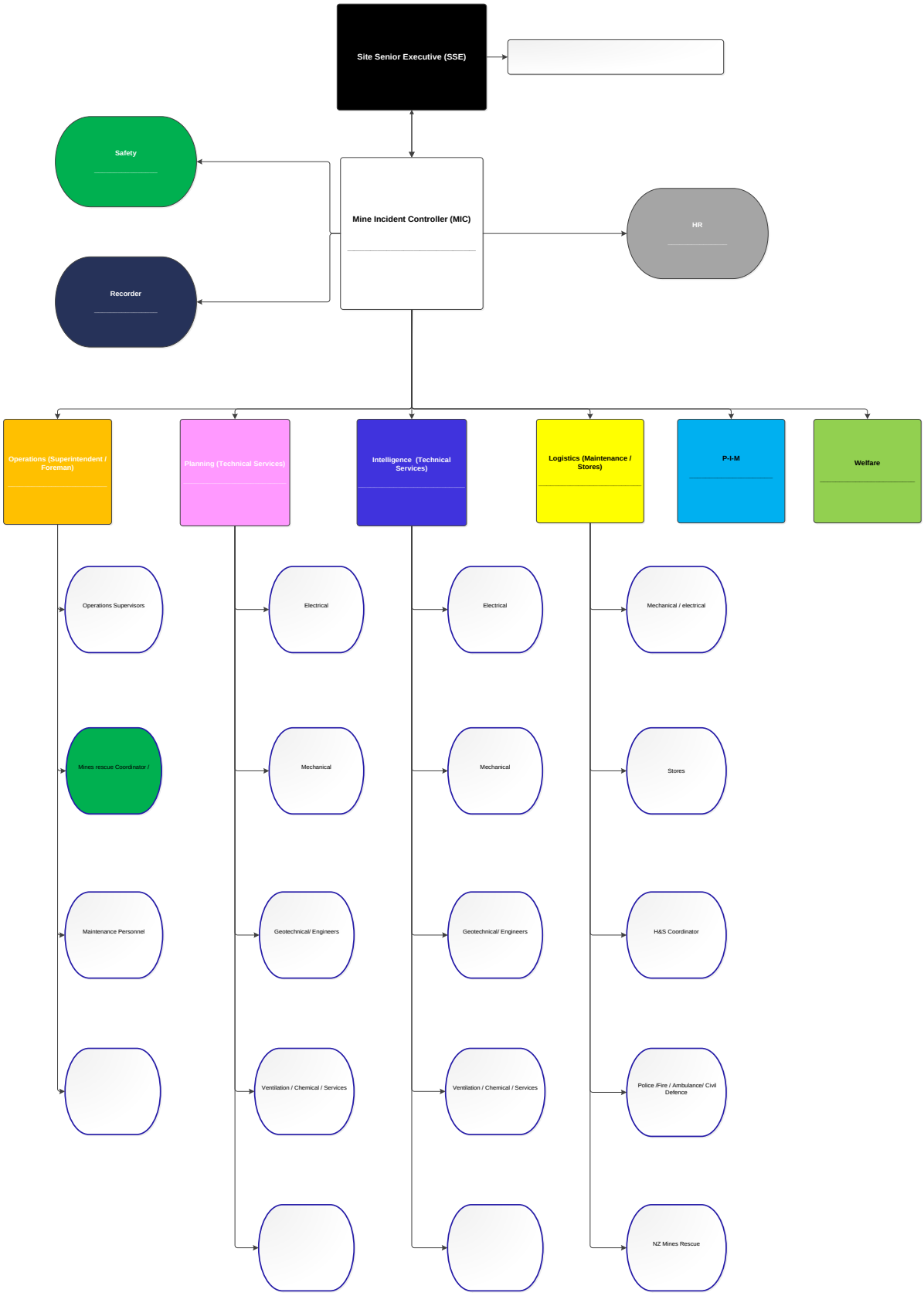


Figure 4: IMT Emergency Management Structure

12.4 Emergency Response Teams

Figure 5: Emergency Response Team Record Sheet

12.5 Incident Management Team Resourcing

Resourcing of emergency management capabilities is to be reviewed every year during the budget planning by each department and overall by the Health, Safety and Training Manager. This will include any major capital works or equipment that needs to be purchase or update and also include what training will be required both internally and externally.

Other resources required are:

- pre-determined location for ICP
- backup power supply
- secured access
- communications
- landline (multiple)
- VHF (where applies)
- IT ports (multiple)
- copy of all emergency numbers
- hard copy of EMCP (Inclusive site TARPS), UG Mines Emergency Protocol,
- computers / copiers / printers/ faxes
- whiteboards
- meeting room suitable for IMT briefings
- multiple rooms for IMT teams
- allocated emergency services and agency area
- site plans (current hard copy)
- incident boards
- vests
- food and drinks
- amenities

13 TRIGER ACTION RESPONSE PLANS

13.1 TARPS

Trigger Action Response Plans (TARPs) and Emergency Action Plans (EAPs) define trigger points that necessitate specific actions to be taken in an emergency event. The aforementioned plans shall be authorised by the HS&T Manager and are subject to approval by the SSE.

Trigger Action Response Plans - T.A.R.Ps
1. Serious Injury/Multi Casualty (Including Fatality)
2. Multi Casualty Incident
3. General – Illness
4. Fire - surface
5. Machinery/Tyre Fire
6. Frasers Underground - Fire
7. Weather Event
8. Tailings Impoundment Failure (Emergency Action Plan – Tailings Storage Facilities)
9. Mining - Vehicle Accident
10. Explosives Emergency (Emergency Response Action Plan – Frasers West Explosives Reserve)
11. Pit Wall Failure
12. Major Strata Failure - Earthquake
13. Entrapment
14. Flooding
15. Process Plant - Chemical Spill and/or Gas Leak
16. Confined Space Incident
17. Explosion
18. Missing Persons
19. Inrush
20. Vehicle Collision (Persons trapped)
21. Violence/Bomb Threat
22. Working at Height – suspension / fall from height

13.2 Incident Action Plan (IAP) Process

At each stage of the planning process, functions need to ensure that the latest information on hazard impacts and available resources is used.

13.2.1 Objectives Analysis

This is the most important step in the planning process; it is when the Mine Incident Controller (MIC) and planning team determine what the action plan is meant to achieve. It consists of the following steps:

Reviewing the situation, confirming:

- the goal and objectives of the plan
- the resources available, including any resources still to arrive
- response actions to date
- initial hazard impacts
- area of operations for the response, including outside the affected area, and
- timeline for the response (in terms of the overall operation and the time available for planning), and the time the Action Plan will be completed.

13.2.2 Options Development / Strategies

During this step, the planning team develops options that will achieve the objectives. The number of options and detail that is developed depends on the time and personnel available. Ideally, planners consider two or three options, to avoid jumping to a conclusion without having considered alternatives.

The options need to be different from each other, must achieve the response objectives, have acceptable levels of risk, and be feasible with the available resources. Experienced MIC and planners may be able to develop a single option, using their judgement to save time. The MIC or response manager may give guidance on what options are to be developed in this step of the process.

All options must be evaluated against the following:

- impact analysis, in particular the most likely, and the most dangerous/worst case scenarios for hazards to develop
- local environment, and how this will affect the response
- available resources, their numbers, location, capabilities, and requirements, and
- available time.

13.2.3 Action Plan Development / Assignments

During this step, the Action Plan is written. If time is short, it may be written as a brief, to be delivered verbally. It must be documented for future reference. Maps and tables may be included to aid understanding. Specialist sections and appendices need to be written by those functions. These allow important specialist information and instructions to be included, without cluttering the main body of the Action Plan.

To aid the reader, who may have limited time and be working in adverse conditions, plans need to be clear, brief, and avoid jargon. Ideally, formatting, grammar, and spelling are checked. The MIC approves the final version, and this becomes the official action plan.

In underground level three emergencies this IAP will be sent through to the local controller (police) for review and to keep the local controller up-to-date with what action is being proposed.

IAP areas to consider:

- according to objective set by MIC
- approved only by MIC
- primary task of Intel / Planning
- consideration of parallel planning (may require sub groups within Intel/planning)
- states strategies
- operational period of the IAP
- assignments and accountabilities

- communication plan
- utilise common IAP templates (CIMS)
- risk assessments attached to all IAPs
- utilise common RA templates (Agreed as industry best practice. Suggested JHA type task orientated and commonality of design)
- any approved IAP's can only implemented by operations according to that IAP.
- operations must abide by risk assessment conditions according to approved IAP

13.3 Response Documents

CIMS relies on the use of standardised templates to aid information management, information collation and analysis, planning and decision-making. Appendix H includes the recommended content for situation reports (SitReps) / Action Plans.

ICP areas and boards have been based on the CIMs model to assist when external agencies are involved all parties are using a similar system.

14 MONITOR & REVIEW

To make sure that the mine and its workers are ready in the event of an emergency mine operators should:

- test the plan at least twice each year using mock emergencies
- conduct investigations after any emergency events.
- regularly inspect, check and ensure that all emergency equipment is working including:
  - breathing equipment
  - refuge stations and other places of safety
  - firefighting equipment
  - first aid equipment
  - any other critical equipment contained in the plan
- provide regular mine rescue training for emergency response workers at the mine, and
- recruit, train and retain sufficient emergency response workers to implement the plan.

The adequacy of the maintenance and inspection programmes identified in the CCCS is ensured by the Document Owner and the SSE conjointly reviewing the CCCS on completion.

15 EMERGENCY RESOURCES

15.1 Incident Control Points

This title refers to several different rooms located around site that will be used as a control room for the duration of an emergency.

Three main ICPs are set up at Macraes:

Underground ICP

- Processing ICP
- Open pit / alternate ICP

Each ICP is set up the same so each serves as a backup if for some reason one needs to be evacuated. If all ICPs are evacuated working with civil defence and the police a secondary location will be set up to manage the situation.

These locations must be equipped with the following resources:

- duty cards (including vests and prompt cards)
- incident action plan boards / situation boards
- current maps
- JHA forms
- incident action plans (electronic version when possible)
- internet access / computers
- phones (including mobile coverage and phone lists)
- access to extra office facilities

15.2 Emergency Response Training Room

Equipped training room with BG4's, CABA units stored in cool dry area, cap lamps, self-rescuers, captain's bags, gas monitors and radios.

Back up oxygen cylinders, ice and soda lime for BG4 refills, oxygen refill equipment.

15.3 Ambulance

The mine site is equipped with a 4WD ambulance which is located beside the plant first aid room. This vehicle is fitted out with all basic ambulance equipment and has been suitably modified for underground use.

The ambulance is too be used under the guidance of emergency response personnel and for patients in serious conditions refer to site nurse or emergency services.

15.4 Rescue Trailers

There are 2 main ER trailers set up for emergencies situations. The trailers are strategically located across site. These trailers contain enough rescue equipment for the initial response to most emergencies.

15.5 ER Storage Container

The ER storage container is located at the administration muster area beside the exploration core shed. This contains all the additional emergency response equipment required for site. It also has back up food supplies, sleeping bags, mattresses and other back up gear that may be required.

15.6 Emergency Response Personnel

The Emergency Response team comprises between up to 50 and 55 personnel at different skill levels. Emergency Response team members are selected to ensure all shifts have adequate emergency response coverage.

15.7 Fire Trucks

There are two dedicated fire trucks located at Macraes Operations. One is stationed at the Processing Plant and the other is stationed at the underground. Both trucks are equipped with firefighting gear for first response to fire situations.

Additional fire clothing is also located at processing and at the training room for larger scale fire events.

15.8 First aid Rooms

First aid rooms are set up at three locations across the Macraes site:

- Underground office block on surface,
- Open pit office block – top offices
- Processing office block

All first aid rooms are set up with trauma packs, medical oxygen and basic first aid supplies.

15.9 Trauma Packs

Trauma packs have been set up across the Macraes site so that in the event of a serious medical emergency trained first aid and PHEC trained personnel have quick access to medical supplies

.Trauma Packs are located:-

- Ambulance;
- First Aid Room at Plant;
- Coronation in the Supervisor's Office;
- FRUG Muster Room;
- Trauma Packs underground are located in refuge chambers –
    - 1B9,
    - SP15,
    - 2NCU1,
    - RAR,
    - 2K6

15.9.1 Defibrillation devices

Below is a list of where all the defibrillators are located:-

- Foyer at Top Office;
- Ambulance;
- First Aid Room at Plant;
- Coronation in the Supervisor's Office;
- Heavy Vehicle Workshop;
- FRUG Muster Room;
- FRUG Underground Crib;

15.10 Family Liaison Facilities

The Macraes Coronation Hall, situated on the road through the township is suitable for family liaison, welfare, psychosocial support etc. It can hold up to 200 people, has toilets and kitchen facilities, and a stage. There are several power points and a telephone socket. Keys to the Coronation Hall can be obtained from the Stanley's Hotel publican, 03 465 2400, or 03 465 2493 / 027 311 6221.

Extra resources can be used from Palmerston, Oamaru, Dunedin and Waikouaiti through police liaison officer.

Macraes Operation also has a good relationship with the local civil defence that can provide support in manning these facilities.

15.11 Food and Back up Supplies

Emergency food supplies are kept on site in the event that the operation is cut off from nearing towns. There are also sleeping bags and mattresses also in case personnel are unable to get off site safely.

The Stanley's Hotel also has food supplies, cooking facilities and accommodation that can be utilised if required.

16 EXTERNAL RESOURCES

16.1 New Zealand Mine Rescue Service

NZMRS are available to provide assistance for long duration underground rescue operations. The closest station is on the west coast at Rapahoe.

16.1.1 Mobilisation Procedure for Mines Rescue NZ

In the event that Emergency response is required at an event at Macraes Operation, the following number is to be called:

- Rapahoe Station 03 762 7828 (24hr emergency contact)

In the unlikely event that contact cannot be made via this number, the alternative contact details are:

- General Manager Mobile 021 366 500
- Training/Safety Officer Mobile 021 222 2092
- Training/Safety Officer Mobile 021 336 500

16.1.2 Initial call to Mines Rescue NZ

- emergency response personnel will report to the emergency response station to ready for deployment.
- the necessary number of teams will be deployed to the mine site and additional teams will remain at the Rapahoe Station for forward deployment if required.
- in the event of a major incident the Rapahoe Station will be manned at all times.
- if an incident warrants it, backup teams/resources are available from Reefton and Huntly. Mines Rescue has a procedure in place for the deployment of personnel between Rapahoe and Huntly via helicopter and fixed wing aircraft.
- if BG4 breathing apparatus is being used, Emergency response personnel will be based at the Rescue Station to clean and re-commission sets. Sufficient stores are maintained to replenish operational supplies as required. BG4 sets could be cleaned and re-commissioned within 2 hours.
- a senior emergency response member will be part of the incident management team.
- if gas analysis is required, a person trained in the use of the gas chromatograph will be based at the Rescue Station with 24hr expert support available from CMT in Australia.

16.2 Martha Mine Rescue (Waihi Operations)

Located near Tauranga in the North Island Martha mine has approximately 30 fully trained emergency response members and could provide assistance for long duration underground rescue operations.

16.3 St John Ambulance

St John Ambulance provides emergency medical aid and transport for accident/illness casualties. Initial response usually comes from Dunedin located 95 kilometres away and backup response coming from Palmerston (35km), Ranfurly (60klm) or Oamaru (92klm). Response from all stations is generally about 50 minutes for urgent calls.

- Contact by phoning 111.

St John Ambulance also operates the rescue helicopter located at Taieri airfield in Mosgiel. The helicopter takes 25 minutes to reach site and will be dispatched if the incident/illness justifies its use.

Should the helicopter be required; a manual for helicopter operations is located in the site ambulance. (Grey box)

16.4 New Zealand Fire Service

The closest fire station is located in Palmerston which is 35 kilometres from the mine. Response time is approximately 30 minutes. Fire service response for chemical incidents will come from Dunedin and will take approximately 1 hour 15 minutes

16.5 Available Air Support

- Central South Island Helicopters (03) 439 5656 or 027 457 0758
- Helicopters Otago (03) 489 7322

16.6 Local Controller (LC)

The LC will be set up once the Mine Incident Controller has declared a level three incident. Its main purpose is to assist the communication process between the mine and external agencies.

The following is how the LC is determined and set up.

- determined by local police (probable local station)
- above includes consultation process between mine site and police
- pre-determined location recorded in EMCP
- copy of current site plans and EMCP
- communication between LC and ICP assured
- activation process is agreed and recorded in EMCP
- ensure critical activation and implementation advice is logged into Police call centre database. (site access point, site security, reporting areas on site, LC location and resourcing)
- lead by Emergency Coordinator EC (senior Police Officer)
- underground protocol comes into effect when
  - any stakeholder declares a level 3 event
  - MIC, CIE and police are notified
  - CIE appoints MIC
  - LC is established

EC contacts MIC informing that LC is operational.

16.7 Underground Mines Emergency Protocol – Police Actions

This action plan has been developed from the Dunedin police and what they do once a level three incident has been declared. The following action points must be taken (these are not necessarily in a priority order);

Step	Action
1	Dispatch a Police Liaison Officer and at least one other Police staff member with their mobility devices to the mine. The Police Liaison Officer will be a person trained in CIMS (minimum) and will have completed the SAR Managers' (advanced Incident Controllers) course. Task the Police Liaison Officer and other staff member to communicate the initial response Incident Action Plan (IAP) and any subsequent IAP to Dunedin Police via e-mail **dcc.southern@police.govt.nz** as soon as possible (this may include photographing the IAP and driving to cell coverage, e-mail the photo).
2	Establish perimeter control at the gate. The mine company indicates it will allocate staff to gate security, however a police presence may be required, even if only initially.
3	Establish communication with the mine and the Mines Incident Controller. If the operation is to be an extended one consider obtaining Vodafone enhancement of the cell net if necessary.
4	Appoint a Police Forward Controller to manage all Police functions (including support and staff to the perimeter control and mine). The Police Incident Controller will be based at Macraes Mine. As a priority, the Police Incident Controller will dispatch staff to open the Macraes Flat Coronation Hall - establish family liaison, including communicating with families that this is the meeting point, and arranging welfare and psychosocial support for families. This will include activating the local CD Welfare Plan.
5	Advise the District Commander via the District Command Centre and provide SitReps. The District Commander will assume the role of Emergency Coordinator.
6	Establish Emergency Coordination Centre/Local Controller (LC) at the Dunedin Central Police, 3rd floor District Commend Centre Room (DCC). This will require a 2IC, Planning/Intel and Logistics Officers. They will receive the initial response IAP, arrange any support required by the Mines Incident Controller and (prepare to) brief the Emergency Coordinator. Keep the District Commander briefed.
7	Confirm activation of Ambulance and advise DHB of likely incoming injured. Dispatch liaison and security to the hospital as required.
8	Advise PNHQ (NCCC); request the National DVI plan to be activated.

16.8 Urban Search and Rescue (USAR)

Urban Search and Rescue involves finding and rescuing people trapped when a structure collapses, for example if a single building collapses or as a result of a major landslide or earthquake.

In New Zealand USAR comes under the umbrella of the New Zealand Fire Service.

New Zealand has USAR taskforces based in Auckland, Palmerston North, and Christchurch. Taskforces include firefighters, search and rescue **dog handlers** , communications experts, engineers, other technical experts, and doctors and paramedics. The taskforces also call on external support and expertise as required, in areas such as construction, heavy machinery operation and specialist equipment.

16.9 Additional Resources

Include but are not limited to:

- software for geotechnical analysis, design and planning
- specialist contractors and service providers
- equipment – from overseas
- associated controlled documents

17 TRAINING

17.1 Emergency Personnel Training

Training for first response personnel (ER Members) will be conducted in accordance with the annual ER training plan which will be approved by the Safety Manager.

Training for Emergency Management Team members shall be on an annual basis and include a full desktop scenario.

Training for Crisis Management Team members will be as per OceanaGold corporate requirements.

Trainee	Training Requirement
All Staff & Contractors	• All OGL Macraes Gold Mine personnel shall receive required site-specific skill and knowledge during mandatory induction training, refresher training, and ongoing job safety training as per the Macraes site training plan • Familiarised with our sites Emergency Management process • Trained on the principles and processes in this procedure with a theory assessment • Additional training will be conducted whenever significant changes are made to the Management Plan • All persons affected by the requirements of this plan shall have an understanding of the plan and their roles and responsibilities
Supervisors	• All of the above • All production supervisor will be required to be full training and obtain a B Grade quarry / tunnel managers certificate of competence • Level 4 CIMS
Incident Management Team (IMT) members – consist of foreman, superintendents and technical service personnel	• Emergency management training • IAP development training • CIMS level 2 minimum • Desk top emergency scenario training
Mine Incident Controllers (MIC)	• Level 4 CIMS
Emergency Response	• Full medical upon joining, and annual 12 month health assessment • Fitness test – minimum requirement for full operation ER members • BG4 and CABA breathing apparatus training in irrespirable atmospheres • Rope rescue • Advanced medical training • Vetter bag lifting operations • Vehicle extraction • Underground search and rescue • Underground fire • Surface fire HAZMAT response

18 DEALING WITH THE MEDIA

The only personnel authorised to talk to the media on any issue are:

- corporate Investor relations department or CEO
- any media contact or request on any issue should be answered as follows: “I am not authorised to comment”.

18.1 Police Media Relations

Any requests from the media for information regarding a mines emergency are to be directed to the Local Controller at the Dunedin Central Police Station, or the Southern District Media Liaison Officer.

- Dunedin Central (03) 471 4800

18.1.1 Public Information Management (PIM)

Public Information Management (PIM) is responsible for informing the public about the incident and the response (including actions they need to take), media liaison and monitoring, and community liaison. On the Mine Incident Controller’s direction PIM also issue warnings and advisories. (Usually NZ police will fill this role)

The lead agency has responsibility for developing key messages and coordinating with other agencies’ PIM personnel to ensure consistency. A multi-agency PIM group may be required to manage PIM during a response.

