

# Review of the advice to the Chief Executive of WSNZ from the Chief Inspector Extractives WSNZ concerning the PRRA application for Exemption from compliance with Regulation 170 (4) (a) of the Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016

Arising from the re-entry activities of the Pike River Recovery Agency

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## CONTENTS

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Executive Summary	3
Scope	5
Intended Outcome	6
Context	7
Method	8
Review Outcomes	9
Key Considerations	9
Legislation	9
PRRA Exemption Application	10
WSNZ Exemption Recommendations	12
Extent of the exemption	12
Exemption consistency with purpose of Act	13
What is or is not reasonably practicable	14
WSNZ procedure to consider exemption application	15
Description of the phenolic plug	17
Appendix A Reference Documents	18
Appendix B Legislative Excerpts	19
Appendix C Authorised Codes of Practice	24
Appendix D Previous Reference Documents	25

## EXECUTIVE SUMMARY

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The Pike River Recovery Agency (PRRA) is a New Zealand government department with the responsibility, as the Person Controlling the Business or Undertaking (PCBU) and mine operator of the Pike River mine, to implement the Pike River Re-entry and Recovery Plan (PRPlan).

WorkSafe New Zealand (WSNZ) is another New Zealand government department with the functions of the health and safety regulator for, among other industries, mining operations.

The public and government expectations will be that the PRRA behaves as a model PCBU and mine operator and WSNZ behaves as a model regulator.

This report provides my independent advice to the Chief Executive of WSNZ about the advice in the Exemption Recommendation to the Chief Executive of WSNZ from the Chief Inspector Extractives WSNZ concerning an application for exemption by the PRRA under section 220 of the *Health and Safety at Work Act 2015* (the Act) from compliance with Regulation 170 (4)(a) of the Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016 (the Regulations).

My advice is specific to

- whether forced ventilation can provide an equivalent level of safety for compliance with regulation 170(4)(a) of the Regulations, having regard to the entirety of the controls identified by the PRRA and
- whether the WSNZ description of what is required to ensure an “effective” phenolic plug at paragraph 12 of the Exemption Memorandum is correct.

The scope deals with the

- Planned activities of the PRRA and the Pike River Re-entry and Recovery Plan (PRPlan), “Re-entry Option B - Single Entry (Existing Drift)”, that is the basis for the Pike River Mine operations and the documents that support these activities
- PRRA exemption application and supporting documents a number of which support the PRPlan mentioned above
- WSNZ policy and process relevant to the exemption application
- Documents, legislation and approved codes of practice relevant to the exemption application

The context is as a result of the Pike River Mine Tragedy in 2010, after which, on 31 January 2018, the New Zealand Government established the PRRA as a government department.

The objectives of the PRRA are to conduct a manned recovery of the mine drift, in order to:

- Gather evidence to better understand what happened in 2010 in order to prevent future mining tragedies and to promote accountability for this mining tragedy:
- Give the Pike River families and victims overdue closure and peace of mind and
- Recover remains where possible

The method for preparing this report was to examine some 18 documents plus legislation and authorised codes of practice provided by WSNZ and obtained by research of New Zealand work health and safety legislation.

The information contained in the documents was reviewed to determine the relevance to the PRRA exemption application and the WSNZ approach to consider it and determine the advice and recommendations for the Chief Executive of WSNZ.

My advice is that

- I agree with the advice in the Exemption Recommendation memorandum, i.e. that forced ventilation can provide an equivalent level of safety to compliance with regulation 170(4)(a) of the Regulations, having regard to the entirety of the controls identified by the PRRA, and
- I recommend redrafting the condition containing the description of what is required to ensure an “effective” phenolic plug as follows:

“The phenolic plug must be in place and maintain a sufficiently high atmospheric flow resistance and low leakage flow to allow the area between the fall and the plug to be positively pressurised relative to the ventilation in the open drift and the old mine workings to maintain a nitrogen filled area during the recovery process up to the phenolic plug.”

## SCOPE

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This report deals with matters arising out of the consideration by WorkSafe New Zealand of the PRRA application for exemption from section 170 (4) (a) of the *Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016* and the WSNZ recommendations made.

To address these matters the scope includes examination of the PRRA Exemption Application, relevant New Zealand Work Health and Safety legislation, including the main objective and functions of WSNZ<sup>1</sup>, relevant ACOPs including *Ventilation in Underground Mines and Tunnels, Fire or Explosion in Underground Mines and Tunnels, Air Quality in the Extractives Industry, Ground or Strata Instability in Underground Mines and Tunnels*, and *Emergency Preparedness in Mining and Tunnelling Operations* and the final WSNZ Exemption Recommendation to the Chief Executive of WSNZ.

A number of WSNZ policies are also relevant including the Exemptions Regulatory Function Policy, the Enforcement Regulatory Function Policy and the Enforcement Decision-making Model.

The scope deals with the

- Planned activities of the PRRA and the Pike River Re-entry and Recovery Plan (PRPlan), “Re-entry Option B - Single Entry (Existing Drift)”, that is the basis for the Pike River Mine operations and the documents that support these operations
- PRRA exemption application and supporting documents a number of which support the PRPlan mentioned above
- Policy and process applied by WSNZ to consider the exemption application
- Documents, legislation and approved codes of practice relevant to the exemption application and PRRA operations

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<sup>1</sup> s.9, s.10 WorkSafe New Zealand Act 2013. See Appendix B pp20 and 21

## INTENDED OUTCOME

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The intended outcome is to provide independent advice to the Chief Executive of WorkSafe New Zealand about the exemption recommendations provided by the Chief Inspector Extractives WSNZ concerning an application for exemption by the PRRA under section 220 of the *Health and Safety at Work Act 2015* (the Act) from compliance with Regulation 170 (4)(a) of the Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016 (the Regulations).

It is also intended that the advice is specific regarding

- whether forced ventilation can provide an equivalent level of safety for compliance with regulation 170(4)(a) of the Regulations, having regard to the entirety of the controls identified by the PRRA and
- whether the WSNZ description of what is required to ensure an “effective” phenolic plug at paragraph 12 of the Exemption Memorandum is correct.

## CONTEXT

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Following the Pike River Mine Tragedy in 2010, the bodies of 29 men killed remained inside the Pike River Mine, in the workings and potentially in the drift.

On 31 January 2018, the New Zealand Government established the PRRA as a government department.

The objectives of the PRRA are to conduct a manned recovery of the mine drift, in order to:

- Gather evidence to better understand what happened in 2010 in order to prevent future mining tragedies and to promote accountability for this mining tragedy:
- Give the Pike River families and victims overdue closure and peace of mind and
- Recover remains where possible

The PRRA has developed a plan to safely re-enter the Pike River mine drift, to achieve these key outcomes.

As New Zealand's primary health and safety regulator, WSNZ has kept in close contact with the PRRA as it has worked through its establishment and planning stages. With a decision now made by the PRRA, endorsed by the Minister, to proceed with re-entry of the Mine utilising the existing drift, WSNZ's focus is now on its regulatory role in relation to the re-entry activities of the PRPlan.

The PRRA has now sought an exemption under s.220(1) of the Act of the requirement to comply with clause 170 (4)(a) of the Regulations in respect of the proposed re-entry of the Pike River Mine drift.

The PRRA requests exemption from the requirement that the primary escapeway at an underground coal mining operation, i.e. the Pike River Mine drift, is an intake airway or a combination of intake airways, from the surface to a location