19 INCIDENT TEAM CONTACTS

19.1.1 Management Team

Title	Work Ext	Mobile
Site Senior Executive	4629	021 413 752
Mining Superintendent	4844	021 723 592
Process Plant Manager	4885	021 248 8195
Fraser Underground Manager	4647	021 248 4288
Environmental Supervisor	4618	021 289 9001
Health, Safety & Training Manager	4613	021 248 0714
Emergency Response Coordinator	4631	021 396 191
Top Office Incident Control Room (ICP)	4802	

19.1.2 Process Plant Emergency

Position	Who	Work Ext	Mobile
Mine Incident Controller	Process Manager	4868	027 523 5495
Alternate Mine Incident Controller	Process Foreman	4842	021 927 178
Alternate Mine Incident Controller	Process Foreman	4825	027 380 4988
Alternate Mine Incident Controller	Maintenance Superintendent	4850	027 435 0398
Alternate Mine Incident Controller	Electrical Supervisor	4828	021 924 817
Alternate Mine Incident Controller	Metallurgical Superintendent	4883	021 846 242
Safety officer	Projects Supervisor	4849	021 923 462
Incident Control Room (ICP)	Training Room	4803	

19.1.3 Mining Emergency

Position	Who	Work Ext	Mobile
Mine Incident Controller	Open Pit Mine Superintendent	4844	021 723 592
Alternate Mine Incident Controller	Training Coordinator	4653	021 226 3416
Alternate Mine Incident Controller	Open Pit Foreman	4603	027 243 2746

19.1.4 Underground Emergency

Position	Who	Work Ext	Mobile
Mine Incident Controller	UG Mine Manager	4647	021 248 4288
Alternate Mine Incident Controller	UG Production Superintendent	4628	027 247 9019
Alternate Mine Incident Controller	UG Foreman	4675	021 248 4288
Alternate Mine Incident Controller	UG Foreman	4675	021 222 1414
Alternate Mine Incident Controller	Senior UG Geologist	4679	021 933 869
Alternate Mine Incident Controller	UG Geotechnical Engineer	4641	021 027 46267
Alternate Mine Incident Controller	UG Project Engineer	4640	021 142 8478
Alternate Mine Incident Controller	UG Electrical Superintendent	4660	021 222 0415
Alternate Mine Incident Controller	UG Mechanical Superintendent	4661	021 222 0413

Position	Who	Work Ext	Mobile
Incident Control Room (ICP)	UG Admin Office	4607	
Tag Board Controller	Tag Board Controller (Portal Tag Board)	4680	
Underground fibre phone	Underground crib room	4690	

19.1.5 Environmental Emergency

Position	Who	Work Ext	Mobile
Mine Incident Controller	Environmental Advisor	4618	021 289 9001
Alternate Mine Incident Controller	Environmental Advisor	4609	021 396 210
Alternate Mine Incident Controller	Environmental Technician	4637	021 0239 2193

Link to share point phone list: Departmental%20Phone%20List.xlsx&action=default

19.2 Corporate Management

- Wilkes, Mick (President & CEO) 5305 +61 3 9656 5305 +61 419 372 381
- Holmes, Michael (Chief Operating Officer) 5303 +61 3 9656 5303 +61 427 964 607
- HELPDESK / ON CALL MOBILE 777 +64 3 479 4777 021 478 776

19.3 Dunedin

- (Executive Assistant) 4700 +64 3 479 4700
- **HELPDESK / ON CALL MOBILE** 777 +64 3 479 4777 021 478 776
- **Senior Corporate Counsel Commerical & Projects**
- Paul, Alison (Snr Corporate Counsel) 4716 +64 3 479 4716 021 396 178

19.4 EXTERNAL CONTACTS

19.4.1 Emergency Services

- Emergency 1 - 111
- Ambulance 1 - 111
- Fire Brigade 1 - 111
- Police 1 - 111

19.4.2 District Command Centre – Dunedin

- 03 471 5002
- 021 222 9421
- **dcc.southern@police.govt.nz**

19.4.3 Doctors

- Mornington Health Centre 1 - 03 466 5011
- Palmerston Health Centre 1 - 03 465 1445
- Palmerston Emergency Doctors 1 - 03 465 1444
- Waikouaiti Medical Centre 1 - 03 465 7599

19.4.4 Hospitals

- Dunedin Public Hospital 1- 03 474 0999
- Oamaru Public Hospital 1- 03 433 0290

19.4.5 National Poisons Information Centre

- Poisons and Hazardous Chemicals (urgent only) 1 - 03 474 7000
- Poisons and Hazardous Chemicals (non - urgent) 1 - 03 479 1200

19.4.6 WorkSafe NZ

- Michael Firmin (Inspector) 1- 03 395 3264 / 1- 0274356380
- WorkSafe NZ 24 hour 1- 0800030040
- 24 Hour Pollution Hotline 1 - 0800 800 033
- Palmerston Office 1 - 03 465 1194
- Dunedin Office 1 - 03 474 0827

19.4.7 Civil Defence & Rural Fire

- Dunedin 1 - 03 474 3879
- Oamaru Emergency Only 1 - 03 434 6400
- Oamaru Office 1 - 03 434 1644
- Macraes Rural Fire Officer (Jim Thomson) 1 - 03 465 2007
- Macraes Civil Defence Coordinator (Gavin Tisdall) 1 - 03 465 2493

19.4.8 Trust Power Ltd

- Head Office (Tauranga) 1 - 03 418 1600
- Lines Company (Balclutha) 1 - 03 418 4950
  Faults 1 - 0800 878787

19.4.9 New Zealand Mines Rescue

- Rapahoe Station 03 762 7828 (24hr emergency contact)

In the unlikely event that contact cannot be made via this number, the alternative contact details are:

- General Manager Mobile 021 366 500
- Training/Safety Officer Mobile 021 222 2092
- Training/Safety Officer Mobile 021 336 500

19.4.10 Available Air Support

- Central South Island Helicopters (03) 439 5656 or 027 457 0758
- Helicopters Otago (03) 489 7322

DEFINITIONS

Action Plan	A document that describes how the response will be managed and how response agencies will integrate their activities to achieve the response objectives. It is owned by the Controller, and developed by Planning with participation of all the functions and agencies activated.
Agency	This refers to: • government agencies, including public service departments, non-public service departments, crown entities, and offices of Parliament • local government bodies • non-governmental organisations • lifeline utilities.
CCCS	Critical Control Check Sheet
CIMS	See Coordinated Incident Management System
Debrief	A critical examination of an operation done to evaluate actions for documentation and future improvements.
EMCP	Emergency Action Control Plan
Emergency	An emergency is an unexpected event or series of circumstances that may endanger the health and safety of people and/or impact on the environment and/or cause damage or loss of equipment and production.
Emergency Coordination Centre (ECC)	A regional level CC that coordinates the regional response and provides support to local level responses.
Emergency Operations Centre (EOC)	A local level CC that coordinates the local response and provides support to incident level response activities.
Event	Realisation of a hazard
External Audit	An audit in which the lead auditor, at the least, has no constant operational ties to the mine
FRR	Fatal Risk Register is a broad brush risk assessment of all existing principal and major hazards and mitigating controls at the Macraes Operation
Haul Road	A purpose built road designed and constructed to carry heavy loads
Hazard	A source or a situation with a potential for harm in terms of human injury or ill health, damage to property, damage to the environment, or a combination of these
Heavy Mobile Equipment	Those vehicles used in the process of moving coal or overburden and/or the construction and maintenance of mine infrastructure. Includes haulers, low loaders, graders, water trucks, dozers and front end loaders
ICP	See Incident Control Point. Pronounced I-C-P.
ICT	see Information Communications Technology
Impact Analysis	An analysis of the hazards and environment, that aims to determine the most likely and the most dangerous scenarios for the hazard(s) to progress. These are critical in forming a proactive Action Plan and response.
IMT	See Incident Management Team. Pronounced I-M-T.

Incident	(1) An occurrence that needs a response from one or more agencies. It may or may not be an emergency. (2) The first official level of agency response (see 'incident level response').
Incident Action Plan	See Action Plan
Incident Control Point (ICP)	Single location where an Incident Controller and members of their IMT coordinate and manage response operations at an incident level response.
Incident Level Response	The first official level of agency response, carried out by first responders. Response personnel conduct physical actions such as clearing obstructed roads, treating casualties, fighting fires, conducting rescues, and delivering welfare services. They are supported and/or coordinated by the higher response levels.
Incident Management Team (IMT)	The group of incident management personnel that supports the Controller. Includes the Controller, the managers of Planning, Intelligence, Operations, Logistics, PIM and Welfare; it also may include a Response Manager, risk advisors, and technical experts.
Internal Audit	An audit conducted by the mine personnel
Intersections	Junctions where two or more roadways cross. Light vehicle roads are generally designed and constructed to cross haul roads at 90 degrees
Jurisdiction	An organisation's or agency's area of responsibility.
Lead Agency	The agency with the mandate to manage a particular incident. It may have this mandate through legislation, protocols or agreement, or because it has the expertise and experience in managing a particular hazard.
Liaison	A means of establishing personal communication between response agencies. Liaison Officers may attend the CC occasionally (External Liaison), or be present full-time (Attached Liaison).
Light Vehicles	These are vehicles used for the transportation of persons or minor logistical items. Personnel carriers and service and maintenance vehicles are also covered by this definition
Logistics	The functions that support a response through the provision of resources which help maintain the response plan and the affected communities.
Maintenance Equipment	Includes: tractors, cable reels, Cat IT machines, Franna crane, contractor cranes, and 15 tonne forklift
Management of Change	The process used to assess and assimilate all internally and externally driven changes in a routine but methodical fashion
Manager	The mine operator of a mining operation must appoint a person to: (a) manage the mining operation; and (b) supervise the health and safety aspects of the mining operation every day on which any mine worker is at work
Mine Operator	In respect of a mining operation carried out under a permit granted under the Crown Minerals Act 1991, the person appointed by the permit operator to manage and control the mining operation
Mine Worker	A person who works in a mining operation, either as an employee or as a self-employed person or contractor

Mobilisation	The processes of procuring or activating, assembling and transporting resources to an incident.
National Coordination Centre (NCC)	A national level CC that coordinates an agency's national response and provides support to regional offices responding to an incident.
National Crisis Management Centre (NCMC)	A permanent, generic national coordination facility for use by any national lead agency. It is intended to coordinate all-of-government responses.
Objective	A statement of what is to be achieved; best described as Specific, Measurable, Achievable, Relevant, and Time-bound (SMART).
OceanaGold	Oceana Gold (New Zealand) Limited
Operations	The function responsible for the coordination of the response, detailed task planning, and the implementation of the Action Plan. It is also responsible for coordinating volunteers and liaising with other agencies.
PCP	Principal Control Plan
PHMP-R&OVOA	Principal Hazard Management Plan – Roads and other Vehicle Operating Areas
PIM	See Public Information Management. Pronounced 'P-I-M'.
Planning	The function that prepares and updates Action Plans, and other plans such as long-term or contingency plans.
Principal Hazard	Any hazard that may have the potential to cause multiple fatalities
Public Information Management (PIM)	The function that, during an incident, prepares, distributes, and monitors information to and from the media and the public.
Readiness	One of the '4 Rs' of emergency management. Readiness means developing operational systems and capabilities before an emergency happens, including self-help and response programs for the general public, and specific programs for emergency services, lifeline utilities, and other agencies.
Resources	All personnel, supplies, facilities and equipment available, or potentially available, for assignment to incidents.
Response	One of the '4 Rs' of emergency management. Response means actions taken immediately before, during, or directly after an emergency to save or protect lives and property, and to bring the consequences of the emergency to a point of stability that allows Recovery to take over.
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 may have a positive or negative impact.
Risk Management	The culture, processes and structures that are directed towards realising potential opportunities whilst managing adverse effects
Road-Block	A barrier or obstruction preventing or limiting the passage of vehicles.
SitReps	see situation report
Situation Report	A brief description of an incident, usually given at regular intervals.
Situational Awareness	An understanding and appreciation of the complexities of an incident including an understanding of the environment, the situation, likely developments, and implications

SSE	Site Senior Executive
TARPs	Trigger Action Response Plans
Technical Expert	An adviser with specialist skills or knowledge that is needed to support incident operations.
Triage	A process for sorting patients according to severity of condition. Forward triage is a rapid assessment completed inside the inner cordon; it is followed by secondary triage which generally occurs in the casualty clearing area. Triage status usually determines the order and speed in which patients are taken to the treatment area and also helps priorities where and when patients will be taken to more definitive care.
Windrow	A continuous mound of loose material, of appropriate height, placed at the toe or crest of a slope as a barricade to falling objects or to prevent personnel/mine equipment from falling inadvertently down pit walls. Can also be referred to as a bund.

REFERENCES

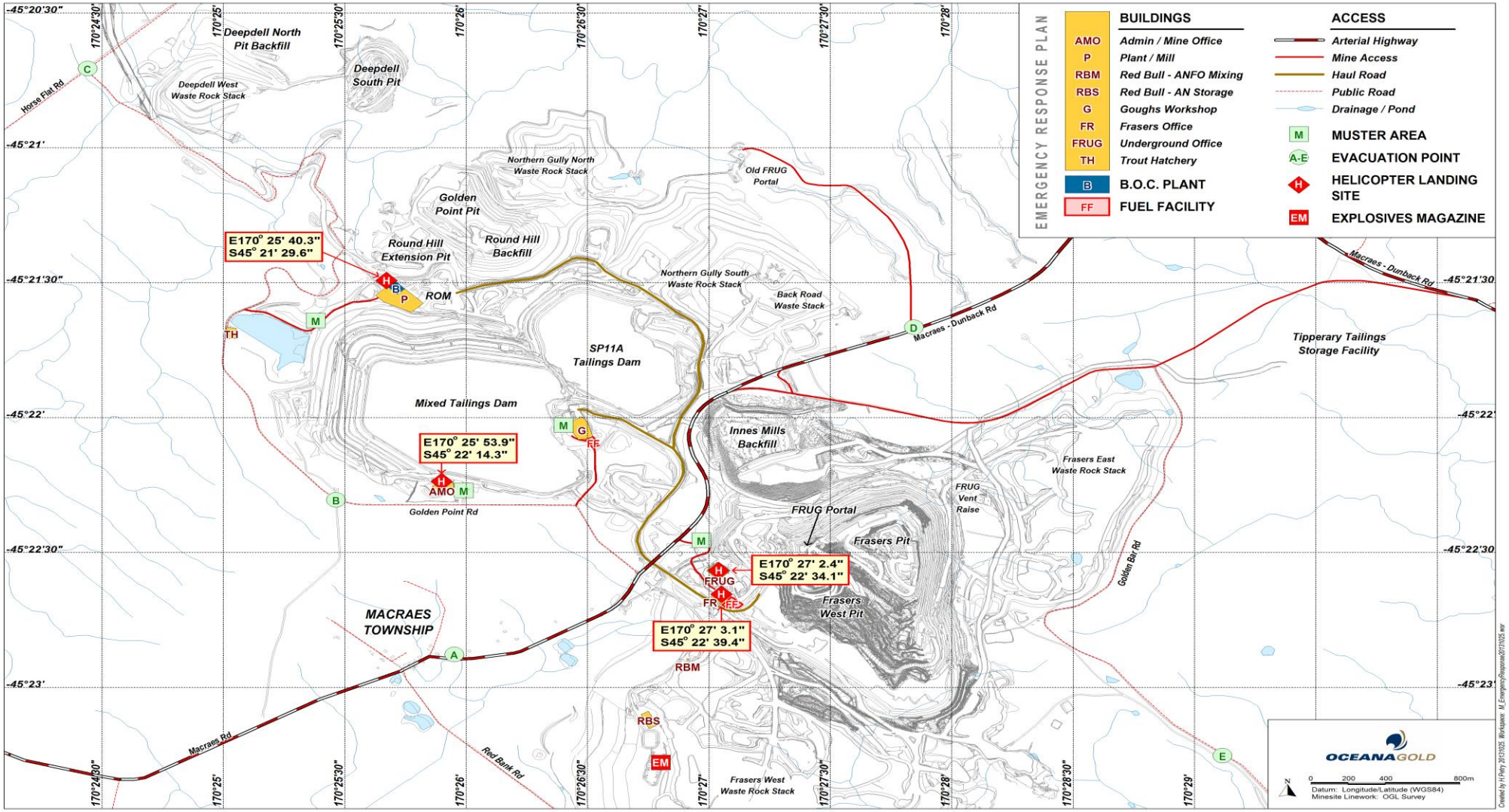
Listed below, is information that is directly related to the development of this document or referenced from within this document.

- OceanaGold 2014 (Health/Safety/Environment Compliance Standards Manual)
- Emergency Responce Plan Frasers West Explosives Reserve – RedBull Mining Services
- OGC Crisis Management Plan – January 2013 – REV 1
- CIMS (Co-ordinated Incident Management System)

APPENDIX A - ELECTRONIC COPY

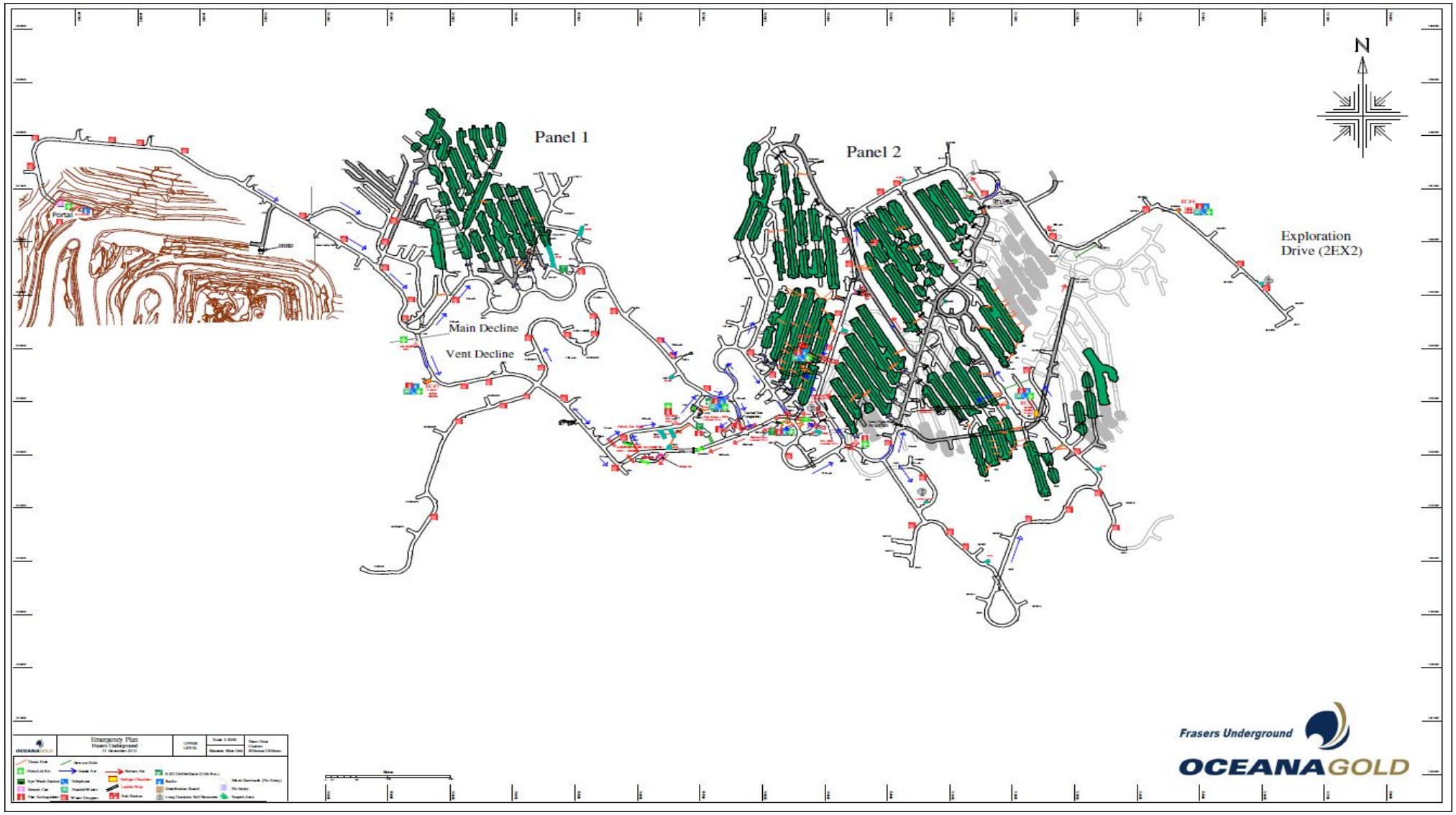
- Oamaru Police
- Dunedin Police
- Dunedin Central Command Centre
- Civil Defence Oamaru
- Dunedin Fire Brigade

APPENDIX B - EMERGENCY RESPONSE MAP

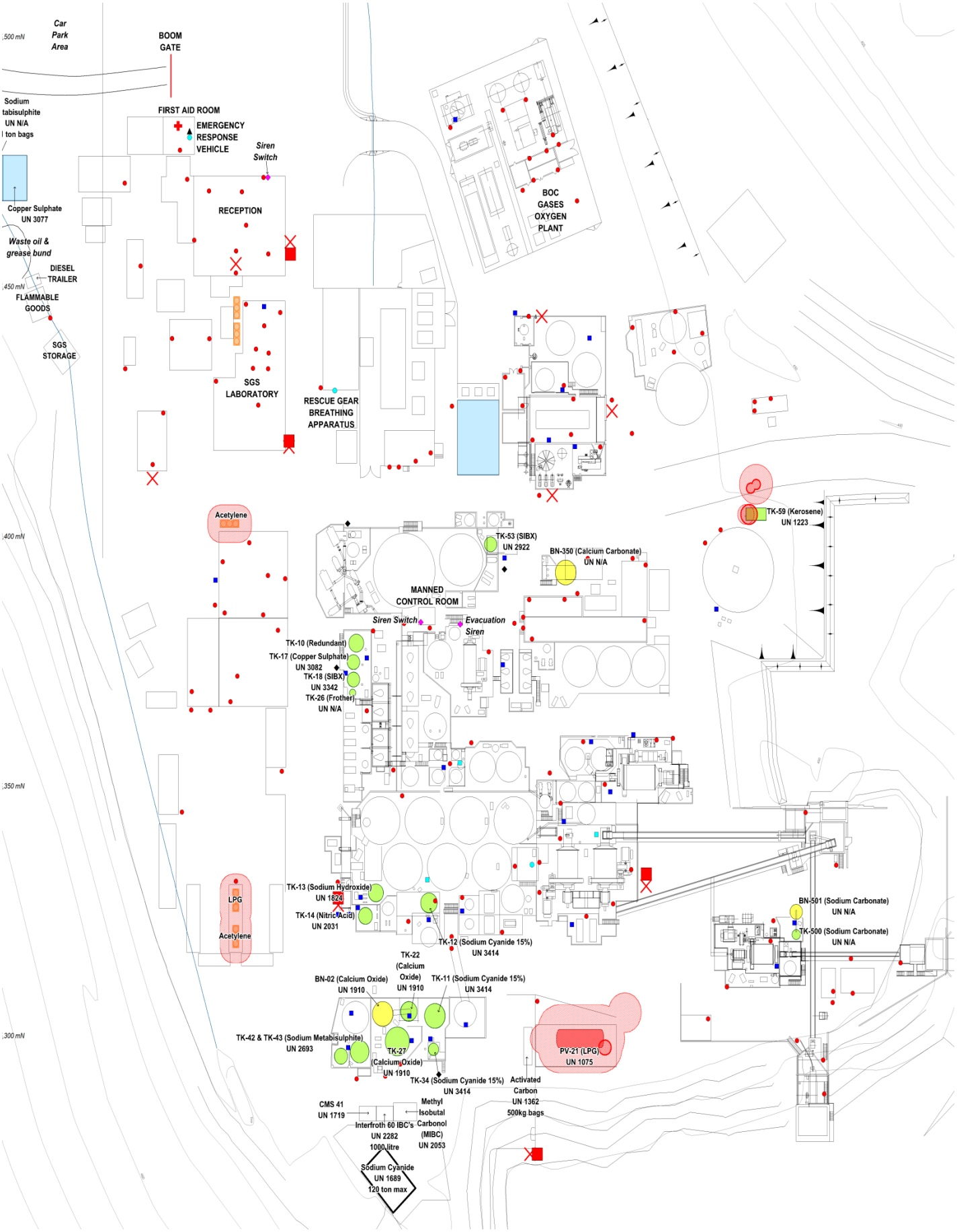


APPENDIX C - UNDERGROUND MINE PLAN

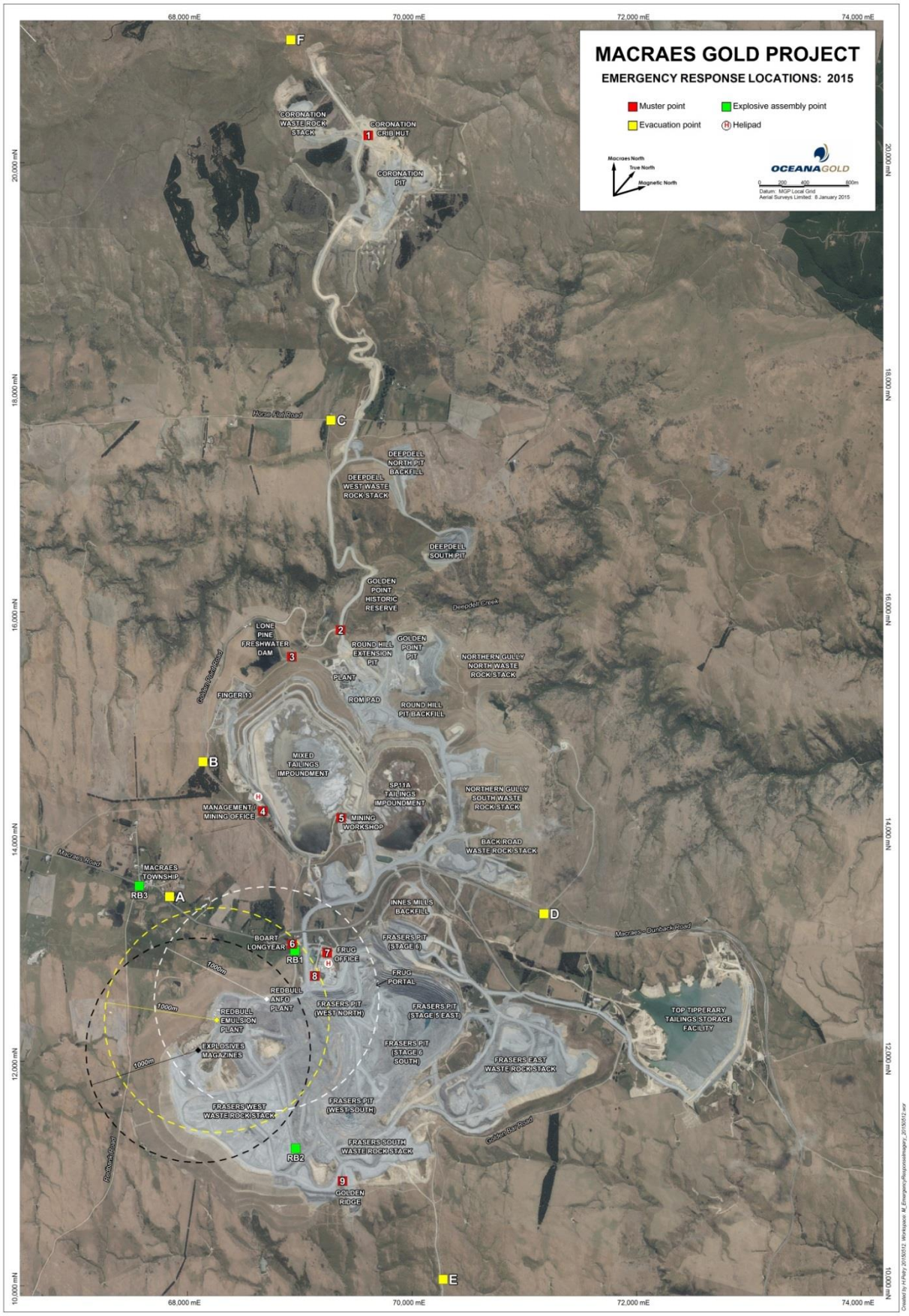
(Example only updated versions located in ICP's)



APPENDIX D - PROCESSING HAZARDOUS SUBSTANCES PLAN



APPENDIX E – MUSTER POINT AND EVACUATION POINTS



APPENDIX F – EXPLOSIVES EXCLUSION ZONES

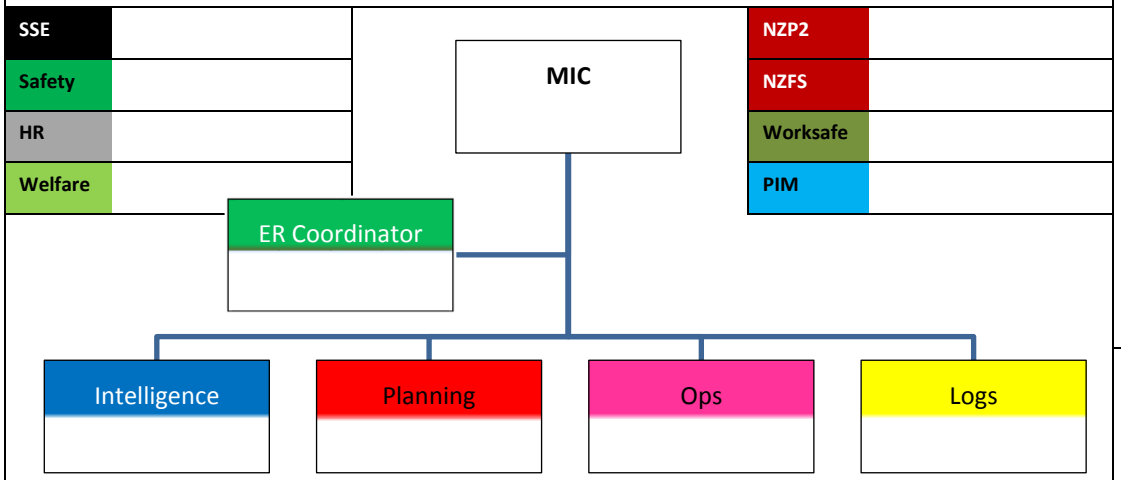
APPENDIX G – CORONATION LAYOUT

APPENDIX H – INCIDENT ACTION PLAN (IAP)

Log of actions and operational tasking		Communications Plan

Incident **Date:**

Time from: **Time to:**



Situation summary (brief circumstances and action taken)

Goal

Factors (that you need to consider when formulating a plan	**Priorities**	**Objectives** (what you want to achieve during this operational period – make them SMART)	**Strategies** (methodologies to achieve your objectives)	**Resource needs** (what you need to do the job)

Time	Actions/Operational Tasking	Initials		
				Safety plan (identify hazards and implement hierarchy of controls)
Approved				**Date/time**

APPENDIX I - SITUATION REPORTS - SITREP

Incident	Time	Date
	Prepared by	

Situation
Actions taken
Factors impacting on planning
Contingencies and long term planning

Approved	Date/Time

APPENDIX J - MACRAES EQUIPMENT INVENTORY

Description	Quantity
BG4 Long duration breathing apparatus sets	18
PA94 short duration breathing apparatus sets	14
Lifting Bags 4 @ 40t	4
High Expansion Foam Generators	1
Low Expansion Foam Branches	4
High Expansion Foam	150 litres
Low Expansion Foam	400 litres
Northern Lights	20
Stretchers	3
Altair Gas Detectors	4
Spare BG4 Oxygen cylinders	24
MARS Oxygen Therapy units	2
Oxygen Pumps (BG4 cylinder refill)	1
Compressor (max 350 bar)	1
RZ 25 Testers (BG4 test units)	1
Dräger Tester (CABA test unit)	1
Radios (Intrinsically safe)	8
Ropes (some ropes are stored in shed next to underground main escape way exit)	12
Harnesses	8
HSNO chemical suits	4
First Aid Trauma Equipment	
Multiple burns kit	
Multiple splints	
Penthrox – pain relief	
Defibrillator	
KED Back brace	
Spinal board	
Neck collars	
Various first aid supplies	
First Aid Trauma Equipment, Inc. burns, lacerations, eye packs, pain relief.	

Health and Safety Management System

Hazardous Substances

Document ID: MAC-257-PHM-007

Department:	Health, Safety, and Training
Location/Site:	Macraes Operations

	Position/Title	Name	Date
Authored by	HST Manager	Ash O'Halloran	7/9/2014
Reviewed by	Process Manager	Quentin Johnston	20/4/2015
Approved by	Site Senior Executive (SSE)	Dale Oram	4/6/2016

	Document Name	Document Id
Reference Documents	Health and Safety at Work (In Mining Operations and Quarrying Operations) Regulations 2016	Worksafe
	Health and Safety at Work Act 2015	Worksafe
	Operational Risk Register	MAC-251-REG-000
	OGC Corporate Health, Safety, and Environment Compliance Standards	OGC-450-STD-001-07
	Hazardous Substances and New Organisms Act 1996	Ministry for the Environment

Document Issuance and Revision History

Procedure Name: **Hazardous Substances**

Document ID: MAC-257-PHM-007

Revision No.	Revision Date	Section	Page	Description of Issuance or Revision	Effective Date
0	2012	All	All	New Document	2012
1	2015	All	All	Updated with legislation requirements	Aug 2014
2	2016	All	All	Update in line with new Legislative changes and comply with OGC corporate standards	July 2016

Table of Contents

1 INTRODUCTION

The Health and Safety at Work (Mining Operation and Quarrying Operations) Regulations 2016 states that the mine operator must ensure that the SSE develops, implements, and maintains a health and safety management system for the mining operation to comply with these Regulations.

The SSE must ensure that:

- a process is in place to assess the inherent risk of harm to mine workers from identified hazards at the mining operation and to identify the controls required to manage that risk; and
- the process is used when developing, implementing, and maintaining the health and safety management system, including, without limitation, each time the health and safety management system or any aspect of it is reviewed.

This Principal Hazard Management Plan – Hazardous Substances (PHMP-HS) describes how the Macraes Operation manages risks associated with the hazards of:

- transporting, handling and storage of hazardous substances

The PHMP-HS is a document authorised by the SSE and applies to all mine workers at the Macraes Operation and forms part of the OceanaGold health and safety management system as shown in Figure 1:

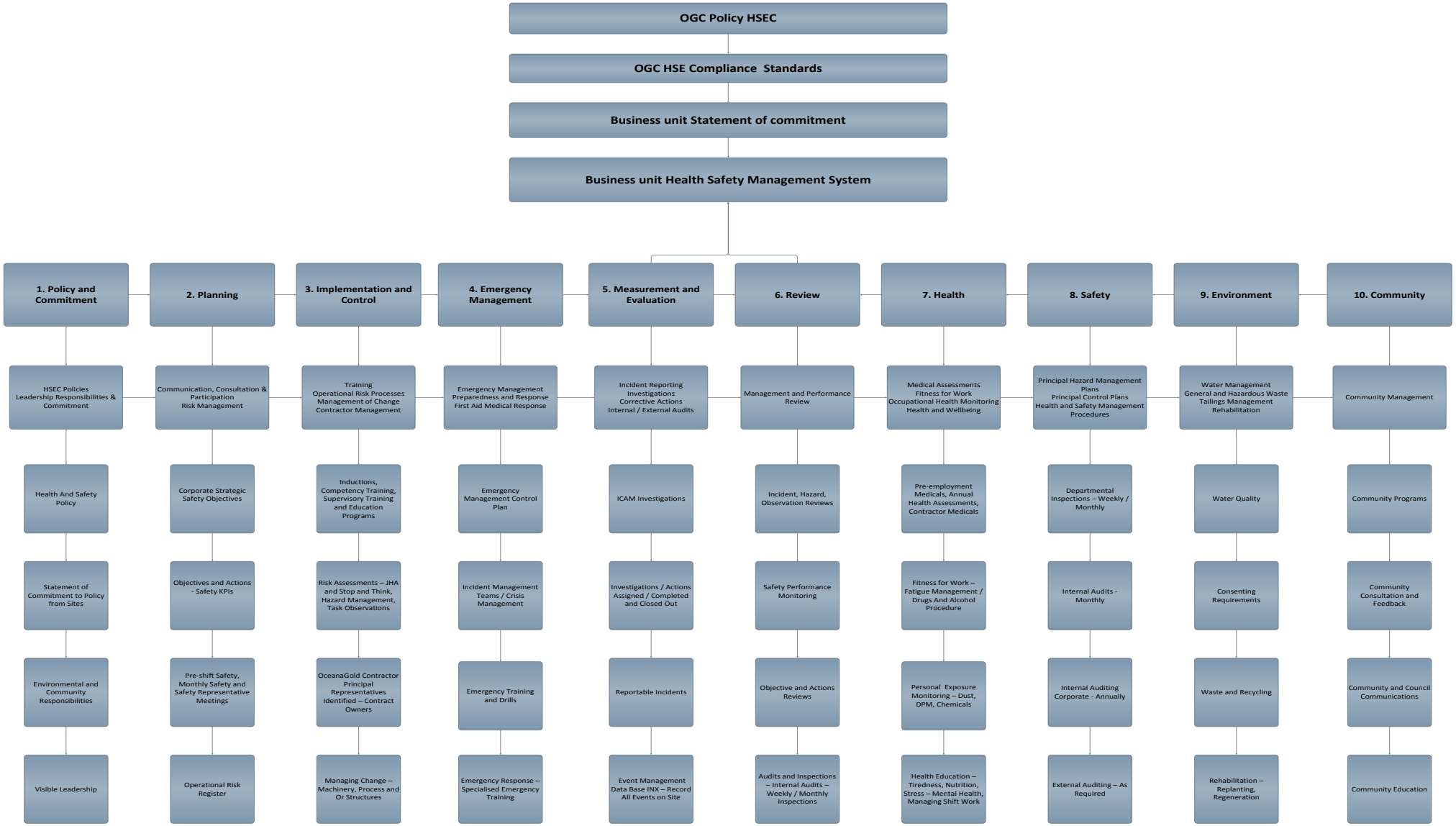


Figure 1: Health and Safety Management System Framework

1.1 Purpose

The purpose of the PHMP-HS is to identify, analyse, and assess risk associated with the identified principal hazards of hazardous substances used at the Macraes Operation. The PHMP-HS applies to the safe use, handling, storing and disposing of all hazardous substances at OceanaGold Macraes Operations.

The Macraes Operations recognises the hazards and risks of working with hazardous substances and aims to proactively manage and implement strategies to reduce the risk of exposure to associated hazardous substances. Health and Safety in the workplace is Macraes Operation's highest priority.

The Macraes PHMP-HS:

- is the enacting document through which risks associated with supply, storage, mixing, distribution, use and disposal of hazardous substances are managed;
- describes the fundamental hazards, procedures and responsibilities adopted by Macraes Operations to manage and control the associated risks;
- sets out the responsibility and accountability requirements of employees; and
- sets the minimum standard to which all staff are expected to comply.

1.2 Scope

The PHMP-HS is authorised by the SSE and applies to all mine workers in any capacity accessing the Macraes Operation.

The PHMP-HS will achieve this by documenting the strategies, systems and procedures that apply to the control of hazardous substances as listed below to ensure that all the tasks associated with all hazardous substances activities are conducted safely and efficiently.

- Identify the principal hazards associated with transport, handling and storage of hazardous substances in the mine environment;
- Identify the risk management strategies associated with hazardous substances hazards;
- Establish hazard control, prevention, and monitoring mechanisms;
- Identify triggers for risk management actions when principal hazards occur or are considered likely to occur, requiring urgent response in mining operations or urgent review of the Plan;
- Provide a basis for document control and management of change to ensure that any future changes to mining processes or activities are recognised and evaluated, and that the PHMP is appropriately updated; and
- Identify those mechanisms of audit and review to determine the adequacy and compliance with the PHMP and confirm that risk is being managed at an acceptable level.

2 NATURE OF PRINCIPAL HAZARD

Hazardous substances are used throughout the Macraes Operation on a daily basis, being a critical part of the mining process. Below is a summary of activities and impacts involving hazardous substances at the Macraes Operation.

2.1 Hazardous Substances Activities

Hazardous Substances	Description
Dangerous Goods (hazardous substances) transported to site	All hazardous substances are delivered to hazardous substances compounds located at the Macraes Operation. All companies used to transport hazardous substances must be on the preferred contractor register. This register assists the principal representatives track that all companies coming ion site comply with appropriate requirements.
Storage of hazardous substances at the Processing Plant	The plant has multiple storage locations of hazardous substances. Each are is certified by an Hazardous Substances and New Organisms (HSNO) approved certifier to authorise hazardous substance location test certificates for these locations.
Hazardous substances in workshops	Both the underground and Open pit workshops have requirements for hazardous substances to be stored, e.g. acetylene bottles. These storage areas are also approved under HSNO hazardous substance location test certificate.
Hazardous substances in Underground	There are two main types of hazardous substances stored in the underground environment, explosives, and diesel fuel.
Hazardous substances in Open Pit / Surface	The open pit has various locations where diesel, waste oil and various other substances e.g. LPG, engine degreaser, coolant, and compressed gases.
RedBull Mining Explosives Plant	RedBull mining use hazardous substances to manufacture explosives on the Macraes Mine. The plant holds various pre curses for the manufacture of ammonium nitrate and emulsion.

See appendix A for a layout of hazardous substances stored at the processing plant.

See appendix B for an example of the hazardous substance register for Macraes site. This is in conjunction with ChemAlert data base.

2.2 Incompatibles

Not all hazardous substances can be stored together safely. Different types of substances can cause a fire or explosion if they come into contact with each other. These substances are often described as “incompatible” and it’s important that they are stored separately to prevent the substances from mixing if a leak or spill were to occur.

The safety data sheet for a hazardous substance will tell you which substances and materials it should be kept away from, but the box below provides some general guidance.

2.3 Relationship Between Hazardous Substances and Dangerous Goods

Dangerous Goods are a sub-set of hazardous substances. Dangerous Goods are given a dangerous goods class diamond according to various attributes assigned to a particular class of chemicals. For example, acids are classified as dangerous goods ‘Class 8 Corrosive Substances’.

INCOMPATIBLE SUBSTANCES – GENERAL GUIDANCE

Hazardous substance type:	Keep away from:
Flammable gases (class 2.1.1)	Flammable aerosols (class 2.1.2); flammable liquids (class 3); class 4 substances; oxidising substances; organic peroxides (class 5).
Flammable liquids (class 3)	Flammable gases and aerosols (class 2); class 4 substances; oxidising substances; organic peroxides (class 5).
Oxidising substances (class 5.1)	All other types of hazardous substances (including organic peroxides).
Organic peroxides (class 5.2)	All other types of hazardous substances (including oxidisers).

By way of example, all substances within the larger circle are hazardous substances; only those within the smaller circle represent dangerous goods.

Dangerous Goods refers to hazardous substances being transported by road (refer definitions). These are each assigned a dangerous goods classification relating to the substances intrinsic properties as per the Globally Harmonised System of Classification (GHS).

2.4 Hazardous Substances Incidents and Injuries

Hazardous Substances can harm in a variety of ways, for example:

a) exposure to hazardous substances may be through the skin, by ingestion, by inhalation or fumes and vapours;

b) the use of some substances may result in the formation of an explosive, flammable, or toxic atmosphere;

c) the incorrect or inappropriate use of some substances may result in an adverse chemical reaction, including fire or explosion.

d) loss of containment may result in environmental damage and potential liability under the Resource Management Act.

2.5 Hazardous Atmosphere Zones

A hazardous atmosphere zone surrounds a place where flammable substances are used or stored and flammable vapours may be present. Within these zones, special precautions must be taken to prevent unintended ignition so that a fire or explosion does not occur.

2.6 Ignition Sources

Ignition - Ignition sources must be removed where flammable substances are used and stored. A table of common ignition sources is listed below.

2.6.1

Type of ignition	Example
Flames	• Welding flames, gas heaters, pilot lights
Sparks	• Welding arcs, starters for fluorescent lighting, electric • motors, electrical equipment like power points, cigarette • lighters, switches, telephones • Static electricity, including from friction sources • Lightning • Drilling, grinding, scraping of metal over concrete
Heat	• Hot surfaces including light bulbs, ovens, radiators or • heaters, flue pipes, vehicle engines and exhaust systems • (for example, forklifts) pumps and generators • Exothermic chemical reactions that generate heat

3 LEGAL AND OTHER REQUIREMENTS

3.1 Legislation

Compliance is mandatory for the requirements of the Health & Safety at Work Act 2015 and the HSNO Act 1996 and their associated Regulations. The Health and Safety Department monitors compliance with this legislation in association with external consultants.

Regular audits are undertaken to monitor mine site performance in relation to legislation, codes of practices, guidelines, and standards.

3.1.1 Hazardous Substances Regulations 2001 Part 2

Documentation for hazardous substances in places of work:

A person must comply with Regulations 39 to 46 when selling or supplying to another person a quantity of a hazardous substance of a particular hazard classification equal to or greater than that specified for hazardous substances of that classification in Schedule 2, if—

a. the person is satisfied on reasonable grounds that the other person is likely to use the substance in a place of work; and
b. the person has never previously—
    i. sold or supplied a quantity of the substance in that state to the other person in circumstances requiring compliance with Regulations 39 to 48; and
    ii. complied with those Regulations in relation to selling or supplying it.

3.2 HSNO Classes

Class 1 – explosives (note that this booklet does not provide information about 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

Dangerous goods class 6.2 (infectious substances) and class 7, radioactive materials, are not regulated under HSNO but must be managed under the HSAW Act 2015 when used and stored in the workplace

3.3 Certification of People

A person may need to verify their knowledge and skills to manage very hazardous substances, or to fill compressed gas containers. This section includes information and forms regarding:

- **Approved Handlers**: If you handle or store hazardous substances you may need an Approved Handler test certificate.
- **Approved Fillers**: Anyone filling compressed gas containers with gas must be an approved filler. This applies to all compressed gases, including air.
- **Controlled substance licences**: A Controlled Substance Licence (CSL) is required to possess certain explosives, vertebrate toxic agents or fumigants.

- **Test certifiers**: Test certifiers issue test certificates for people, sites and equipment to ensure that they are compliant with the regulations. Includes information on Test Certifier Performance Standards.
- **Periodic testers**: Periodic testers test and certify compressed gas cylinders.

3.3.1 Approved Handlers

Hazardous Substances stored in quantities exceeding those referred to in the relevant schedules of the Hazardous Substances (classes 1 - 5 Controls) Regulations 2001 and/or hazardous substances (classes 6, 8 & 9 Controls) Regulations 2001 will require that the site have an approved handler/s.

An approved handler is required to be available to ensure the hazardous substances are stored, used, and handled safely. Approved Handlers may also provide guidance and assistance to other people handling the substances.

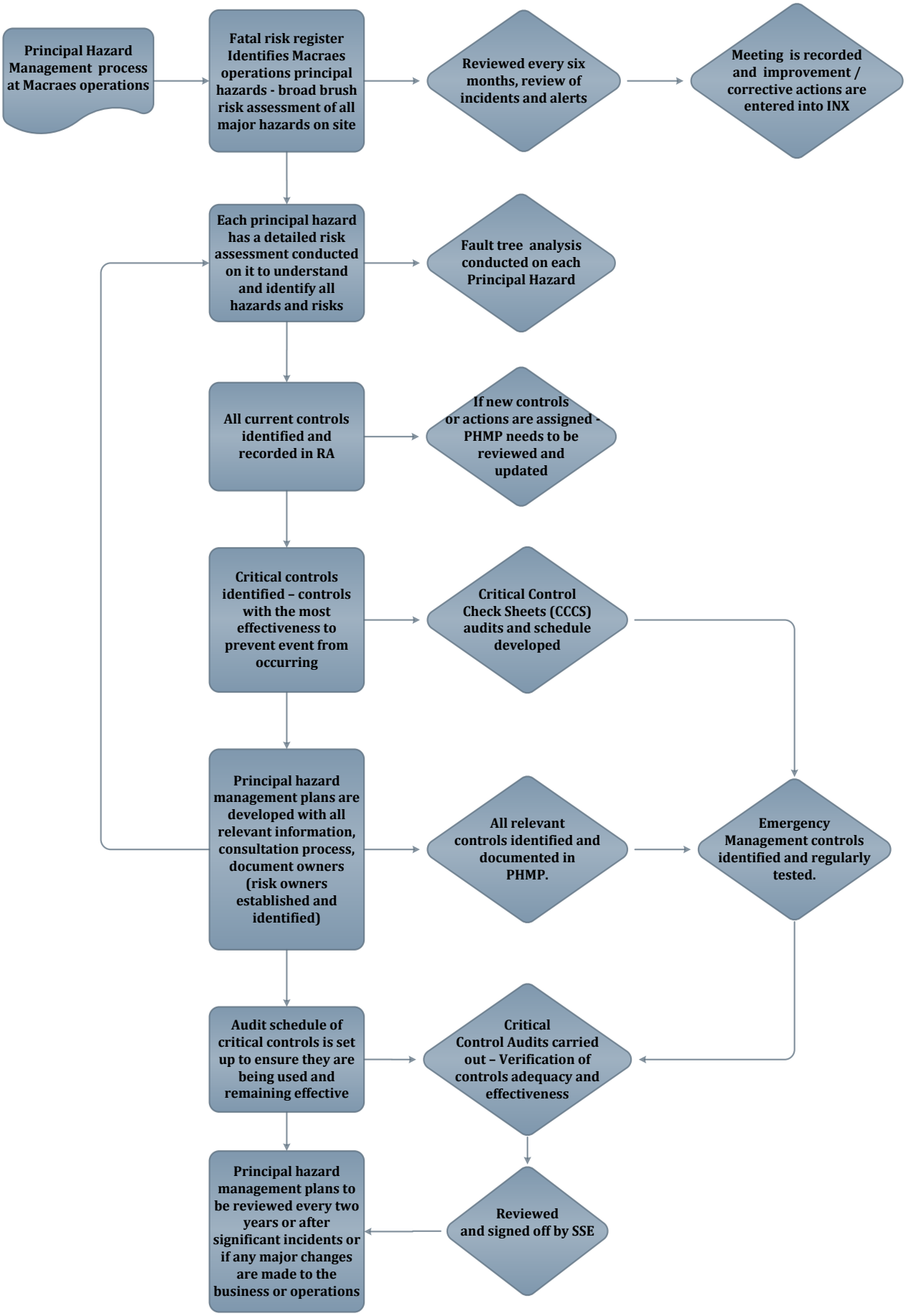


Figure 2: Principal Hazard Management Plan Overview

4 RISK ASSESSMENT

4.1 Risk Assessments Process

A series of risk assessments have been completed on explosive activities both in the underground, open pit and process plant environment at Macraes Operation.

- In 2013 a comprehensive risk assessment was conducted at the processing plant to identify all hazardous substances and associated controls. This risk assessment has been used to form the basis for this document.
- In April 2014 the Macraes Operation undertook a review of all the major hazards that exist at the mine. This process created the Operational Risk Register (ORR). This register is a broad brush risk assessment of all existing hazards and mitigating controls at the Macraes Operations. Each department undertook this process to identify corrective actions. Identified corrective actions are then entered into the Company's INX system and tracked to monitoring progress of completion.
- To mitigate the risks around hazardous substances activities associated controls and were clarified and critical controls were identified.

Methods of hazard identification used at the Macraes Operation include but are not limited to:

- task observations;
- reviews of accident/incident/near miss reports;
- risk assessments;
- job hazard analysis (JHA);
- reviews of injury/illness record;
- hazard awareness/identification training;
- personal risk assessment tools (e.g. Stop & Think);
- safety audits (critical Control Check Sheets);
- an INX event database; and
- external consultant advice.

5 CONTROL PROCEDURES

5.1 Management of Hazardous Substances

All controls for the hazards identified with hazardous substances activities are listed below. They are broken up into three categories: specific site controls, generic controls, and critical controls. Sections 5 and 6 outline these control measures.

Specific site controls are controls at department level that have been implemented to reduce the risk of the principal hazard. These include inductions, training, standard operating procedures (SOPs), procedures, management plans and inspections.

5.2 General

MACRAES OPERATION will use the ChemAlert system to classify hazardous substances. No hazardous substances may be brought onto an MACRAES OPERATION site without confirmation that such hazardous substances are approved for use at the MACRAES OPERATION. The approval will involve a two step process:

a. A request for a new hazardous substance to be used. This requires an assessment of transport, storage, use and disposal issues and precautions that need to be taken for the hazardous substance, the completion of the approval form (Appendix 5) and attaching the SDS for the substance.

   A hazard classification must be undertaken using the ChemAlert system. For all substances classified as High Hazard, a risk assessment must also be undertaken to determine the risk associated with its transport, storage, use and disposal.

b. Approval of the use of the hazardous substance. For all hazardous substances, the Departmental Manager must be satisfied that the risk is acceptable. For substances classified as High Hazard, approval shall only be granted after all of the risk controls that were identified in the risk assessment have been completed.

5.3 High Hazard Classification

All products in the ChemAlert system are classified **RED**, **AMBER** or **GREEN** according to the associated hazards and the potential risk of exposure.

- A **RED** rating means there is a **High Hazard** associated with the use of the product;
- An **AMBER** rating means there is a **Moderate hazard** associated with the use of the product; and
- A **GREEN** rating means there is a **Low Hazard** associated with the use of the product.

Whilst the Colour Rating system provides a rapid indicator of the potential effects of a specific hazardous substance, the effects of hazardous substances can be determined by many factors including:

- Physical and chemical properties such as volatility, solubility, pH, explosion limits and the flash point;
- Operational considerations such as method of application, volume used, route of exposure, concentration, duration of exposure, ventilation;
- Individual considerations such as sex and age, genetic and immunologic status, general health status and life style; and
- Environmental Considerations such as engineering controls, protective equipment, training, working procedures.

Any one, or a combination of these factors can have an effect on the exposure level and the toxic response. The specific information contained within each product record will enable you to consider these factors and ensure safe handling.

5.4 Risk Assessment

A Risk Assessment shall be prepared and implemented for substances identified to be a High Hazard as defined in Section 5.3

A record of the results of a risk assessment relating to the use of a hazardous substance shall be recorded by:

a. making a notation in the register of hazardous substances if no specific measures are necessary to control the risks associated with exposure to the hazardous substance; or

b. preparing a report on the risk assessment if specific measures are necessary to control the risks associated with exposure to the hazardous substance.

Approval for use of High Hazard substances will only be granted once evidence of all risk controls has been completed.

It is the responsibility of the Health and Safety Officer to ensure that a risk assessment prepared in relation to a hazardous substance that is used at the site is readily accessible to any employee or other person who could be exposed to that hazardous substance.

5.5 Risk Control

For all High Hazard substances, Macraes Operations will ensure that the risks associated with hazardous substances are assessed and controlled to ensure reduced operational exposure.

Where risk assessments indicate the need for controls, the following hierarchy of controls must be adopted:

i. elimination of the hazard/risk;

ii. substitution;

iii. isolation;

iv. engineering controls;

v. administrative controls; and then.

vi. minimisation (e.g. personal protective equipment).

Macraes Operations shall implement and maintain a register (ChemAlert) of all hazardous substances brought on site. The register shall include as a minimum:

a. A list of all hazardous substances used at Macraes Operations's place of work;

b. The relevant SDS (if any) for each of those hazardous substances including issue date or expiry date;

c. Manufacturer details;

d. Classification as a hazardous substance or not (yes/no);

e. Dangerous Goods UN Number (if assigned);

f. Maximum quantities held on site at any one time;

g. Location;

h. Approved for use on site.

i. Cross-reference to any specific risk assessment and notation of specific control measures necessary to control the risks associated with the substance.

The Department Manager must ensure that the register and SDS and are readily accessible to all employees who may be exposed to a hazardous substance whilst on site through the Company intranet and the ChemAlert system.

5.6 Process for a New or Change of Hazardous Substances

Macraes Operations shall ensure the following for all hazardous substances purchased and/or to be used on a trial basis at Macraes Operations:

a. The Macraes Operations 'Process for Approval' (Appendix 5 - Hazardous Substance Approval for Use Form) is used to assess hazards and ensure appropriate risk controls are implemented;

b. The hazardous substance is recorded on the list of approved hazardous substances (available in ChemAlert);

c. It is appropriately labelled;

d. A Safety Data Sheet (SDS) provided by the manufacturer or from 'ChemAlert' must be readily available to users of hazardous substances;

e. That every effort must be made to limit the number and types of hazardous substances required for use on site;

f. Priority is given (where possible) to sourcing alternative substances of a non-hazardous nature. (Note: there is no such thing as a safe hazardous substance); and

g. Where possible, the Macraes Operations shall purchase hazardous substances suitable for use on site without the need for decanting and with appropriate labels already attached.

No hazardous substances may be brought onto an Macraes Operations site without confirmation that such hazardous substances are approved for use at the Macraes Operations. The Departmental Manager must ensure any hazardous substance selected for use has been through the approval process using the attached Appendix *G - Hazardous Substance Approval for Use Form.*

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.

The following information must be read in conjunction with *Appendix 6 - Process for a New or Change of hazardous substances.* In summary, the steps involve:

- Check the Macraes Operations master hazardous substances register in ChemAlert to establish if the hazardous substances you require already has approval. If not, establish if there is a suitable alternative that is approved.
- If the hazardous substances is not in the system; complete the *Hazardous Substance Approval for Use Form* and obtain formal approval from the Purchasing/Warehouse, Environmental and Health and Safety heads of departments, and the Departmental Manager to proceed with the approval process.
- Submit the *Hazardous Substance Approval for Use Form* with the appropriate information to the appropriate persons for signoff. A Risk Assessment must be undertaken for substances classified as High Hazard.
- For approval of High Hazard substances, the risk controls from the Risk Assessment must be completed prior to approval being granted.
- Once approved, the requesting person shall be notified to action the requesting process for the hazardous substances to be purchased and brought onto site.

5.7 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.

Appropriate class placards shall be displayed whenever dangerous goods are transported. Appropriate licences are to be held when transporting dangerous goods.

5.8 Labelling of Hazardous Substances

A person who supplies a hazardous substance for use at a Macraes Operations site must ensure that any container of the hazardous substance is appropriately labelled in accordance with the hazardous substances (Identification) Regulations 2001 and that the label is not removed, defaced or altered. The user must ensure that any such label:

a. clearly identifies the hazardous substance;

b. sets out the name, address and telephone numbers (including the 24 hour emergency number), of the NZ distributor or supplier (refer hazardous substances (Identification) Regulations 2001);

c. discloses the hazardous substances name of each type I ingredient;

d. discloses the hazardous substances name of each type II ingredient or, if the identity of the ingredient is commercially confidential, its generic name.

e. provides basic health and safety information about the substance, including any relevant risk phrases and safety phrases.

NOTE: If the container to be labelled is so small that it is not practicable to include all the particulars it is sufficient if the label complies with a) and b).

A container into which a hazardous substance is decanted for use within the next 12 hours (continuous) need only be labelled with the product name and the relevant risk phrases and safety phrases (see Appendices 1 and 2) and a container into which a hazardous substance is decanted for immediate use need not be labelled, so long as it is cleaned immediately after it has been emptied of the substance.

5.9 Storing Hazardous Substances

The Macraes Operations shall store and require its contractors to store, whilst on a Macraes Operations site, hazardous substances according to the requirements of the relevant Legislation, Codes, Standards and SDS. No product shall be used or brought onto an OceanaGold controlled site until a current Safety Data Sheet is available for the product (i.e. the date shown on the SDS is not older than five years).

The SDS must be readily accessible at the point of storage, usage or decanting.

The SDS must be reviewed to ensure:

a. Appropriate storage practices. For example, aerosol cans must not be stored in direct sunlight;

b. Incompatible substances are not stored together;

c. Toxicity of substance. For example what Risk and Safety Phrases apply to the substance;

d. Physical properties of the substance. For example is a gas heavier than air therefore capable of accumulating at ground level; volatility of the substance when exposed to air etc;

e. Personal protective equipment requirements;

f. Appropriate first aid response is available. For example, emergency shower;
g. Storage is as per SDS recommendation. For example, stored out of direct sunlight; and

h. Emergency response requirements.

Storage areas are to be constructed according to applicable Australian and/or New Zealand Standards. For example: AS 1940 - Storage and Handling of Flammable Substances and dangerous goods; and AS/NZS 1841 (Set) - Portable Fire Extinguishers.

Hazardous substances storage areas and entrances to the site and buildings shall include signage appropriate to the class of substance being stored and/or used in that area.

An Emergency Management Control Plan (EMCP) shall be prepared and located at the main entrance to each site in an effort to assist and enhance rapid response to an emergency involving hazardous substance. The Plan shall be prepared in accordance with the provisions of the hazardous substances (emergency management) Regulations 2001.

5.10 Mixing and Distribution Systems of Hazardous Substances

Critical to the safe use of hazardous substances is the confidence that the systems implemented for mixing and distribution be designed, constructed and maintained to an appropriate standard. This equipment must be assessed on the Hazard/Risk matrices and appropriate controls implemented to minimise any potential exposure to the hazardous substances. It must also meet all legal requirements.

5.11 Using Hazardous Substances

In addition to the articulated requirements of relevant legislation and standards pertaining to the use of hazardous substances Macraes Operations and its contractors shall also use hazardous substances according to directions given on the SDS that applies to the substance. The SDS shall be made readily available for personnel for reference purposes. An SDS from an Original Equipment Manufacturer shall not be altered.

Hazardous substances used in confined spaces must conform to AS/NZS 2865 - Safe Working in a confined space.

Any substance found to be incorrectly stored must be reported as an incident.

5.12 Decanting of Hazard Substances

The types of containers to be used for decanting hazardous substances must be those are advised on the SDS for each substance.

5.13 Prohibited Use of Hazardous Substances

The Department Manager and contractors shall ensure that a hazardous substance of the kind set out in **Table 1** is not used for a purpose referred to in Column 2 for that hazardous substance.

Table 1: Prohibited Use of Hazardous Substances

Hazardous Substance	Prohibited Use
Column 1	**Column 2**
Arsenic or its compounds	Spray painting
Asbestos in the form of chrysotile	All purposes, including the purpose of replacing an item including chrysotile with another item including chrysotile, but not for the purpose of:(a) research or analysis, or(b) being removed or disposed of, or being handled for storage or stored awaiting disposal, or(c) a historical or educational display of an item consisting of or including chrysotile
Asbestos in the form of crocidolite, amosite, fibrous anthophyllite, tremolite or actinolite	All uses, except for the purpose of sampling or analysis, maintenance, removal, disposal, encapsulation or enclosure
Benzene (benzol), if the substance contains more than 1% by volume	Spray painting
Carbon disulphide (carbon bisulphide)	Spray painting
Crystalline silicon dioxide (sand)	An abrasive in abrasive blasting A constituent of steel casting moulds, when sufficient quantities of suitable alternative non-siliceous materials are available A constituent in parting powders and facing powders used in foundry work A constituent in paints used on the surface of moulds or cores
Methanol (methyl alcohol), if the substance contains more than 1% by volume	Spray painting
Tetrachloroethane	Spray painting
Tetrachloromethane (carbon tetrachloride)	Spray painting

5.14 Disposing of Hazardous Substances

The Macraes Operations shall dispose of hazardous substances in accordance with the hazardous substances (Disposal) Regulations 2001, and according to the directions given on the SDS for the substance consistent with Territorial Local Authority waste disposal practices.

5.15 Approved Handlers

5.15.1 Requirements to be an Approved Handler

To obtain an approved handler Test Certificate, you need the knowledge, experience, and competence for the substances to which your approved handler certificate relates.

You will need to demonstrate your knowledge of the substance(s) your certificate will cover, including:

- Hazards of the substance and how to protect people and the environment. This includes the substance classification, Regulations about safe handling, including codes of practice, and what to do in an emergency.
- Working knowledge of any operating equipment, including the protective clothing and safety equipment, required to handle the substance safely.
- The controls imposed by the HSNO Act and what the law is trying to achieve.

The details of what you must know are set out in the hazardous substances (Personnel Qualifications) Regulations 2001 on the New Zealand legislation website.

5.16 Providing Evidence of Competence

The Test Certifier will need evidence of competence. The evidence must describe how knowledge and skills were assessed and the results of that assessment. It may be obtained from:

- **Training providers** - If trainees complete a relevant training course, this can be used as evidence. It must be signed by the trainer issuing the qualification.
- **Work supervisors** - If trained at work, a supervisor or manager can provide evidence for trainees.

5.16.1 Hazardous Substances Under the Control of an Approved Handler

Hazardous substances under the control of an approved handler can be handled by persons who are not an approved handler provided that the approved handler:

- is present at the location (for acutely toxic substances);
- has provided guidance to the person handling the substance; and
- is available, at all times, to provide assistance whilst the substance is being handled.

NOTE: “Available” means by electronic means or in person within a reasonable period of time.

5.17 SDS

A SDS is designed to protect the health and safety of people and the environment in the workplace. An SDS provides information on the hazards of substances and how they should be safely used, stored, transported and disposed. An SDS also describes emergency procedures, such as what to do in the event of a spill or fire.

5.17.1 SDS must be Available

The hazardous substances Regulations require that each workplace has a SDS available for each hazardous substance that is present in excess of the relevant threshold quantity. In reality, regardless of the quantities, it is best practice to have an SDS for each hazardous substance. Along with the product label, the SDS is the most important means of conveying safety information.

5.17.2 Information Required on the SDS

The SDS must include information under each of the following headings:

1. Product and Company Identification
2. Hazard(s) Identification

3. Composition and Information on Ingredients
4. First Aid Measures
5. Fire-Fighting Measures
6. Spillage, Accidental Release Measures
7. Handling and Storage
8. Exposure Controls and Personal Protection
9. Physical and hazardous substances Properties
10. Stability and Reactivity
11. Toxicological Information
12. Ecological Information
13. Disposal Considerations
14. Transport Information
15. Regulatory Information
16. Other Information

The information on the safety data sheet must be immediately available to a person handling the substance. At Macraes Operations, use of a hazardous substance is not permissible without having immediate access to an SDS.

5.18 Security

The Macraes Operation is set up to secure the mining areas from unauthorised access. This is done through boom gates for vehicles entering mining areas and turnstiles for personal entering specific mining areas. All other areas are fenced and sign posted “No unauthorised entry”. To get access to boom gates and turnstiles an access card is required. Access cards are only issued once the personnel have completed the relevant induction processes and have been authorised by their Department Manager to enter specific areas within the operation.

All areas where hazardous substances are stored must be kept in secured and lockable areas. hazardous substances are not to be taken off the Macraes Operation without appropriate permission and correct hazardous substances carrying licences. This includes hazardous substances vehicles. Only authorise personnel shall have access to the hazardous substances areas and vehicles.

5.19 Documentation

5.19.1 Providing an SDS and Ensuring it is Compliant

The seller or supplier of a hazardous substance must supply an SDS if;

- requested to do so;
- the substance being sold or supplied to a workplace is above the relevant threshold quantity; and
- they had not previously supplied a SDS for that substance.

The seller or supplier is also responsible for ensuring the SDS is compliant.

5.19.2 Person in Charge

The Person in Charge of the workplace must ensure that an SDS is present for each hazardous substance and available to workers, where threshold quantities are exceeded. An SDS must be readily available to a person handling the substance.

5.19.3 If a SDS is not Compliant

In the first instance you should contact the supplier and advise them of the reason for the non-compliance, thus providing the opportunity for them to remedy the non-compliance. Also, contact your immediate supervisor and if necessary, the Departmental Manager.

5.19.4 Updated SDS's

Although it is not a legislative requirement, it is best practice for a SDS to be revised every five years. An SDS must be updated if there is new information available on the substance, including its hazardous properties and any relevant health and safety information.

5.20 Location Test Certificates

A Location Test Certificate is required when quantities of classes 1 - 5 substances held at a site exceed the threshold quantities contained in the relevant schedules of the Hazardous Substances (classes 1 - 5 Controls) Regulations 2001.

Classes 6, 8 & 9 substances do not require a Location Test Certificate in any quantity but will need to meet the various controls outlined in the hazardous substances (classes 6, 8 & 9 Controls) Regulations and other related HSNO Regulations.

5.21 Hazardous Substance Location

A hazardous substance location exists where classes 1 - 5 substances are stored or used and the quantity exceeds the thresholds specified in the legislation.

For example, a hazardous substance location exists where you hold more than:

- 100 kg of LPG; and
- 50 litres of petrol.

To check whether a hazardous substance location test certificate is required for the substances stored and/or used on the site, you should contact your Health and Safety Officer who will engage the Test Certifier.

5.21.1 Obtaining a Location Test Certificate?

The Person in Charge must engage an EPA-approved Test Certifier to obtain the Location Test Certificate. MACRAES OPERATION have engaged a Test Certifier who will be able to assist.

5.21.2 Stationary Container Test Certificates

Stationary tanks or process containers that hold hazardous liquids or gases over a specified quantity require a Stationary Container System Test Certificate.

The Location Test Certificate shows that the stationary container system meets relevant legislative requirements for use, i.e. Schedule 8 of the Hazardous Substances (dangerous goods and Scheduled Toxic Substances) Transfer Notice, 2004.

5.21.2.1 Stationary Container System Test Certificate

The Person in Charge is responsible for ensuring that Stationary Container System Test Certificates are obtained where appropriate. An EPA-approved Test Certifier can issue these.

5.21.3 Test Certificate Revocation

A Test Certificate may be revoked if it was obtained by fraud or the holder has been negligent or incompetent.

5.22 Monitoring Measurement and Evaluation

The Workplace Exposure Standards (WES) is an important tool for monitoring the workplace environment. Where hazardous or toxic substances exist in the same environment as workers, and the employer is unable to

successfully eliminate or isolate these substances from working environments, he or she is required to minimise and monitor employee exposure.

5.23 Health Surveillance

The Macraes Operation and its contractors shall ensure that an employee who is potentially exposed to a hazardous substance will be provided with health surveillance if there is a risk to the health of the employee as a result of that exposure, and:

a. the hazardous substance is referred to in Table 2 (below); or

b. the exposure to any other hazardous substance is such that:

i) an identifiable disease or other effect on health may be related to the exposure; and

ii) there is a reasonable likelihood that the disease or other effect on health may occur under the particular conditions of work; and

iii) there is available an effective technique for detecting indications of the disease or other effect on health.

5.24 Biological Monitoring

The type of health surveillance needed should be carefully considered. The types of procedure which may be followed include:

- Biological exposure monitoring, for example, measurement and assessment of substances hazardous to health or their metabolites in blood, urine, or expired air (biological monitoring may be complementary to atmospheric monitoring);
- Biological effect monitoring, the measurement of early biological effects in exposed workers;
- Medical tests;
- Medical examinations;
- A review of present and past medical and work history, including occupational exposures;
- Self-reporting of symptoms; and
- Examination by a suitably qualified person (e.g., an occupational health nurse).

These procedures are not mutually exclusive and the results from one procedure may indicate the need for another. Non-invasive methods of testing, for example, analysis of expired air are generally preferable to invasive methods, for example, blood analysis, where equally meaningful results can be obtained.

5.24.1 Confidentiality

Macraes Operation shall maintain the confidentiality of individual medical records of all employees past and present. Employers shall ensure that all information that identifies or discloses information about any individual employee is removed from any monitoring results given to other employees.

5.24.2 Consent

Macraes Operation shall ensure that informed consent (refer to *Appendix 9 - Informed Consent Form*) for health surveillance is sought from an employee before health surveillance commences. Consent to monitoring should be separate from that given for any other medical treatment. **Table 2** outlines the indices and determination methods of the various contaminants that health surveillance may include.

Table 2: Biological Exposure Indices

Exposure	Determinant	Sampling Time	BEI
Acetone	Acetone in urine	End of shift	50mg/litre
Arsenic	Sum of inorganic arsenic metabolites	End of shift at end of work week	100µg/litre
Cadmium	Cadmium in blood	Not critical	0.044µmol/litre (5µg/litre)
	Cadmium in urine	Not critical	5µmol/mol creatinine (5µg/g creatinine)
Carbon monoxide	Carboxyhaemoglobin in blood	End of shift	3.5% of haemoglobin
Chromium (VI) water-soluble fume	Chromium in urine	End of shift at end of work week	0.6µmol/litre (30µg/litre)
Cobalt	Cobalt in urine	End of shift at end of work week	15µg/litre
2-Ethoxyethanol and 2-Ethoxyethyl acetate	2-ethoxyacetic acid in urine	End of shift at end of work week	100mg/g creatinine
Fluorides	Fluoride in urine	Prior to shift	160µmol/litre (3mg/litre)
		End of shift	530µmol/litre (10mg/litre)
n-Hexane	2,5-hexanedione in urine	End of shift	5mg/litre
Lead (inorganic)(2010)	Lead in blood	Not critical	See section on Lead Biological Indices
	Lead in urine	Not critical	0.72 µmol/litre (150µg/litre)
Mercury	Mercury in urine	Not critical	0.25µmol/litre (50µg/litre)
Methyl alcohol	Methyl alcohol in urine	End of shift	15mg/litre
Methyl ethyl ketone (MEK)	MEK in urine	End of shift	2mg/litre
Methyl isobutyl ketone (MIBK)	MIBK in urine	End of shift	2mg/litre
Organophosphates	Cholinesterase activity in blood		**Recommended Action** If less than 60% of Baseline: suspend from working with pesticides which inhibit cholinesterase activity
			If less than 80% of Baseline: repeat test to confirm result
			If greater than 75% of Baseline: permit a previously suspended worker to recommence normal duties
Pentachlorophenol (PCP)	Total PCP (including conjugates) in urine	Prior to last shift of week	1mg/litre
Phenol	Total phenol in urine	End of shift	250mg/g creatinine
Sodium fluoroacetate (1080)	Sodium fluoroacetate in urine	End of shift	15µg/litre
Styrene	Mandelic acid in urine	End of shift	1g/litre
Trichloroethylene	Trichloracetic acid in urine	End of work week	100mg/litre
Xylene	Methylhippuric acid in urine	End of shift	1.5g/litre

5.25 Air Quality Monitoring

Air quality monitoring may be carried out where it is necessary:

- To obtain a quantitative estimate of a person's exposure to substances hazardous to health; or
-
- To determine the efficiency and effectiveness of measures introduced to control exposure to substances hazardous to health.

A competent person to undertake monitoring air quality monitoring should only be carried out by a competent person who has sufficient knowledge, skills, and experience in the appropriate techniques and procedures, including interpretation of the results.

(1) Storage of Results

The results of monitoring should be kept whilst the operation of process continues. Where the employer is no longer associated with the process that required the monitoring to be carried out, the records should be made available to the nearest office of the Workplace Health and Safety service of the WorkSafe NZ.

(2) Access to Monitoring Results

The results of air quality monitoring should be provided to those employees with the potential for exposure to the substances monitored.

Records of such monitoring, with personal identifiers removed, should be readily accessible to all employees.

5.26 Generic Controls

Generic controls are controls that have been formalised across the site and are a part of the overall safety management system for the mine.

Associated controlled documents detail and formalise the controls and the Safe System of Work:

Document ID	Document Name
MAC-257-PCP-000	Electrical Management Plan
MAC-257-PCP-001	Mechanical Engineering Management Plan
MAC-257-PCP-002	Ventilation Management Plan
MAC-256-PCP-000	Worker Health Management Plan
MAC-257-PHM-000	Ground Control Management Plan - Underground
MAC-257-PHM-001	Ground Control Management Plan Open Pit
MAC-257-PHM-002	Inundation and Inrush
MAC-257-PHM-003	Roads and Other Vehicle Operating Areas
MAC-257-PHM-004	Tips, Ponds and Voids
MAC-257-PHM-005	Fire and Explosion Management Plan
MAC-257-PHM-006	Explosives Management Plan
MAC-257-PHM-007	Hazardous Substances Management Plan
MAC-257-PHM-008	Lifting Operations
MAC-257-PHM-009	Working at Heights
MAC-257-PHM-010	Confined Space Management Plan
MAC-257-PHM-011	Tyres and Rim Management
MAC-257-PRO-000	Traffic Management Plan - Surface
MAC-257-PRO-001	Traffic Management Plan - Underground
MAC-257-PRO-002	Road Closure
MAC-257-PRO-003	Isolation and Tagging Management Plan

6 CRITICAL CONTROLS

A critical control is a control that will have the greatest impact on preventing the risk(s) relating to the principal hazard from occurring, or if the risk was to occur the critical control would provide the greatest mitigation of the potential consequences.

This approach was taken to maintain focus on the high level controls that, if removed, would lead to the top event. Therefore, there is a conscious exclusion of the low level generic type controls as these would be identified and form part of the procedural documentation that also form part of the PHMP-HS.

6.1 Audit Process

An audit process has been implemented to ensure controls systematically identified and deemed critical to maintaining the integrity of the PHMP, are regularly conducted, thereby ensuring security and effectiveness of all measures. The Critical Control Check Sheet (CCCS) is the audit tool for regularly testing the effectiveness of internal procedures and controls. The CCCS will be utilised at a frequency as determined by the Macraes Senior Management Team and will be based on the completed reviews and analysis of the principal hazard.

6.1.1 CCCSs

The CCCS has been developed as an audit tool to monitor and review procedures and processes established to prevent or reduce the principal hazard to an acceptable level. Information generated through the auditing using the CCCS will provide evidence of conformance or non-conformance.

6.1.2 Critical Controls Identified

Failure Mode	Critical Controls
• Untrained personnel handling hazardous substances	• All personnel transporting or handling hazardous substances are to have HSNO approved handlers certificate
• Inappropriate hazardous substances storage areas	• Storage certified areas – current • Suitable for type stored • Secure • Well ventilated • Has emergency response plan in place if required • Suitably separated from ignition sources • Fire extinguishers available
• Inappropriate transport of hazardous substances	• Vehicle inspections and requirements in place and carried out
• Loss or theft	• Accounting process – including sign in and out of hazardous substances
• Incorrect transport of hazardous substances	• Safety Inspections and observations carried out on hazardous substances works,
• Poor management of hazardous substances	• Appropriate transport, storage, manufacture, and application inspection, auditing and checklists • HSNO register current • CHEMALERT is up to date
• In adequate training of personnel, unskilled personnel	• Training and competency of operators – DG licences when appropriate, Approved Handlers Certificates
• Inadequate or no SDS in place to management hazardous substances	• CHEMALERT functional and up to date. • Hard copies of SDS up to date
• Poor emergency response involving hazardous substances	• Review ER capabilities for HSNO response

7 EMERGENCY MANAGEMENT CONTROL PLAN

7.1 Trigger Action Response Plans (TARPs)

The EMCP includes specific TARPs which define triggers that necessitate specific actions to be taken in an emergency event. The TARPs shall be authorised by the HS&T Manager and are subject to approval by the SSE.

The HSNO emergency management requirements are primarily found in the hazardous substances (emergency management) Regulations 2001. These Regulations list three levels of emergency management and depend on the quantities of hazardous substance that are held:

Level 1: Relates to the substance:

- Information such as first aid directions or contact details for emergency response on labels; and
- Not subject to test certification.

Level 2: Relates to the workplace:

- Documentation such as an SDS, should be made available so that people know in advance the properties of the substance and what to do in an emergency;
- Fire extinguisher requirements; and
- Assessed as part of a Test Certificate.

Level 3: Relates to the wider area of involvement:

- Signage requirements;
- Emergency Management Control Plan;
- Secondary containment or bunding, to contain spills; and
- Are reviewed as part of issuing of the Location Test Certificate.

An ‘Emergency Management Control Plan has been prepared for the Macraes Operation in accordance with Regulations 25 – 34 of the hazardous substances (emergency management) Regulations 2001.

Refer to Emergency Management Control Plan MAC-253-PCP-000

8 RESPONSIBILITIES AND ACCOUNTABILITIES

Detailed roles and responsibilities relating to this PHMP are included in the Macraes Operations Management Overview Plan.

The document owner, in order to achieve the objectives of the PHMP-HS, shall manage the process for the purchase and subsequent ongoing maintenance of any specific item required as a critical control for the identified principal hazard.

Role	Accountability
All Mine Workers/ Contractors	• Present to work unimpaired and able to undertake their job safely • Follow instruction on hazardous substances follow relevant SOPs for the specific task being carried out • Obtain appropriate approval to transport, handle and use hazardous substances for your area • Follow instruction on SDS for all hazardous substances • Do not bring any unapproved substances onto site • Do not use unapproved substances. • Obtain appropriate approval using the hazardous substances Approval for Use Form. • Report all potential hazards to a supervisor immediately
Managers	• Ensure that the PHMP-HS is understood by all personnel and used as the primary tool to manage risks/hazards associated with hazard substances. • Ensure that a system is in place and functioning for approving the use of all hazardous substances prior to the substance arriving on site. • Ensure there is a system for training all persons to access and understand Safety Data Sheets. • Ensure that an audit of compliance to this PHMP is conducted at least every 2 years. • Final approval of any new hazardous substances
Foreman and Supervisors	• Ensure that work being carried out is in line with the PHMP-HS • Conduct regular task observations on work involving hazardous substances work being carried out on site • Ensure there is a system for training all persons to access and understand the hazardous substances process • Correct SOPs for hazardous substances are followed • Relevant emergency procedures are known and followed • Conduct regular task observations on work involving hazardous substances processes • Authorise firi • Follow instruction on SDS for all hazardous substances. • Do not bring any unapproved substances onto site. • Do not use unapproved substances. • Obtain appropriate approval using the hazardous substances Approval for Use Form.ng to take place • Ensure all hazardous substances are used according to the requirements of the SDS and any particular SOPs that may exist for the work being undertaken.
Purchasing and Logistics Supervisor	• Ensure all people involved in procurement understand: • Correct procedures for accepting delivery of hazardous substances; • Relevant emergency procedures; • Not to accept unlabelled hazardous substances containers; and • Correct storage of hazardous substances delivered in approved storage areas upon delivery. • Ensure all hazardous substances supplied and/or stock managed by a vendor is approved for use at Macraes Operations.

Principal's Representatives	• Ensure all contractor personnel are adequately trained in the safe handling and use of hazardous substances in your area of accountability. • Ensure contractors maintain a register of hazardous substances that is available on demand. • Ensure contractors have SDS's available on demand.
HS&T Department	• Make arrangements to retain various documents relating to management and control of substances, as a record, in a suitable form for the periods specified in legislation. • Ensure all hazardous substances used in your department are able to be handled safely at all times. • Ensure there is a training Plan to achieve competency in handling hazardous substances. • Ensure an SDS is available for all hazardous substances used on site, or if appropriate the risk assessment. • Approve the use of hazardous substances for site. • Ensure areas are available to correctly store all hazardous substances in approved storage areas. • Keep the Macraes Operations approved hazardous substances list current. • Maintain the ChemAlert system. • Initiate and manage the approval process for introducing new and or sample hazardous substances onto site. • Review and approve / reject hazardous substances to be used by contractors. • Obtain Environmental department approval for hazardous substances classified as hazardous. • Ensure Hazchem management requirements are in place and effective at Macraes Operations.

9 TRAINING, CONSULTATIONS & COMMUNICATIONS

All Macraes Operations personnel shall receive required site-specific skill and knowledge during mandatory induction training, refresher training, and ongoing job safety training as per the Macraes Operation Training Palm developed in line with Health and Safety in Employment (Mining Operations and Quarrying Operations) Regulations 2013. Additional training will be conducted whenever significant changes are made to the PHMP-HS.

All mine workers affected by the requirements of the PHMP-HS shall have an understanding of their roles and responsibilities.

Competencies for management positions will be quoted in the management structure as specified in the Health and Safety in Employment (Mining Operations and Quarrying Operations) Regulations 2013 and as deemed necessary by the SSE to meet the requirements of the PHMP-HS.

Trainee	Training Requirement
All mine workers (includes contractors)	• All mine workers shall receive required site-specific skill and knowledge during mandatory induction training • Familiarised with PHMP-HS • Trained on the principles and processes in this procedure with a theory assessment • All mine workers affected by the requirements of this plan shall have an understanding of the plan and their roles and responsibilities
Approved handlers	• All of the above • Approved handlers training including transport, handling and storage of hazardous substances. • Reading and interpretation of material safety data sheet contents • PPE • Hazard/Risk control • Waste disposal • Emergency arrangements and response • Disposal of hazardous substances • Accounting of hazardous substances
Supervisors	• All of the above

9.1 Consultation

The SSE must consult with mine workers and the Macraes health and safety representatives about the content of the health and safety management system when:

- preparing the health and safety management system; and
- reviewing the health and safety management system, or any part of it.

9.2 Communications

The SSE will ensure the existence of the PHMP-HS, and an overview of the content of is communicated to all mine workers, including contractors, who are required to undertake work in operational areas.

The processes shall ensure that mine workers are provided with an understanding of hazardous substances management processes, related issues/incidents and any relevant changes in procedures prior to implementation. The communication process is shown in Figure 3.

10 CORRECTIVE ACTIONS

Non-conformances will be identified by incident, hazard reports and task observations, or by reviews and audits. All non-compliances identified will be investigated and corrective action will be taken to deal with any reported non-conformance of any aspect of the PHMP-HS.

11 MONITOR AND REVIEW

The management review process shall address compliance and requirement changes to the elements of the PHMP-HS. Apart from requirements under legislation, reviews shall be scheduled in the following circumstances:

- following any event or findings that identify an inadequacy in the PHMP to effectively manage identified hazards;
- the ORR is to be review on a six monthly basis. This include all principal hazards and there controls;
- a three-year review shall be conducted to determine that there are no changes to the variables being managed in the PHMP and that the system and procedures detailed in the PHMP are effective controls;
- all reviews of the plan or associated documentation shall give consideration to all operations of the mine. The monitoring and review program shall be in accordance with the Macraes Operations health and safety management system and be designed for either verification or auditing; and
- the adequacy of the maintenance and inspection programmes identified in the CCCS is ensured by the document owner and the SSE conjointly reviewing the CCCS on completion.

11.1 Audits

The purpose of audits are to confirm that the provisions of PHMP-HS are implemented and operating in practice and to provide feedback on PHMP-HS performance as input into the three yearly review process.

11.1.1 Internal Audits

The process of the internal audit programme provides an evaluation of the effectiveness of policies, procedures, and controls in relation to the PHMP-HS. The CCCS constitutes the internal auditing process. The frequency of the audits will be determined by the Macraes Senior Management Team through giving consideration to the importance of the activity, past audit results and the significance of problems encountered in the area to be audited.

Unscheduled inspections may be conducted at any time based upon:

- external audit results;
- accident/incident reports;
- document change requests; and
- a management review.

11.1.2 External Audits

The process of the external audit provides opportunities to review and evaluate the management systems in place from an objective viewpoint. External audits provide an audit opinion based upon inspection and analysis.

External audits will be conducted as a minimum every three years utilising either external auditors or specialists, and will consider the PHMP-HS and its related procedures, guidelines, and systems.

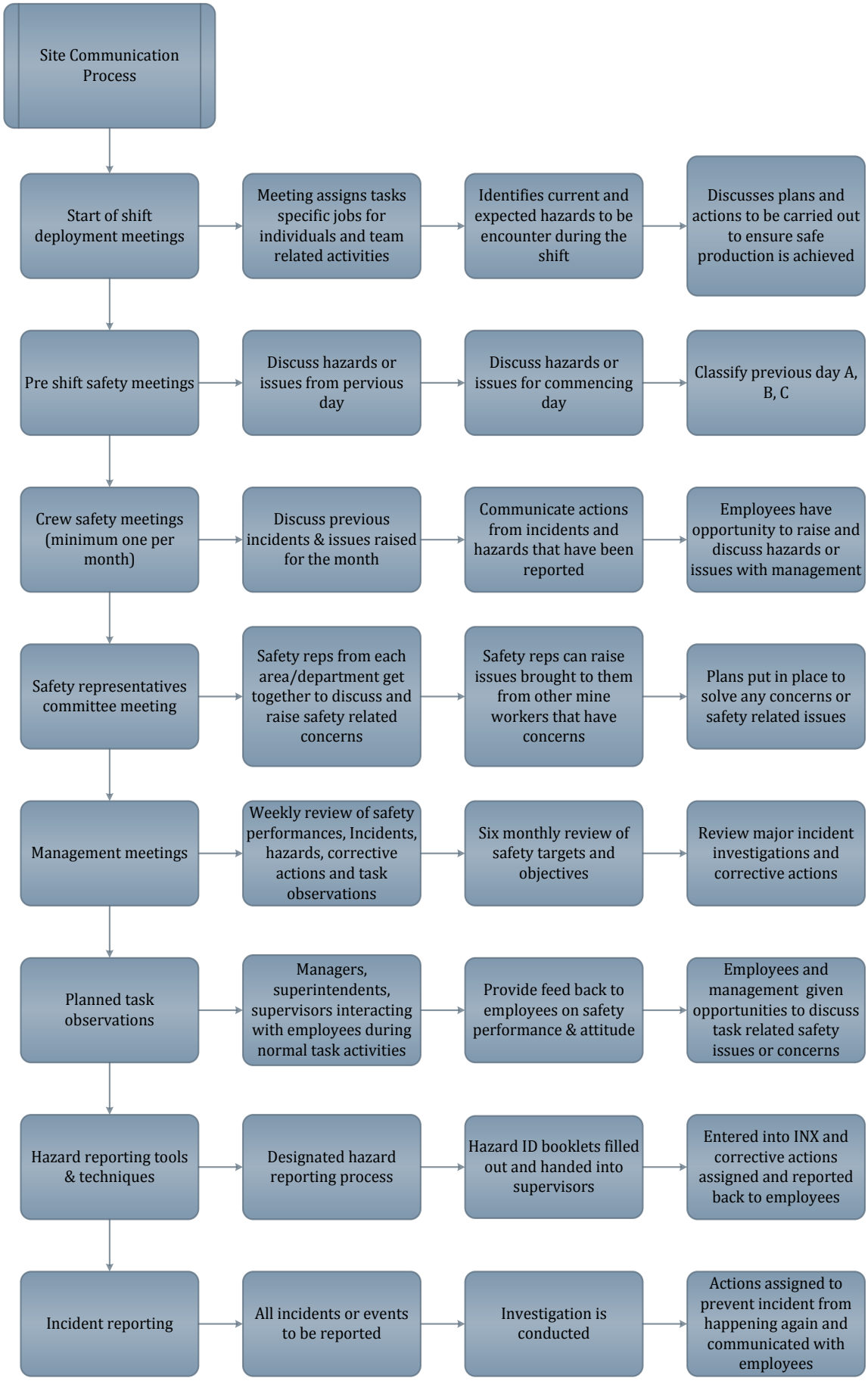


Figure 3: Macraes Operation Communication Process

12 DEFINITIONS

Term	Meaning
Additional Site Controls	Site controls are controls at department level that have been implemented to reduce the risk of the principal hazard. These include SOPs, procedures, management plans, inspections etc.
ALARP	As Low as Reasonably Practicable
Approved 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.
CCCS	Critical Control Check Sheet
Change Management	The process used to assess and assimilate all internally and externally driven changes in a routine but methodical fashion.
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.
Competent Person	For any task means a person who has acquired through training, qualification or experience, or a combination of them, the knowledge, and skills to carry out that task.
Continuous Improvement	The process of enhancing a process, system, or item, to achieve improvements in overall safety, performance, reliability, serviceability, efficiency, cost, or other parameter in line with OceanaGold's management philosophies.
Critical Controls	A critical control is a control that will have the greatest impact on preventing the risk(s) relating to the principal hazard from occurring, or if the risk was to occur the critical control would provide the greatest mitigation of the potential consequences.
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.
EMCP	Emergency Management Control Plan
EPA	Environmental Protection Authority
External Audit	An audit in which the lead auditor, at the least, has no constant operational ties to the mine
Formalised Controls	Formalised controls are controls that have been formalised across the site and are a part of the overall safety management system for the mine.
ORR	Operational Risk Register is a broad brush risk assessment of all existing principal and major hazards and mitigating controls at the Macraes Operation
Hazard	That which has the potential to cause harm or damage
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 • Corrosiveness • Toxicity (including chronic toxicity) • 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).
Internal Audit	An audit conducted by the mine personnel
Label	A set of information on a container which: identifies the substance in the container; identifies whether the substance is hazardous; and provides basic information about the safe use and handling of the substance.
Maintenance Equipment	Includes: cable reels, Cat IT machines, Franna crane, contractor cranes, and 15 tonne forklift
Management of Change	The process used to assess and assimilate all internally and externally driven changes in a routine but methodical fashion
Manager	The mine operator of a mining operation must appoint a person to: (a) manage the mining operation; and (b) supervise the health and safety aspects of the mining operation every day on which any mine worker is at work
Mine Worker	A person who works in a mining operation, either as an employee or as a self-employed person or contractor
OceanaGold	Oceana Gold (New Zealand) Limited
Person in Charge	The person who is in control of the place where hazardous substances are present e.g. Department Manager.
PHMP-HS	Principal Hazard Management Plan – hazardous substances
Principal Hazard	Any hazard that may have the potential to cause multiple fatalities
RA **(Risk Assessment)**	A Risk Assessment is the process of determining the likelihood and consequence of a specific negative event (or risk).
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 may have a positive or negative impact.
Risk	The risk of injury or illness to a person or damage to equipment arising out of a hazard.
Risk Management	The culture, processes and structures that are directed towards realising potential opportunities whilst managing adverse effects
Risk Phrase	These are the risk definitions used in the ChemAlert system

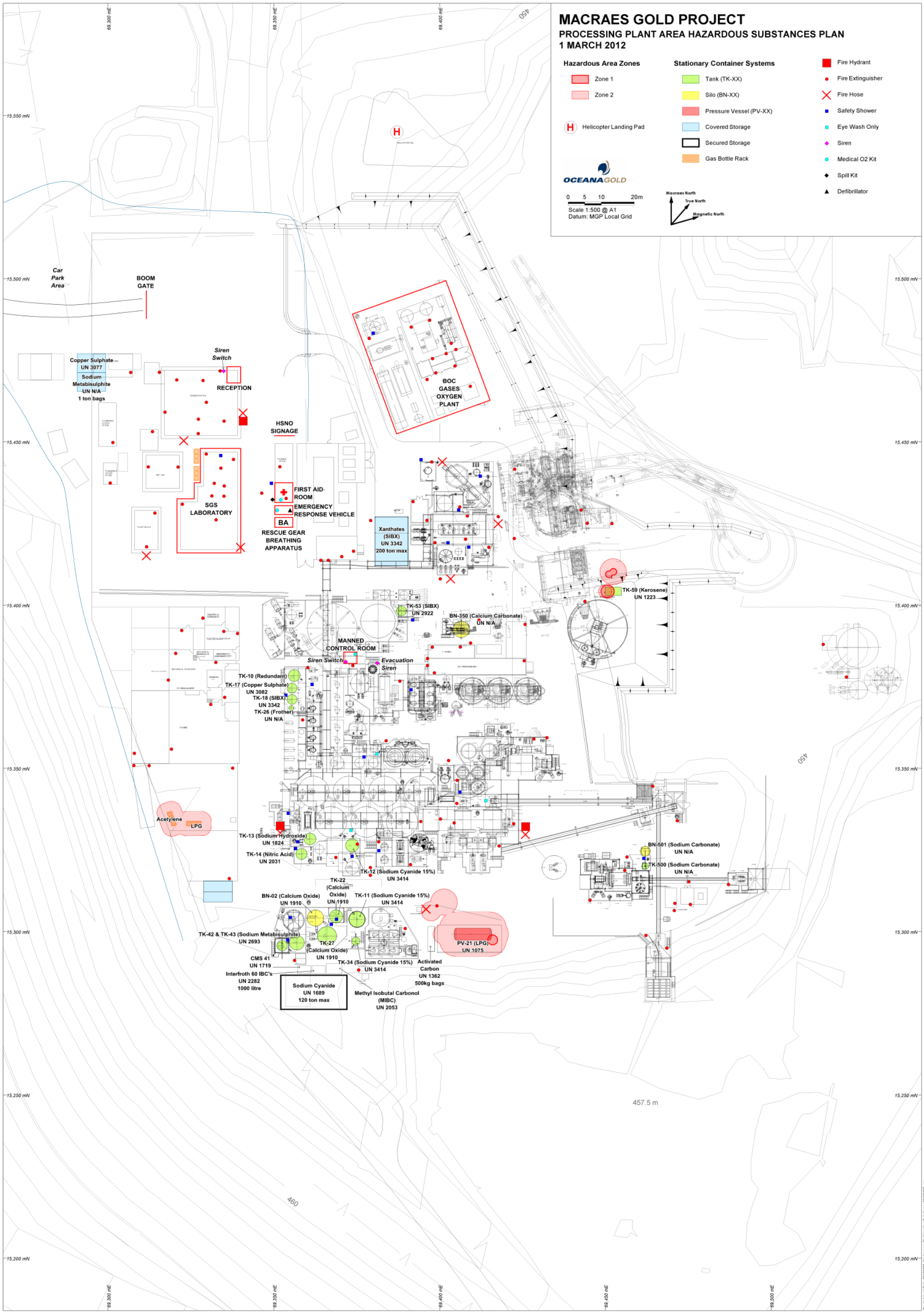
Safety Phrase	These are the safety definitions used in the ChemAlert system
SDS **(Safety Data Sheet)**	A document providing information to help users develop correct occupational hygiene and safety procedures and exercise the required degree of care. An SDS: a) identifies the substance and its use; 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
SSE	Site Senior Executive
Substance	a) Any element, defined mixture of elements, compounds, or defined mixture of compounds, either naturally occurring or produced synthetically, or any mixtures thereof; b) Any isotope, allotrope, isomer, congener, radical, or ion of an element or compound which has been declared by the Authority, by notice in the Gazette, to be a different substance from that element or compound; c) Any mixtures or combinations of any of the above; d) Any manufactured article containing, incorporating, or including any hazardous substance with explosive properties.
TARP	Trigger Action Response Plan
WES	Workplace Exposure Standards

13 REFERENCES

Listed below, is information that is directly related to the development of this document or referenced from within this document.

- Health and Safety at Work (In Mining Operations and Quarrying Operations) Regulations 2016
- Health and Safety at Work Act 2015
- Guidance for a Hazard Management System for Mines – June 2013
- Macraes Mine 2014 (Operational Risk Register)
- Principal hazard Management Plan Fire and Explosion
- Principal Hazard Management Plan - Explosives
- Oceanagold 2014 (Health/Safety/Environment Compliance Standards Manual)
- Safe Work Australia hazardous substances code of Practice
- AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines
- Risk Assessments-hazardous substances-2014
- Hazardous Substance and New Organism Act 1996
- Hazardous Substances (classes 1 to 5 Controls) Regulations 2001
- Hazardous Substances (Identification) Regulations 2001
- Hazardous Substances (Disposal) Regulations 2001
- Hazardous Substances (emergency management) Regulations
- Hazardous Substances (Tracking) Regulations 2001
- AS 2187.1 – 1998 – hazardous substances –Storage, Transport and Use -Part 1 – Storage

APPENDIX A – HAZARDOUS SUBSTANCES LAYOUT AT PROCESSING PLANT



APPENDIX B – CCCS

CCCS			
NAME		**DATE**	
PRINCIPAL HAZARD	Hazardous Substances	**FREQUENCY**	Six Monthly (minimum)
Doc ID	***MAC-257-CHK-008***	**FINDINGS**	

CHECKLIST	**G**	**A**	**R**	***COMMENTS***
Inspection / Observations – Inspect all chemical storage locations within your department HSNO signage in place, as required (refer to HSNO guideline) SDS sheets in place, clear treatment plans identified within SDS Bunding adequate for spillage Areas are restricted or locked if required Separation distances between gas cylinders in storage locations (refer to HSNO Guidelines) Appropriate ventilation in chemical storage areas Fire extinguishers in place				
Training and Competencies – HSNO Approved handlers identified and in place Approved fillers if required (Oxygen bottles, air conditioning etc.) Operators are trained and competent to identify hazardous substances issues / damage / potential emergencies Trained and understand what to do if hazardous spill or incident / issues are identified Trained to use gas detection in areas required				
Management Plan – Chem alert utilised, up to date Hazardous substance approval used for new chemicals – workers / buyers understand requirements Adequate transport and handling across site Contractors are compliant with transporting hazardous chemicals Test certificates in place for storage areas (records available)				
Emergency Plan – Check that Emergency Management Control Plan is in place and is understood for a serious spill or exposure, review high risk areas Mock evacuations are undertaken in processing areas				
Appropriate support – Sufficient support to keep up to keep chem alert up to date.				
Documentation –				

Check documentation is - current test certificates, document stored in central locations, SDS sheets are up to date – good clear emergency actions on SDS				

Review HSEC alerts both internal and external relevant to this PHMP (MinEx, Worksafe, SharePoint etc.)	☐ yes ☐ no
Review internal incidents relevant to the Principal Hazard (INX report)	☐ Yes ☐ No
Look at ICAMs from the last 3-5 years involving this Principal Hazard. Are the controls still in place and effective?	☐ Yes ☐ No
Document which one/s and what actions were taken (safety department can assist in running reports) (attach reports if required)	
Incident 1:	
Incident 2:	
Incident 3:	
Incident 4:	
Incident 5:	
Incident 6:	

Improvement Actions	**Assigned to**	**Due Date**
1.		
2.		
3.		
4.		
5.		
6.		
7.		

Attach any other documentation used during this inspection – This check sheet must be entered into INX.

APPENDIX C - RISK PHRASES

R1	Explosive when dry
R2	Risk of explosion by shock, friction, fire or other sources of ignition
R3	Extreme risk of explosion by shock, friction, fire or other sources of ignition
R4	Forms very sensitive explosive metallic compounds
R5	Heating may cause an explosion
R6	Explosive with or without contact with air
R7	May cause fire
R8	Contact with combustible material may cause fire
R9	Explosive when mixed with combustible material
R10	Flammable
R11	Highly flammable
R12	Extremely flammable
R14	Reacts violently with water
R15	Contact with water liberates extremely flammable gases
R16	Explosive when mixed with oxidising substances
R17	Spontaneously flammable in air
R18	In use, may form flammable/explosive vapour-air mixture
R19	May form explosive peroxides
R20	Harmful by inhalation
R21	Harmful in contact with skin
R22	Harmful if swallowed
R23	Toxic by inhalation
R24	Toxic in contact with skin
R25	Toxic if swallowed
R26	Very toxic by inhalation
R27	Very toxic in contact with skin
R28	Very toxic if swallowed
R29	Contact with water liberates toxic gas
R30	Can become highly flammable in use
R31	Contact with acids liberates toxic gas
R32	Contact with acids liberates very toxic gas
R33	Danger of cumulative effects
R34	Causes burns
R35	Causes severe burns
R36	Irritating to eyes
R37	Irritating to respiratory system
R38	Irritating to skin
R39	Danger of very serious irreversible effects
R40	Limited evidence of a carcinogenic effect
R41	Risk of serious damage to eyes
R42	May cause sensitisation by inhalation
R43	May cause sensitisation by skin contact
R44	Risk of explosion if heated under confinement

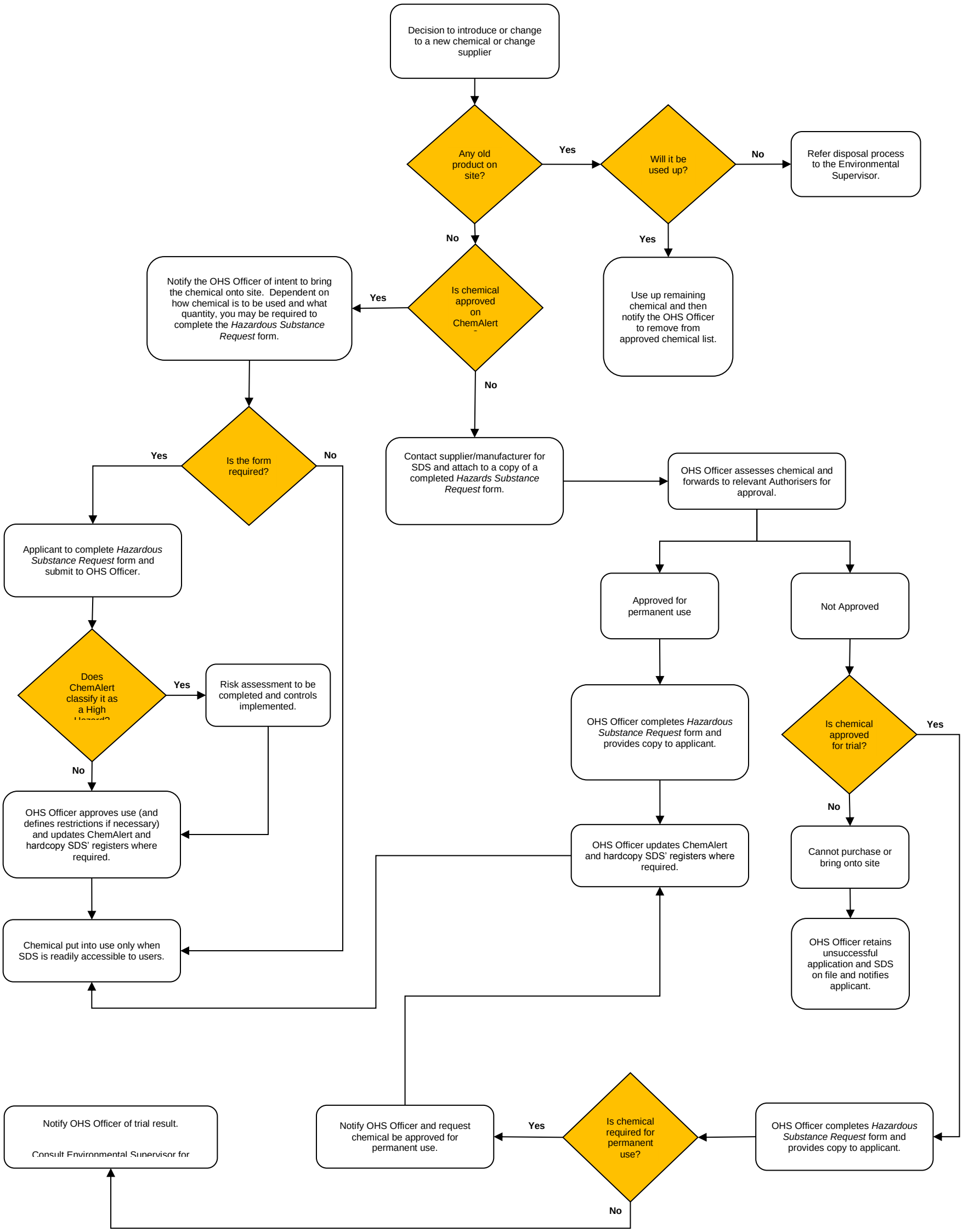
R45	May cause cancer
R46	May cause heritable genetic damage
R48	Danger of serious damage to health by prolonged exposure
R49	May cause cancer by inhalation
R50	Very toxic to aquatic organisms
R51	Toxic to aquatic organisms
R52	Harmful to aquatic organisms
R53	May cause long-term adverse effects in the aquatic environment
R54	Toxic to flora
R55	Toxic to fauna
R56	Toxic to soil organisms
R57	Toxic to bees
R58	May cause long-term adverse effects in the environment
R59	Dangerous for the ozone layer
R60	May impair fertility
R61	May cause harm to the unborn child
R62	Possible risk of impaired fertility
R63	Possible risk of harm to the unborn child
R64	May cause harm to breast-fed babies
R65	Harmful may cause lung damage if swallowed
R66	Repeated exposure may cause skin dryness or cracking
R67	Vapours may cause drowsiness and dizziness
R68	Possible risk of irreversible effects

APPENDIX D - SAFETY PHRASES

S1	Keep locked up
S2	Keep out of the reach of children
S3	Keep in a cool place
S4	Keep away from living quarters
S5	Keep contents under... (appropriate liquid to be specified by the manufacturer)
S6	Keep under... (inert gas to be specified by the manufacturer)
S7	Keep container tightly closed
S8	Keep container dry
S9	Keep container in a well-ventilated place
S10	Keep contents wet
S11	Avoid contact with air
S12	Do not keep the container sealed
S13	Keep away from food, drink and animal foodstuffs
S14	Keep away from... (incompatible materials to be indicated by the manufacturer)
S15	Keep away from heat
S16	Keep away from sources of ignition - No smoking
S17	Keep away from combustible material
S18	Handle and open container with care
S20	When using do not eat or drink
S21	When using do not smoke
S22	Do not breathe dust
S23	Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer)
S24	Avoid contact with skin
S25	Avoid contact with eyes
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S27	Take off immediately all contaminated clothing
S28	After contact with skin, wash immediately with plenty of... (to be specified by the manufacturer)
S29	Do not empty into drains
S30	Never add water to this product
S33	Take precautionary measures against static discharges
S35	This material and its container must be disposed of in a safe way
S36	Wear suitable protective clothing
S37	Wear suitable gloves
S38	In case of insufficient ventilation wear suitable respiratory equipment
S39	Wear eye/face protection
S40	To clean the floor and all objects contaminated by this material use... (to be specified by the manufacturer)
S41	In case of fire and/or explosion do not breathe fumes
S42	During fumigation/spraying wear suitable respiratory equipment (appropriate wording to be specified by the manufacturer)
S43	In case of fire use... (indicate in the space the precise type of fire-fighting equipment. If water increases the risk add - Never use water)
S45	In case of accident or if you feel unwell seek medical advice immediately (show the label where possible)
S46	If swallowed, seek medical advice immediately and show this container or label

S47	Keep at temperature not exceeding... °C (to be specified by the manufacturer)
S48	Keep wet with... (appropriate material to be specified by the manufacturer)
S49	Keep only in the original container
S50	Do not mix with... (to be specified by the manufacturer)
S51	Use only in well-ventilated areas
S52	Not recommended for interior use on large surface areas
S53	Avoid exposure - obtain special instructions before use
S56	Dispose of this material and its container at hazardous or special waste collection point
S57	Use appropriate containment to avoid environmental contamination
S59	Refer to manufacturer/supplier for information on recovery/recycling
S60	This material and its container must be disposed of as hazardous waste
S61	Avoid release to the environment. Refer to special instructions/safety data sheet
S62	If swallowed, do not induce vomiting, seek medical advice immediately and show this container or label
S63	In case of accident by inhalation, remove casualty to fresh air and keep at rest
S64	If swallowed, rinse mouth with water (only if the person is conscious)

APPENDIX E – PROCESS FOR A NEW CHANGE OF HAZARDOUS SUBSTANCE



APPENDIX F - INFORMED CONSENT FORM

OCEANAGOLD
INNOVATION, PERFORMANCE & GROWTH

Health Surveillance and Biological Monitoring
Consent and Authorisation
Privacy Act 1993

I consent to the carrying out of health surveillance and/or biological monitoring testing and retesting (as/if required).

I understand that other personal health information that will be gathered by the tester is necessary to ensure any test results are accurate.

I authorise the release of my test results to the management of OceanaGold (NZ) Limited and any health professional employed by the Company when they request the same. I understand this will assist the Company to fulfil its responsibilities under the Health and Safety in Employment Act 1992 and will assist in the identification of hazards associated with Company activities at the Macraes Gold Project.

I understand that the results will be kept secure and that I am entitled to have access to the results as provided in the Privacy Act 1993.

I consent to and authorise the management of OceanaGold (NZ) Limited and any other health professional employed by the Company to obtain and see the results of any earlier tests I have had for the gathering of statistical information.

Company .....

Full Name .....

Signed .....Date .....

APPENDIX G - HAZARD CLASSIFICATION QUANTITY BEYOND WHICH CONTROLS APPLY

Threshold guidelines

The Hazardous Substance and New Organism (HSNO) Act 1996 regulates hazardous substances based on the risks they pose to people and the environment. The hazardous properties of a substance are classified to determine how the risks of a substance can be safely managed. The HSNO Act places rules on a substance to manage the risks posed to people and the environment. These rules are known as controls and vary depending on the amount of hazardous substances you hold and the hazard classifications of these substances. Certain controls only apply in you have hazardous substances above certain quantities.

This document provides guidance on the quantities of hazardous substances that trigger the following key HSNO controls:

- Approved handlers
- Location test certificates
- Fire extinguishers
- Signage, and
- Emergency response plans and secondary containment.

Approved handlers

An approved handler is someone who is qualified to handle very hazardous substances. If you have quantities of hazardous substances that exceed the amounts below, you will need an approved handler test certificate.

Hazard classification	Quantity beyond which controls apply
2.1.1A	100 kg non-permanent gases or 100 m³ permanent gases
2.1.2A	3,000 L aggregate water capacity
3.1A	Any amount
3.1B	250 L when in containers > 5 L or 500 L when in containers ≤ 5 L
3.2A	Any amount

Hazard classification	Quantity beyond which controls apply
3.2B	100 L
4.1.1A	100 kg
4.1.2A, 4.1.2B	Any amount
4.1.2C, 4.1.2D	25 kg
4.1.2E, 4.1.2F	50 kg
4.1.3A	Any amount
4.1.3B	100 kg
4.2A	Any amount
4.2B	100 kg
4.3A	Any amount
4.3B	100 kg
5.1.1A	Any amount
5.1.1B	500 kg or 500 L
5.1.1C	1 000 kg
5.1.2A	250 kg or 200 m³
5.2A, 5.2B	Any amount
5.2C, 5.2D, 5.2E, 5.2F	10 kg or 10 L
6.1A, 6.1B, 6.1C	Any quantity
6.7A	≥10 kg or ≥10 L
8.2A	Any quantity
9.1A, 9.2A, 9.3A, 9.4A	Any quantity
Propellant powders of classes 1.1C (UN 0160) and 1.3C (UN 0161)	≥ 50 kg before sale to the public or ≥ 15 kg after sale to the public

Location test certificates

A location test certificate is needed at hazardous substance locations where explosive, flammable or oxidising substances are stored or used and the quantity exceeds the threshold set out in legislation. If you store quantities of these substances that exceed the amounts below, you will need a location test certificate.

Hazard classification	Quantity beyond which controls apply for closed containers	Quantity beyond which controls apply when use occurring in open containers
2.1.1A , 2.1.1B	100 kg or 100 m³ permanent gas	100 kg or 100 m³ permanent gas
2.1.2A	3,000 L (aggregate water capacity)	3,000 L (aggregate water capacity)
3.1A	20 L	20 L
3.1B	100 L in containers > 5 L or 250 L in containers ≤ 5 L	50 L
3.1C	500 L in containers > 5 L or 1,500 L in containers ≤ 5 L	250 L
3.2A, 3.2B, 3.2C	1 L	1 L

Hazard classification	Quantity beyond which controls apply
4.1.1A	1 kg
4.1.1B	100 kg
4.1.2A, 4.1.2B	1 kg
4.1.2C, 4.1.2D	25 kg
4.1.2E, 4.1.2F, 4.1.2G	50 kg
4.1.3A, 4.1.3B, 4.1.3C	1 kg
4.2A	1 kg
4.2B, 4.2C	25 kg
4.3A	1 kg
4.3B	25 kg
4.3C	50 kg
5.1.1A	50 kg or 50 L
5.1.1B	500 kg or 500 L
5.1.1C	1,000 kg
5.1.2A	100 kg non-permanent gas or 200 m³ permanent gas
5.2A, 5.2B	> 10 kg
5.2C, 5.2D	> 25 kg
5.2E, 5.2F	> 100 kg

Note: Explosives (Class 1) are excluded from these tables.

Emergency management

If you store hazardous substances at your site you need to put measures in place so that if an incident or emergency occurs, the effects are minimised or controlled. The quantity and hazard classifications of the substances you hold will dictate the level of emergency management you require.

Fire extinguishers

If you hold flammable or oxidising substances above the quantities specified below you will require fire extinguishers at your site. In some cases you will need two fire extinguishers.

Hazard classification	Quantity beyond which fire extinguishers are required	Number
2.1.1A	50 kg non-permanent gas or 30 m³ permanent gas	1
2.1.1B	200 kg non-permanent gas or 120 m³ permanent gas	2
2.1.2A	3,000 L aggregate water capacity	1
3.1A	50 L	1
	200 L	2
3.1B	250 L	2
3.1C, 3.1D	500 L	2
3.2A, 3.2B, 3.2C	50 L	1
	200 L	2
4.1.1A	250 kg	2
4.1.1B	500 kg	2
4.1.2A, 4.1.2B, 4.1.2C, 4.1.2D, 4.1.2E, 4.1.2F, 4.1.2G	50 kg or 50 L	1
	200 kg or 200 L	2
4.1.3A, 4.1.3B, 4.1.3C	50 kg or 50 L	1
	200 kg or 200 L	2
4.2A	50 kg or 50 L	1
	200 kg or 200 L	2
4.2B	250 kg	2
4.2C	500 kg	2
4.3A	50 kg or 50 L	1
	200 kg or 200 L	2
4.3B	250 kg or 250 L	2
4.3C	500 kg or 500 L	2
5.1.1A	5 kg or 5 L	1
5.1.1B	200 kg or 200 L	1
5.1.1C	500 kg	2
5.1.2A	10 kg non-permanent gas or 10 m³ permanent gas	1
	50 kg non-permanent gas or 50 m³ permanent gas	2
5.2A, 5.2B	1 kg or 1 L	1
5.2C, 5.2D	10 kg or 10 L	1
5.2E, 5.2F	50 kg or 50 L	1

Note: Explosives (Class 1) are excluded from this table.

Signage

If you hold quantities of hazardous substances in excess of the amounts below you will require signage.

Signs notify employees, emergency services and other people of the presence of hazardous substances at your site. Signs should describe the hazards posed by the substances present.

Hazard classification	Quantity beyond which signage is required
2.1.1A	250 kg non-permanent gas or 100 m³ permanent gas
2.1.1B	500 kg non-permanent gas or 200 m³ permanent gas
2.1.2A	3,000 L aggregate water capacity
3.1A	50 L
3.1B	250 L
3.1C	1,000 L
3.1D	10,000 L
3.2A	50 kg or 50 L
3.2B	250 kg or 250 L
3.2C	1,000 kg or 1,000 L
4.1.1A	250 kg
4.1.1B	1,000 kg
4.1.2A, 4.1.2B	50 kg or 50 L
4.1.2C, 4.1.2D	250 kg or 250 L
4.1.2E, 4.1.2F, 4.1.2G	1,000 kg or 1,000 L
4.1.3A	50 kg or 50 L
4.1.3B	250 kg or 250 L
4.1.3C	1,000 kg or 1,000 L
4.2A	50 kg or 50 L
4.2B	250 kg or 250 L
4.2C	1,000 kg or 1,000 L
4.3A	50 kg or 50 L
4.3B	250 kg or 250 L
4.3C	1,000 kg or 1,000 L
5.1.1A	50 kg or 50 L
5.1.1B	500 kg or 500 L
5.1.1C	1,000 kg
5.1.2A	250 kg non-permanent gas or 500 m³ permanent gas
5.2A, 5.2B	1 kg or 1 L
5.2C, 5.2D, 5.2E, 5.2F	10 kg or 10 L
6.1A	5 kg non-permanent gas or 2.5 m³ permanent gas
	50 kg or 50 L
6.1B	5 kg non-permanent gas or 2.5 m³ permanent gas
	250 kg or 250 L
6.1C	5 kg non-permanent gas or 2.5 m³ permanent gas
	1,000 kg or 1,000 L
6.1D	10,000 kg or 10,000 L
8.1A	1,000 kg or 1,000 L
8.2A	5 kg non-permanent gas or 2.5 m³ permanent gas
	50 kg or 50 L
8.2B	50 kg non-permanent gas or 25 m³ permanent gas
	250 kg or 250 L
8.2C	1,000 kg or 1,000 L
8.3A	1,000 kg or 1,000 L
9.1A,	100 kg or 100 L
9.1B, 9.1C	1,000 kg or 1,000 L
9.1D	10,000 kg or 10,000 L
9.2A	100 kg or 100 L
9.2B, 9.2C	1,000 kg or 1,000 L
9.2D	10,000 kg or 10,000 L
9.3A	100 kg or 100 L
9.3B	1,000 kg or 1,000 L
9.3C	10,000 kg or 10,000 L
9.4A	100 kg or 100 L
9.4B, 9.4C	1,000 kg or 1,000 L

Note: Explosives (Class 1) are excluded from these tables.

APPENDIX H – HAZARDOUS SUBSTANCE APPROVAL FOR USE FORM

Hazardous Substance Approval for Use - MAC-255-FOR-008

DETAILS

Date Requested:	**Date Substance Required:**
Requested By:	
Name:	Phone:
Position:	Fax:
Department:	Email:
Submitted To:	
Name:	Phone:
Position:	Fax:
Department:	Email:
Comments:	

PRODUCT INFORMATION

Product Name:

Maximum Qty to be Stored:

Container Size and Type: (e.g. 20L Plastic Pail)

Store Stock Code:

Product Location: (e.g. Plant Met Lab)

Storage Location: (e.g. Frother Cupboard)

HSNO Requirements:

Location Test Certificate?	Yes ☐	No ☐	Spill Kit Required?	Yes ☐	No ☐
Tracking?	Yes ☐	No ☐	Safety Shower/Eyewash Required?	Yes ☐	No ☐
Approved Handler?	Yes ☐	No ☐	Signage Supplied?	Yes ☐	No ☐
PPE Available?	Yes ☐	No ☐	Fire Suppression Required?	Yes ☐	No ☐

Any potential incompatibility issues with other substances?	Yes ☐	No ☐
If Yes, what?		
Is the Substance classified as a High Hazard in ChemAlert?	Yes ☐	No ☐
If 'yes' complete risk assessment and attach and implement controls. If 'no' move onto next page.		
Has a Risk Assessment been completed and attached?	Yes ☐	No ☐
Have the Risk Controls been implemented?	Yes ☐	No ☐

MANUFACTURERS INFORMATION

Manufacturers SDS supplied? Yes ☐ No ☐

Manufacturer:

Address:

Phone: **Fax:**

Email: **Emergency Phone:**

Website:

Comments:

PRODUCT USE

Intended Use:

Nature of Use: Continuous ☐ Once Off ☐ On Trial ☐ Other ☐

If Other, specify:

Duration of Use:

Is this a Replacement Product? Yes ☐ No ☐

Product to be Replaced:

Reason for Replacement:

Does this require an MOC? Yes ☐ No ☐

Does this require an EMA? Yes ☐ No ☐

Comments:

APPENDIX I – RISK ASSESSMENT ON HAZARDOUS SUBSTANCES

Hazard Details				Contributing Factors	Risk Category	CWC Consequence	Current Controls			Current Risk Analysis			Recommaddtional Risk Treatments	Target Risk Analysis			RIMS ACTION No
Primary Source	General Situation	Specific Source	Specific Situation				Preventative	Monitoring	Contingency	C	L	R		C	L	R	
LPG (Bulk Transport Tank)																	
	Uncontrolled release resulting in Fire					4											
		Transport vehicle	Vehicular Collision				Equipment certification, Trained transport personnel, appropiate signage			3	E	6					
			Collision with fixed plant				10km/h speed limit, Defined accessway, inducted drivers		Open low traffic area	3	E	6					
			Equipment Failure				Certified provider, review of systems and safety in the tendering process			3	E	6					
			Earthquake resulting in transport vehicle impact causing damage							3	E	6					
		At or around the storage tank					No ignition source zone, Equipment certification, regular tests checks,		Deluge System	2	E	3					
LPG (Bulk Site Tank)																	
	Uncontrolled release resulting in Fire					4											
			Vehicular Collision				Vehicular Guarding, 10km/h speed limit			3	E	6					
			Equipment Failure				Annual certifications, work performed by competent Gas fitters			3	E	6					
			Earthquake resulting in damage				Nothing in zone that could possible fall on it			3	E	6					
			Unauthorised access and damage				Controlled site access, Vessel not in public view or easy access			3	D	9					

			Inappropiate maintenance				Safety flags on automated maintenance system			3	D	9						
			Maintenance performed without appropiate isolation				PTW system, Training for all pesonnel, work planned			3	D	9						
		Distribution system		Not clearly identified			Visual inspections of lines above ground		Low pressure - 20psi	2	D	5	leak test annually	2	E	3		
			Vechicular collision	No vehicle protection at some points			low speed, controlled vehicle access, location of pipes not protected			2	D	5						
			Equipment failure	No legal requirement of testing						2	D	5						
			Inappropiate maintenance performed (work on incorrectly identified line)							2	D	5						
			Maintenance performed without appropiate isolation							2	D	5						
		HE-03	Equipment failure				Safety shutoff	Regular maintennce	Low pressure supply	3	D	9						
		HE-01	Equipment failure				Safety shutoff	Regular maintennce	Low pressure supply	3	D	9						
		Goldroom Furnace 1	Equipment failure				Safety shutoff, good ventilation, Non-smoking area, controlled workspace			2	D	5						
		Goldroom Furnace 2	Equipment failure							2	D	5						
		HE-350	Equipment failure				Safety shutoff, restricted work area, SOP's, prestart checks,	External auditing, internal ispections, regular maintenance		3	E	6						
		Analytical Lab Fire Assay	Equipment failure				Limited work place, good ventilation, PPE worn for dealing with heat and fire			2	E	3						

		Metallurgical Lab	Gas heater equipment failure				Regular maintenance checks, making sure fit for service		Large space	2	E	3					
		KN-03	Equipment failure				Regular maintenance replacing damaged or U/S parts	Routine, planned maintenance		2	E	3					
		KN-01	Equipment failure				Regular maintenance replacing damaged or U/S parts	Routine, planned maintenance		2	e	3					
		KN-02	Equipment failure				Regular maintenance, replacing damaged or U/S parts	Routine, planned maintenance		2	E	3					
	Uncontrolled release resulting in engulfment					4											
		Metallurgical Lab	Gas Heater Flame Fail				Regular inspections, safety mech shutting of gas flow			2	D	5	Prestart check				
			Pipe rupture				Located where unable to be damaged leading to leak, as much as possible hard plumbed										
		Goldroom	Flame fail on Furnace 1				Safety shutoffs			3	D	9					
			Flame fail on Furnace 2				Safety shutoffs										
			Pipe rupture				Hard plumbed and low pressure, visually inspectable										
		Analytical Lab Fire Assay	Flame fail on Fire Assay Furnace 1							2	D	5					
			Flame fail on Fire Assay Furnace 2														
			Flame fail on Cupalation furnace														
			Pipe rupture														

		HE-01 building	Flame fail on burner							2	D	5					
			Pipe rupture														
		HE-03 building	Flame fail on burner							2	D	5					
			Pipe rupture														
		HE-350 building	Pipe rupture							2	E	3					
			Flame fail on burner														
Sodium Cyanide																	
	Fire in pelletised NaCN storage compound					5	No ignition sources, controlled area			4	E	10					
	Spillage of NaCN pelletised material resulting in human contact					4				3	E	6					
		Transport truck accident on route to site from Dunedin							high standard of packaging	3	E	6					
		Whilst unloading with forklift from transport truck					high standard of packaging, competent forklift operators, trained in hazardous substances		scenerio discussed and tested if leakage did occur	2	D	5					
		Whilst transferring from Transport truck to Storage compound					10km/h travel speed, unloaded as close to storage as practical			1	D	2					
		Whilst transferring from Storage compound to Mixing station					Appropiate PPE worn for mixing			1	D	2					
		In the process of mixing pellets to become a solution					Full Chemical suite of PPE, minimal manual handling, SOP	HCN meter worn		2	C	8					

	Spillage of 14% NaCN Solution resulting in human contact					4				3	D	9					
		From Mixing tank					PPE protocol, Clear identification of tank storing cyanide solution, regular maintenance program		Bunded, away from normal work areas, die added for allow identification of cyanide solution	2	E	3					
		From Distribution holding tank					Minimal human interaction, instrumentation for level indication		Bunded, away from normal work areas, die added to allow identification of cyanide solution	2	E	3					
		From Distribution system					permenant stainless Steel			3	D	9	Peventative Maintenance task to Leak Test annually	3	E	6	
			Due to inappropiate isolation before maintenance work performed	Not clearly identified lines													
			Due failure of pipeline														
			Due to failure of flange, valves, pumps and other equipment other than actual pipeline														
			Due to collision with mobile equipment				Located where no acces of vehicles			2	E	3					
	Hydrogen Cyanide Generation resulting in human exposure					4				3	d	9					
		Leach Tank	Low ph due to pH control system failure				pH 24hr monitoring and auto control with safety back ups, controlled areas with higher potential	use of personal HCN monitors, work requiring Gas testing		3	d	9					

			Low ph due to lime dosage and caustic dosage failure															
			Entering confined space without CSP															
		Water used on a fire containing NaCN pellets					Stored in a controlled area where not othe tasks or work can occur, open air environment			2	e	3						
		Pellet dissolution process	clearing of material not falling out of bag				appropiate ppe, SOP, training,			2	e	3						
			Removal of rubbish/bag material from trash basket in top of mix tank															
Sodium Isobutyl Xanthate (SIBX)																		
	Fire in SIBX bulk box storage shed			Self conbustible if moist		5	No other flamibles stored in area, Well protected from weather, sealed containers			2	e	3						
	Dry product spillage resulting in human contact					3				2	d	5						
		Transport truck accident on route to site from Dunedin																
		Whilst unloading with forklift from transport truck																
		Whilst transferring from Transport truck to Storage compound																
		Whilst transferring from Storage compound to Mixing station																
		In the process of mixing dry product into a solution																

	Spillage of SIBX Solution resulting in human contact					3				1	c	4						
		Mixing tank								1	e	1						
			Doing a mix	Regular task			SOP, PPE special, Active alarms aleting other people in the area											
		Distribution holding tank					Regular maintenance, clearly signed			1	e	1						
		Distribution system		Not easily identifiable			Whole system recently risked assessed and modified			2	c	8	clearly mark lines	2	D	5		
			Inappropiate isolation before maintenance work performed				PTW system, Isolation procedure			2	d	5						
			Pipeline failure				Stainless piping, welded			2	e	3						
			Flange failure				minimal flanges			2	d	5						
			Collision (mobile equipment)				Not in areas accessible by mobile equipment			2	e	3						
			Overflowing header tanks				Whole system recently risked assessed and modified			2	d	5						
			Dislodged dosing lines				Specific system for measuring			2	d	5						
			Whilst measuring dosage rates				Specific system for measuring			2	d	5						
			Whilst Cleaning and flushing filters				system upgrade, SOP, PPE			2	c	8						

			Clearing a blockage				system upgrade, SOP, PPE			2	c	8					
	Carbon disulfide Generation resulting in human exposure					4				2	d	5					
		Storage Shed								2	e	3					
			Fire														
		Mixing Tank								1	c	4					
			Remove of bagging/trash from confined space														
			Inappropiate use of PPE														
			Entry to area without PPE														
Nitric Acid																	
	Spillage resulting in human contact					4				3	d	9					
		Transport Truck															
			Accident on route from Dunedin to Site				Engineering of tanks,		HASNO signs on vehicle for Emerg Services	3	d	9					
		Transport truck transferring to Storage tank					SOP, system engineering	Training, standards and equipment on vehicle		3	e	6					

			Coupling not fitted correctly														
			Damaged transfer pipes														
			Not following correct procedure														
		Storage Tank															
			Overfilling				engineered to control spill, two level sensors,			2	d	5					
			Maintenance performed without appropiate isolation				Clear identification of hazard, education of hazard			3	e	6					
		Distribution system		*no testing and not clearly definable as HNO3 line*			Warning system identifying HNO3 inject occurring			3	c	13	Clear identification of line	3	C	6	
			Due to inappropiate isolation before maintenance work performed				PTW system, and protocol			3	c	13	Clear identification of line, regular pressure testing of line	3	C	6	
			Due failure of pipeline				short line, away from regular work spaces	Flow indicator that trips if no flow identified		3	c	13	Clear identification of line, regular pressure testing of line	3	C	6	
			Due to failure of flange, valves, pumps and other equipment other than actual pipeline				Detailed HAZOP completed when HNO3 introduced			3	c	13	Clear identification of line, regular pressure testing of line	3	C	6	
			Due to collision with mobile equipment				Well protected frm mobile equipment			3	e	6					

	Generation of NOx gases resulting in human exposure					5											
			Due to overfilling Storage tank							4	e	10					
			Due to pipeline failure							4	d	14	Regular Pressure testing protocol and clear idendification of distributio n lines	4	E	10	
			Due to failure of flange, valves, pumps and other equipment other than actual pipeline							4	d	14	Regular Pressure testing protocol and clear idendification of distributio n lines	4	E	10	
			Due to inappropiate discharge from Elution Vessels							3	e	6					
Sodium Hydroxide (NaOH)																	
	Spillage resulting in human contact					4											
		Transport Truck								3	e	6					

			Accident on route from Dunedin to Site				tank engineering, truck driver training		HAZNO signs								
		Transport truck transferring to Storage tank					System engineering, SOP, PPE			3	e	6					
			Coupling not fitted correctly														
			Damaged transfer pipes														
			Not following correct procedure														
		Storage Tank															
			Overfilling				Tank engineering, two level sensors - local monitoring by person filling			3	e	6					
			Maintenance performed without appropiate isolation				Clearly identified tank and hazards			3	e	6					
		Distribution system					Clearly identified lines			3	d	9					
			Inappropiate isolation before maintenance work performed							3	d	9					
			Failure of pipeline							3	d	9					
			Failure of flange, valves, pumps and other equipment other than actual pipeline							3	d	9					
			Mobile equipment collision				Well protected			3	e	6					

	Generation of Caustic fumes resulting in human exposure					4											
		Storage Tank															
			Overfilling leaving product in bund				Bunded, two level sensors for filling process, SOP			3	e	6					
			Additon of water				closed tank, clearly identified			4	e	10					
		Pipeline failure					Surrounded in lagging			3	c	13	Annual Leak testing	3	e	6	
		Failure of flange, valves, pumps and other equipment other than actual pipeline					Short run, away from general access			3	c	13	Annual Leak testing	3	e	6	
	Uncontrolled Exothermic Reaction resulting in human exposure					4											
		Storage tank					design of tank limits this ability, employee training			4	e	10					
			Inavertant addition of water to storage tank				SOP's										
Copper Sulphate ($CuSO_4$)						4											

	Fire in bulk storage shed					4				4	e	10					
	Dry product spillage resulting in human contact					3				2	c	8					
		Transport truck accident on route to site from Dunedin								1	c	4					
		Whilst unloading with forklift from transport truck								1	c	4					
		Whilst transferring from Transport truck to Storage compound								1	c	4					
		Whilst transferring from Storage compound to Mixing station								1	c	4					
		In the process of mixing dry product into a solution								2	c	8					
	Spillage of $CuSO_4$ Solution resulting in human contact					3				2	c	8					
		Mixing tank		non-flowing material			Appropiate PPE, SOP, minimised manual input			2	c	8					
		Distribution holding tank								2	e	3					
		Distribution system															
			Inappropiate isolation before maintenance work performed							2	c	8					

			Pipeline failure				Upgrade to stainless permenant line			2	e	3					
			Flange failure				Very few welded line			2	e	3					
			Collision (mobile equipment)				well protected, 10km/h speed			2	e	3					
			Dislodged dosing lines				hard plumbed			2	e	3					
			Whilst measuring dosage rates				PPE, designed measureing points			2	c	8					
			Whilst Cleaning and flushing filters				SOP, PPE,			2	c	8					
			Clearing a blockage				PPE, upgrade system			2	c	8					
	Dust Generation from Spillage resulting in human inhalation					3				3	d	9					
		Transport truck accident on route to site from Dunedin															
		Whilst unloading with forklift from transport truck					Any spill Cleaned up immediately, practised scenario			1	c	4					
		Whilst transferring from Transport truck to Storage compound								1	c	4					
		Whilst transferring from Storage compound to Mixing station								1	c	4					
		In the process of mixing dry product into a solution															

			Inappropiate use of PPE when mixing				SOP, Observations, training			2	d	5					
			Entry to area without PPE				Signage, Training			2	d	5					
Sodium Dibutyl Dithiophosphate (CMS 41)																	
	Spillage resulting in human contact			*Permenant damage to eyes*		4				4	e	10					
		Transport Truck															
			Accident on route from Dunedin to Site														
		Whilst unloading with forklift from transport truck															
		Whilst transferring from Transport truck to Storage area															
		Whilst transferring from Storage compound to distribution station															
		Whilst filling storage tank from transport vessels															
		Storage Tank								4	d	14	Use of chemical goggles as minimum PPE for eye protection	4	e	10	
			Overfilling														

			Maintenance performed without appropiate isolation															
		Distribution system								4	d	14	use of chemical goggles as minimum PPE for eye protection , Annual Pressure testing	3	e	6		
			Inappropiate isolation before maintenance work performed							4	d	14	use of chemical goggles as minimum PPE for eye protection	3	e	6		
			Failure of pipeline							4	d	14	use of chemical goggles as minimum PPE for eye protection	3	e	6		
			Failure of flange, valves, pumps and other equipment other than actual pipeline							4	d	14	use of chemical goggles as minimum PPE for eye protection	3	e	6		
			Mobile equipment collision							4	e	10						
	Generation of Hydrogen sulfide gas from a spillage resulting in human exposure					4												

		Transport Truck								4	e	10					
			Accident on route from Dunedin to Site														
		Whilst unloading with forklift from transport truck								3	e	6					
		Whilst transferring from Transport truck to Storage area								3	e	6					
		Whilst transferring from Storage compound to distribution station								3	e	6					
		Whilst filling storage tank from transport vessels								3	d	9					
		Storage Tank															
			Overfilling leaving product in bund							3	d	9					
		Pipeline failure								3	d	9					
		Failure of flange, valves, pumps and other equipment other than actual pipeline								3	d	9					
	Evolution of Fumes from a spill resulting in human exposure					4											
		Transport Truck															

			Accident on route from Dunedin to Site							3	e	6					
		Whilst unloading with forklift from transport truck								3	e	6					
		Whilst transferring from Transport truck to Storage area								3	e	6					
		Whilst transferring from Storage compound to distribution station								3	e	6					
		Whilst filling storage tank from transport vessels								3	d	9					
		Storage Tank								3	d	9					
			Overfilling leaving product in bund														
		Pipeline failure								3	d	9					
		Failure of flange, valves, pumps and other equipment other than actual pipeline								3	d	9					
Kerosene																	
	Spillage resulting in human contact					3				3	e	6					
		Transport Truck								3	e	6					
			Accident on route from Dunedin to Site														

		Transport truck transferring to Storage tank								3	e	6					
			Coupling not fitted correctly														
			Damaged transfer pipes														
			Not following correct procedure														
		Storage Tank								3	e	6					
			Overfilling														
			Maintenance performed without appropiate isolation														
		Distribution system								3	e	6					
			Inappropiate isolation before maintenance work performed														
			Failure of pipeline														
			Failure of flange, valves, pumps and other equipment other than actual pipeline														
			Mobile equipment collision				bollards protecting			3	e	6					
	Spillage resulting in a Fire					4											

		Transport Truck								4	e	6				
			Accident on route from Dunedin to Site													
		Transport truck transferring to Storage tank					check systems on truck, static control systems (intrinsically safe equipment used)			3	e	6				
			Damaged or malfunction of transfer equipment													
			Not following correct procedure													
		Storage Tank					double skinned, identified as an no smoking area		not in a major through fare away from other famables	3	e	6				
			Maintenance performed without appropiate isolation													
		Distribution system					Installation standards,			3	d	9				
			Inappropiate isolation before maintenance work performed													
			Mobile equipment collision													
Metallurgical Laboratory						3										
	Fire						Haz Substances Stored away from fire sources		very small volumes of Haz Sub <2L, evac practices	3	e	6				
Analytical Laboratory						3				3	d	9				
	Fire						Appropiate storage of Haz Sub	Fire alarms	Evac procedures and practices							

Appendix 2 – Letter from Prue Harwood, Response to O'Connell submission on the Coronation North Project

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Oceana Gold (New Zealand) Ltd
PO Box 84
Palmerston 9443
New Zealand

20 September 2016

Attention: Debbie Clarke

Dear Debbie

Response to O'Connell Submission on the Coronation North Project

Introduction

As requested in your email of 7 September 2016, I have reviewed the submission made by Mathew and Kate O'Connell to the Waitaki District Council regarding the Coronation North Project. The submission made by the O'Connells notes that they are currently experiencing a significant amount of dust (and noise), from the existing Coronation Project and they are concerned that an extension to the project will result in more dust and noise. The submission notes that the prevailing winds are from the northwest which blows straight towards their property and that their property is at a similar altitude to the Project.

Location of Project Areas and Meteorology

Figure 1 is an aerial photograph which shows the relative locations of the O'Connell property, the existing and proposed Coronation Project areas and other existing mine pits and tailings impoundments. Figure 1 is overlaid with a windrose which shows hourly average wind speed and directions measured at Golden Point Road (monitoring Site 3, refer Figure 2). Figure 1 illustrates that the O'Connell property is downwind of the existing and proposed Coronation project areas during northwesterly winds and also other significant features of the Oceana mining project, including a tailings impoundment.

The O'Connells property is located approximately 5.6 km from the southerly extent of the existing Coronation Project and will be approximately 7.2 km from the most southerly extent of the proposed Coronation North Project.

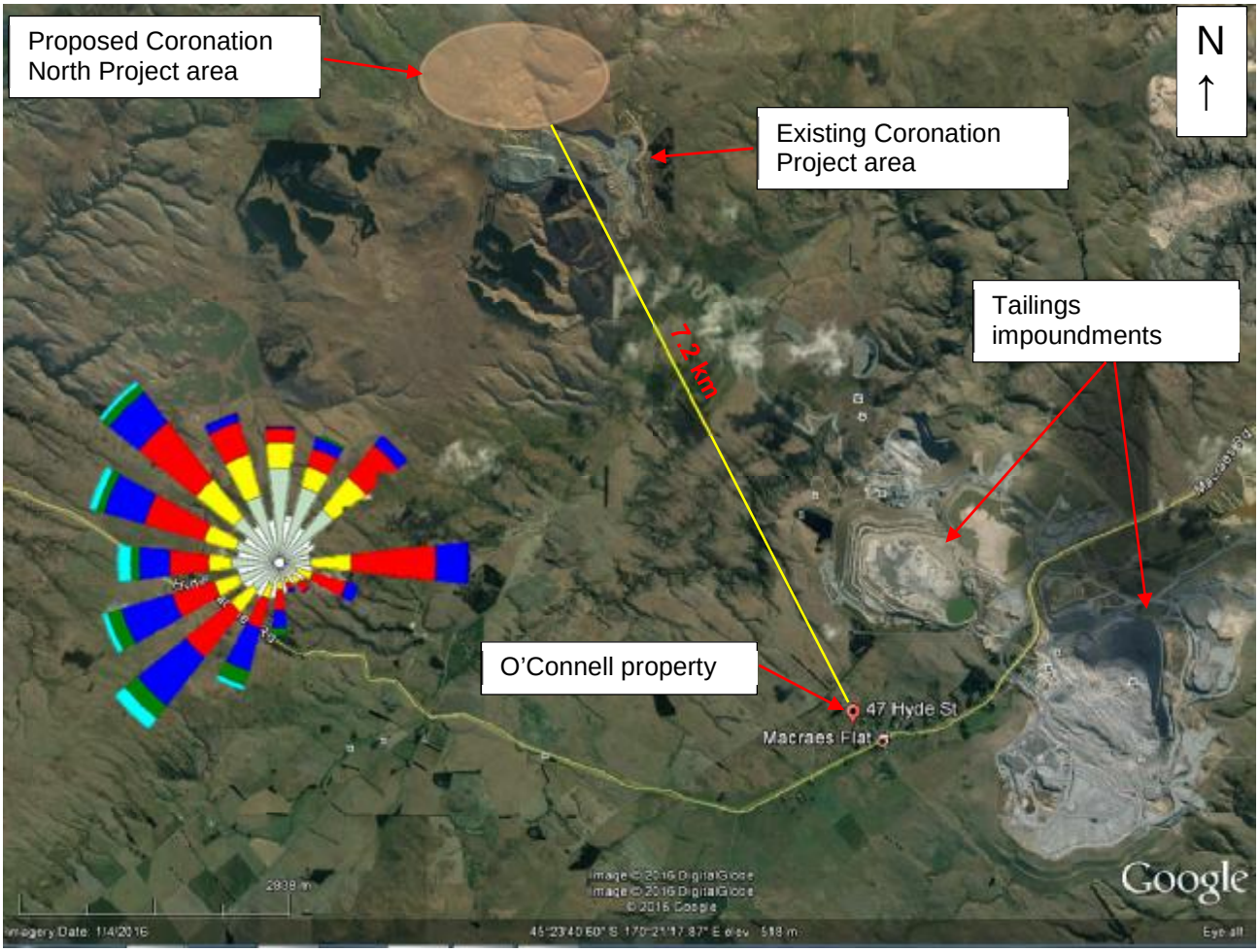


Figure 1 Aerial photograph showing the location of the O'Connell property, the existing Coronation Project area, the proposed Coronation North Project area, tailings impoundment and a wind rose of hourly average winds measured at Golden Point Road between 2012 and 2015

Dust Monitoring

The dust monitoring carried out by OceanaGold is described in full in the Beca report entitled "*Oceana Gold (New Zealand) Limited – Coronation North – Assessment of Effects of Discharges to Air"*[1] (Beca AEE report). In addition Beca carries out a review of all dust monitoring undertaken at Macraes each year on behalf of

[1] Beca Limited "*Oceana Gold (New Zealand) Limited – Coronation North – Assessment of Effects of Discharges to Air",* prepared for Oceana Gold, April 2016.

OceanaGold. The results of these reviews are reported in annual reports, which are presented to the Otago Regional Council.

OceanaGold monitors deposited dust at a total of 13 sites, two of which are located in close proximity to the O'Connell property (Sites 2 and 15). OceanaGold also monitors total suspended dust (TSP) at Site 15.

Figure 2 shows the location of O'Connell property and the locations of Sites 2 and 15, which are the closest monitoring sites to the O'Connell property, and also Site 3 where the meteorological station is located.

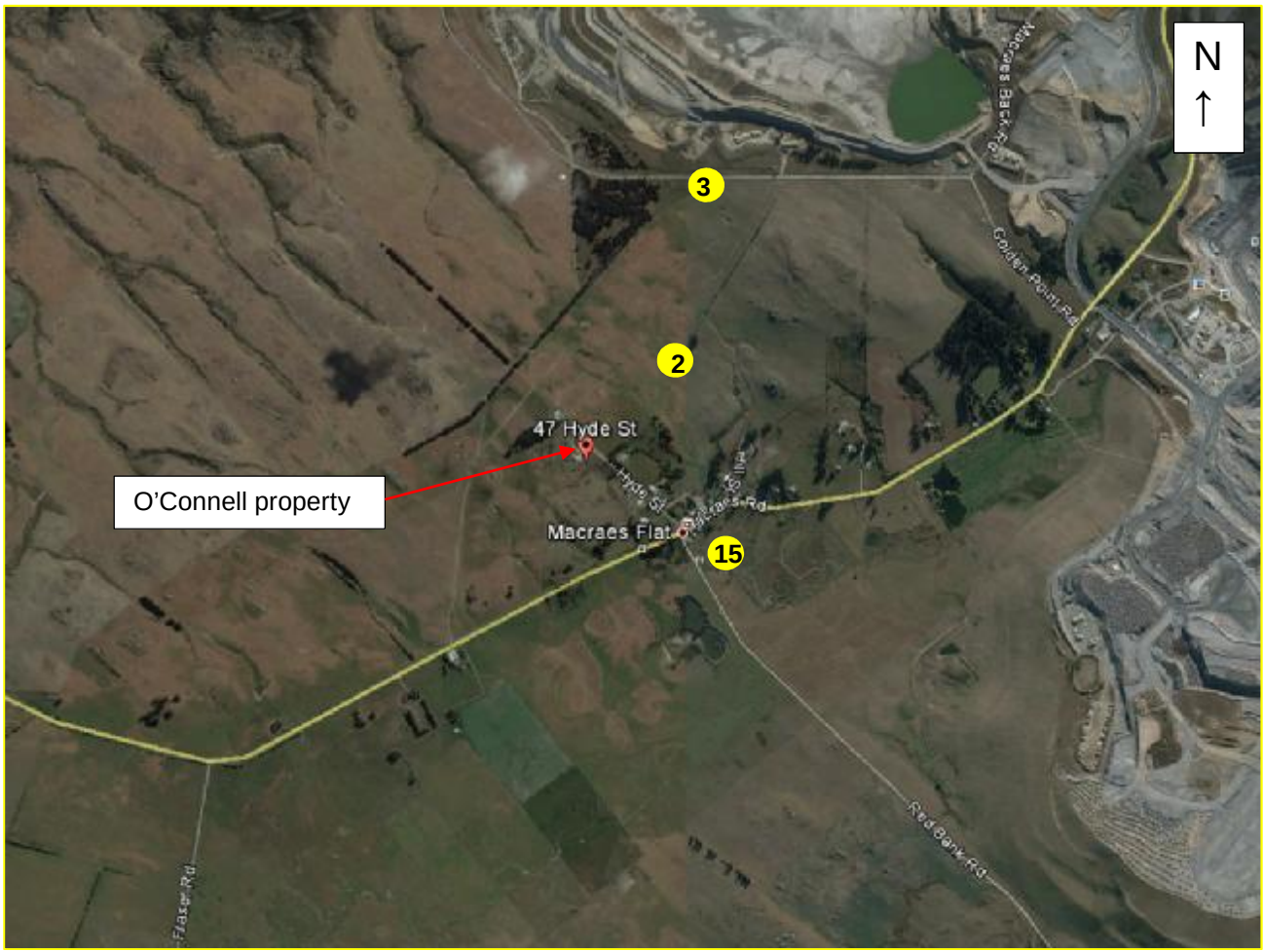


Figure 2 Aerial photograph showing the location of the O'Connell property and monitoring sites 2, 3 and 15.

The O'Connell property is approximately 430 m to the southwest of Site 2 and approximately 450 m to the northwest of Site 15. The dust levels recorded at Sites 2 and 15 are expected to provide a good representation of the dust levels at the O'Connell property, due to their proximity to the O'Connell property and their similar locations in relation to the Coronation Project and the other gold mining activities in the area.

The Beca AEE and annual monitoring reports for 2014 and 2015 include the results of the deposited dust and TSP monitoring that OceanaGold has carried out since mining began at the Coronation Project in 2014. The reports include the results for Sites 2 and 15 which are summarised in Table 1.

Table 1 - Summary of monitoring results for Sites 2 and 15

Result	2014[2]	2015[3]
Deposited Dust		
Average monthly insoluble deposited dust above background (g/m^2/30 days)	0.2	0.2
Maximum monthly insoluble deposited dust above background (g/m^2/30 days)	0.9	0.9
Consent limit	3 g/m^2/30 days (above background)	3 g/m^2/30 days (above background)
No of results above the consent limit of 3 g/m^2/30 days	0	0
Total Suspended Particulate		
Annual average TSP concentration (µg/m^3)	17.0	6.6
Median 24 hour average TSP concentration (µg/m^3)	4.1	0.9
Maximum 24 hour average TSP concentration (µg/m^3)	340.9	117.7
Consent limit (µg/m^3)	120	120
No of exceedances of consent limit of 120 µg/m^3	11	0

Table 1 demonstrates that deposited dust levels at Sites 2 and 15 have been consistently well below the consent limit since the mining operation began at the Coronation Project.

Table 1 also demonstrates that measured TSP concentrations exceeded the consent limit on 11 occasions in 2014. However, the Beca review of the 2014 monitoring results found that the majority of the exceedances of the TSP limit recorded in 2014 were attributed to the instrument recording moisture as particles during fog conditions and the remainder were likely due to sources of dust located in close proximity to the instrument.

[2] Beca "*Macraes Mine – Summary of Ambient Air Monitoring Results for 2014" May 2015*

[3] Beca "*Macraes Mine – Summary of Ambient Air Monitoring Results for 2015" April 2016*

The report concluded that all exceedances of the consent limit were unlikely to have been generated from the mine.[4]

It can be concluded from the monitoring results that the current mining operation, including the Coronation Project, has not resulted in any exceedances of the consent limits for deposited dust and TSP at Sites 2 and 15. Due to the proximity of Sites 2 and 15 to the O'Connell property, it is very likely that dust and TSP levels at the O'Connell property are also below the consent limits.

Potential Effects of Coronation North on the O'Connell Property

The Coronation North Project will extend the existing Coronation Project area to the north and further away from the O'Connell property than the current works. The scale of the mining operation will be the same as at present and the same mining and dust control methods will continue to be used. There will be no increase in the total rate of mining in the area.

The nature of dust and its effects are discussed in detail in Sections 5 and 7 of the Beca AEE report and the potential range, over which dust generated from the Coronation North Project, is discussed in Section 7.1.1 of the report. It was concluded in the report that properties within approximately 1 – 2 km of mining activities may be potentially affected by dust under worst case weather conditions, if appropriate dust mitigation measures are not implemented. This analysis took into consideration the scale of the operation, average wind speeds in the area, the nature of the terrain and altitude of the source.

The O'Connell property is located more than 5 km from Coronation North and is well beyond the distance at which dust is expected to carry and have the potential to cause adverse effects, including when the effects of elevated terrain and prevailing wind directions are taken into consideration. The results of monitoring carried out by OceanaGold demonstrate that current dust levels in the vicinity of the O'Connell property, due to the mining operations, have not resulted in any exceedances of the consent limits since the Coronation Project commenced. As no changes to the scale or nature of the mining operations are planned and the Coronation North mining activity will be further from the O'Connell property than the current mining activity, dust levels at the O'Connell property should not increase as a result of the Coronation North Project, providing OceanaGold carries out the dust mitigation measures required by the current and proposed consent conditions.

Although it is considered very unlikely for dust generated at the Coronation North Project to be deposited on the O'Connell property, dust from the mining activities may be visible in the distance. This may give the impression that dust from the visible source can impact on the observer's property. The resource consent conditions, which currently apply to the Coronation Project and which are proposed for Coronation North, require OceanaGold to control dust emissions so that visible dust beyond the boundary of the Macraes Gold Project site is not offensive or objectionable and to maintain dust levels below specified limits. This does not require OceanaGold to prevent all discharges of dust, but to minimise them using the methods of control outlined in the consent application and the dust management plan prepared for the site.

[4] Beca "*Macraes Mine – Summary of Ambient Air Monitoring Results for 2014" May 2015*

Conclusion

The results of monitoring carried out by OceanaGold in the vicinity of the O'Connell property indicate that dust levels are being adequately minimised and maintained within the limits of the current consent conditions. Providing OceanaGold continues to implement the mitigation methods currently utilised, it is expected that dust levels in the vicinity of the O'Connell property will not increase as a result of the Coronation North Project.

Yours sincerely

Prue Harwood
Senior Associate - Environmental Engineering

on behalf of

Beca Ltd

Direct Dial: +64 3 4773138
Email: prue.harwood@beca.com

Appendix 3 – Proposed Ecology Conditions for Consent

15 NATURE CONSERVATION AND LANDSCAPE VALUES

15.1 Within 6 months of exercising this consent the consent holder shall engage a suitably qualified and experienced ecologist to prepare and submit to the Councils a Coronation North Project Ecological Management Plan ("EMP"). The EMP may be combined with any EMP required by any other consent held by the consent holder for mining operations at Macraes Flat. The purpose of the EMP is to ensure compliance with conditions of this consent and otherwise to minimise the actual and potential adverse effects on the threatened species and general ecological values. The EMP shall be developed and prepared in consultation with the Department of Conservation and the consent holder shall provide a copy to the Department of Conservation, ORC and Councils. The EMP shall:

(a) Include sections covering vegetation and threatened plant management, avifauna, lizard management and aquatic management;

(b) Have the following objectives:

(i) To minimise the adverse effects from the implementation of the Coronation North Project on amenity/landscape; indigenous vegetation; threatened plants; resident lizard populations; indigenous avifauna and aquatic biota;

(ii) To protect indigenous flora, threatened plants and vegetation types; resident lizard populations, indigenous avifauna and aquatic fauna where practicable.

(c) Detail the methods by which the objectives set out in Condition 15.1(b) shall be achieved, including:

(i) Legal protection, fencing and management of Island Block and Highlay Hill areas as described in conditions 15.3-15.5;

(ii) propagation of fiftteen plant species as detailed in condition 15.6;

(iii) transplanting of the threatened plants identified in condition 15.7;

(iv) minimisation of construction effects including during construction of Coronation North Waste Rock Stack by keeping the area of disturbed land to a minimum; and

(v) monitoring.

(d) The consent holder shall implement the programme of activities specified in the EMP and in any subsequent EMP reports created pursuant to condition 15.2(c).

15.2 The consent holder shall engage a suitably experienced and qualified ecologist, to prepare an annual report:

(a) describing the works and other actions completed by the consent holder in the previous twelve months in order meet the purpose and objectives of the EMP; and

(b) evaluating the progress of the tussock species planting on rehabilitated land, transplanting of threatened plant species and the propagation and subsequent planting of the fifteen rare plant species listed in condition 15.6(a).

(c) Describing what methods are to be implemented in the following 12 months in order to meet the purpose and objectives of the EMP.

The consent holder shall provide the Councils, KTKO Ltd and Department of Conservation with a copy of the report by no later than 31 July each year. The report may be combined with any EMP report required by any other consent held by the consent holder for mining operations at Macraes Flat.

15.3 The consent holder shall set aside two areas of land comprising:

(a) Approximately 289 hectares known as Island Block as shown on the Plan annexed as Appendix X; and

(b) Approximately 83 hectares known as Highlay Hill as shown on the Plan annexed as Appendix Y.

15.4 The consent holder shall fence and manage the areas identified in condition 15.3 to protect existing and naturally regenerating indigenous terrestrial flora and fauna located within the respective land areas. This purpose shall be achieved by:

(a) Fencing both areas as shown on the Plans annexed as Appendices X and Y and removing all stock from both areas within 18 months of the exercise of this consent.

(b) Felling existing pine trees from the Island Block area within 18 months of exercise of this consent.

(c) Maintaining stock-proof fencing as shown on the Plan annexed as Appendix Y.

(d) Allowing natural ecological successional processes to occur on the land by undertaking no farming or mining activities.

15.5 The consent holder shall, within 18 months of the exercise of this consent, execute covenants in favour of the Minister of Conservation over the areas described at condition 15.3 pursuant to section 77 of the Reserves Act 1977, and register the covenants against the relevant land titles. The conservation purposes of the covenants shall be as described at condition 15.4 for protection of terrestrial and not aquatic values, and the obligations of the covenanter shall be limited to maintaining fencing and ensuring the covenanted land

is not used for farming or mining purposes. The survey and legal costs associated with creating the covenants in registrable form shall be borne by the consent holder.

15.6 The consent holder shall arrange for a suitably experienced person to:

(a) collect seeds, cuttings, plants or other cultivating material from the following species located within the impacted footprint of the Coronation North project:
Simplicia laxa;
Pachycladon cheesemanii;
Ranunculus ternatifolius;
Senecio dunedinensis;
Sonchus novae-zealandiae;
Carmichaelia corrugata;
Coprosma intertexta;
Deschampsia cespitosa;
Cardamine bilobata;
Largenophora barkeri;
Annogramma leptophylla;
Carex inopinata;
Aciphylla subflabellata;
Carex tenuiculmis; and
Carmichaelia crassicaulis ssp. crassicaulis.

(b) Cultivate twenty plants of each of the species identified in 15.6(a) to the stage they are ready to plant out; and

(c) assist in planting out the cultivated plants in suitable locations that have been identified by the consent holder in consultation with the Department of Conservation; and

(d) manage weed invasion of planting sites and monitor the success of all plantings annually for three years following planting.

15.7 Annually, as part of the consent holder's Project Overview and Annual Work and Rehabilitation Plan, the area of land to be disturbed in the following 12 months shall be assessed for the presence of the species identified in condition 15.6(a) above. Should individuals of the species be located the consent holder shall arrange for a suitably experienced person to salvage a maximum of 20 plants of each species and to assist in planting out and managing the salvaged plants in suitable locations that have been identified by the consent holder in consultation with the Department of Conservation. The management of plantings and annual monitoring of success shall be monitored annually for three years following planting.

15.8 Within 6 months of the exercise of this consent the consent holder shall make provision for the total sum of NZ$30,000 to be available for use by an appropriately qualified researcher, Masters or PhD student over 5 years to:

(a) participate in the lizard habitat creation required by condition 15.9 below and to conduct research to determine the success of that habitat; and

(b) conduct research into the effect of mining activities on lizard populations as outlined in condition 15.10 below.

15.9 (a) The consent holder shall construct ten lizard habitat areas (each one approximately 10m x 10m or equivalent area) consisting of vegetated, deep rock piles and boulders. This lizard habitat shall be within:

(i) areas in and around the margins of the Coronation North Waste Rock Stack identified by the researcher referred to in condition 15.8 or a suitably qualified herpetologist as suitable for lizard habitat creation;

(ii) areas surrounding the Coronation North Project Area identified by the researcher referred to in condition 15.8 or a suitably qualified herpetologist as suitable for lizard habitat creation.

(b) The consent holder shall consult with the researcher referred to in condition 15.8 or a suitably qualified herpetologist when placing and designing lizard habitat.

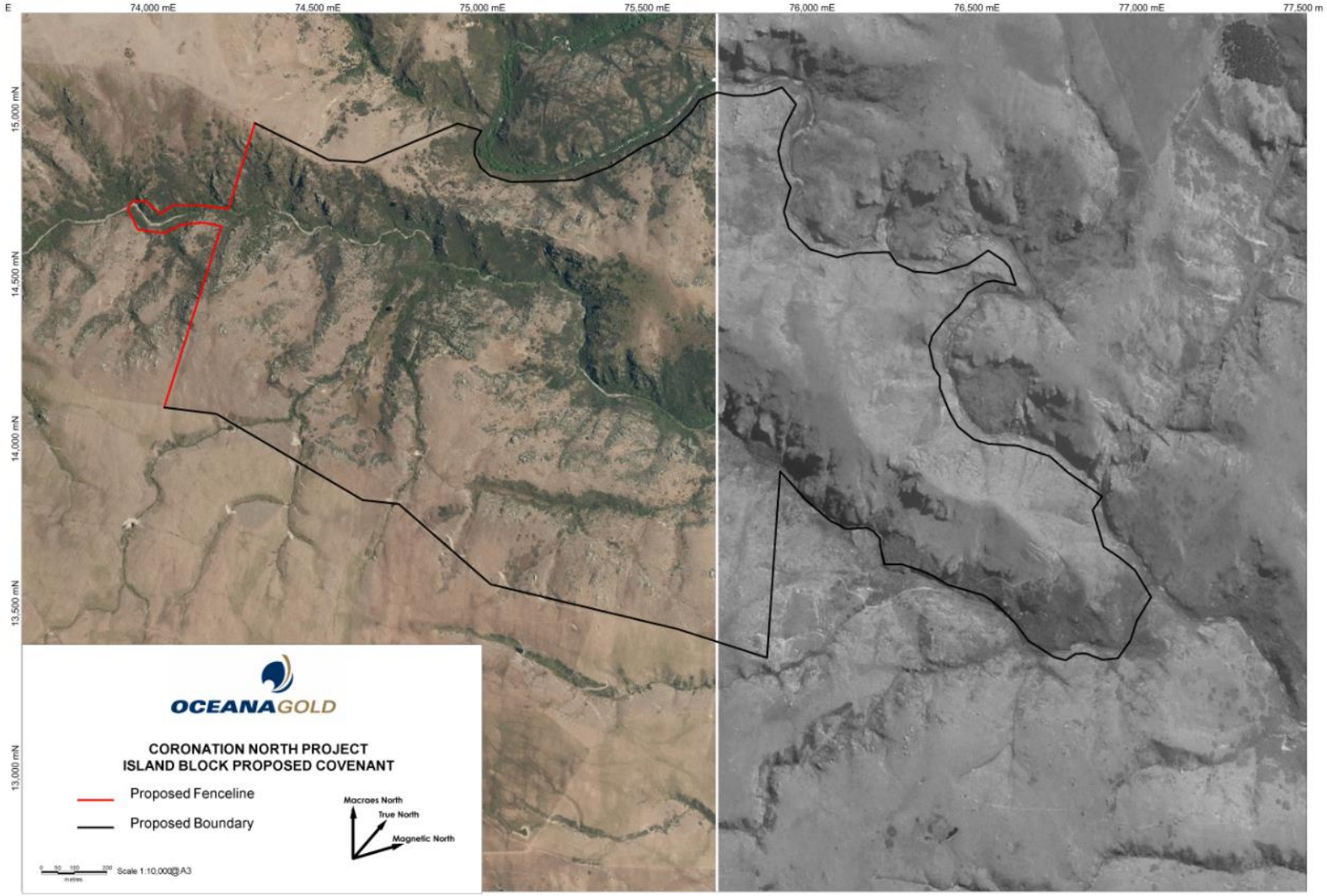
(c) As a minimum, the consent holder shall create habitat designed and constructed to provide suitable refuge for the range of lizard species found within the Coronation North project footprint.

(d) the consent holder shall plant fruit bearing shrubs and tussocks around the margins of rock piles to benefit lizards where it is recommended by the researcher referred to in condition 15.8 or a suitably qualified herpetologist.

(e) The consent holder shall arrange for the researcher referred to in condition 15.8 or a suitably qualified herpetologist to monitor lizard colonisation of new rock piles on an annual basis for five years from the creation of the piles, using best practice techniques to detect changes in abundance over time. Records shall be kept of all monitoring and those records shall be provided to the Consent Authority upon request.

15.10 The consent holder shall assist the researcher referred to in condition 15.8 to undertake research that has the objective of identifying the benefit of the conservation and preservation of the lizard species affected by the Coronation North project. This study may include survey of the footprint of the Coronation North waste rock stack before construction, survey of the Coronation North waste rock stack during construction and survey of a suitable control site to compare population numbers and diversity.

APPENDIX X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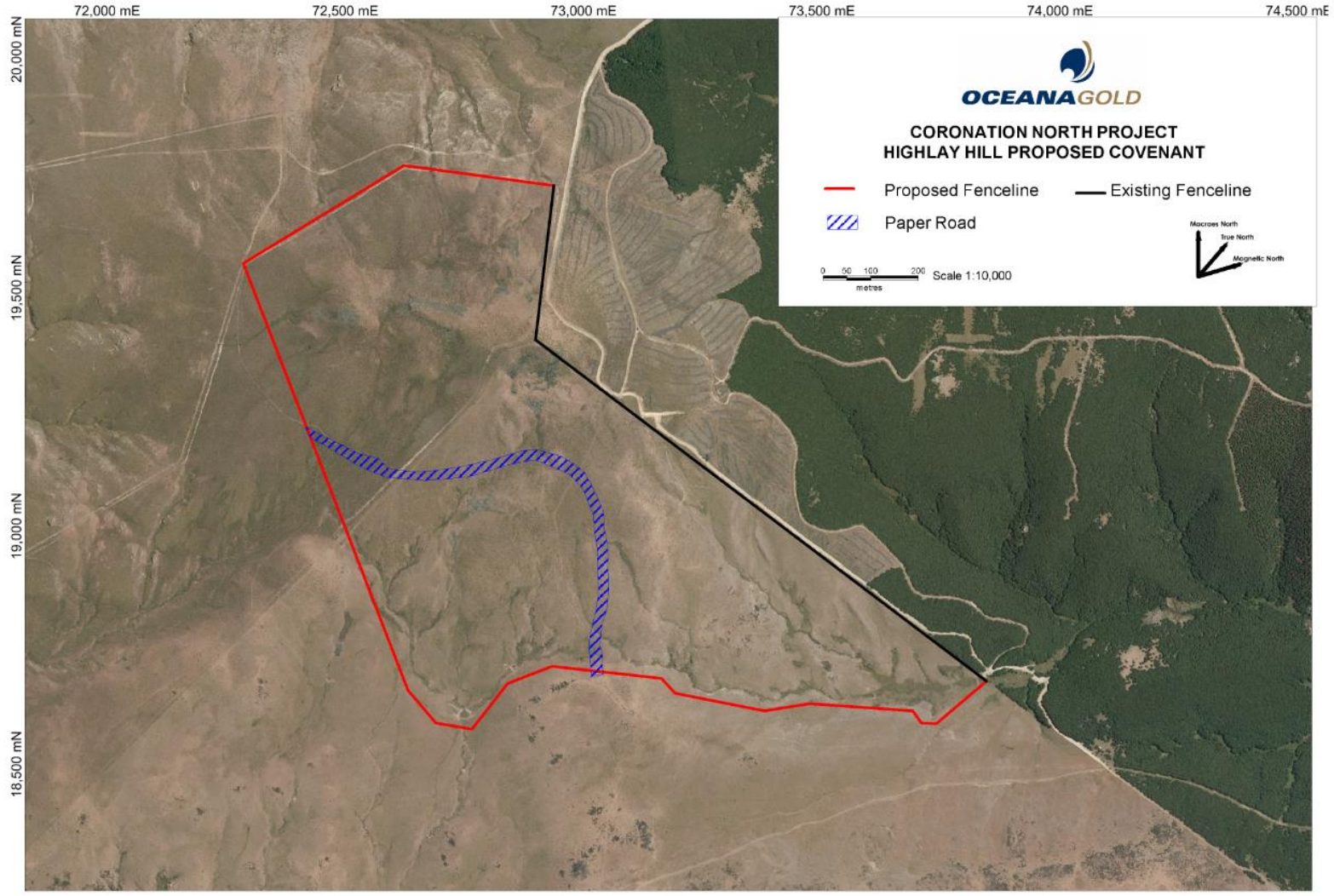
13,000 mN
OCEANAGOLD
CORONATION NORTH PROJECT
ISLAND BLOCK PROPOSED COVENANT
Proposed Fenceline
Proposed Boundary
Macraes North
True North
Magnetic North
Scale 1:10,000@A3

APPENDIX Y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19,000 mN
18,500 mN
OCEANAGOLD
CORONATION NORTH PROJECT
HIGHLAY HILL PROPOSED COVENANT
Proposed Fenceline
Existing Fenceline
Paper Road
Macraes North
True North
Magnetic North
0 50 100 200
metres
Scale 1:10,000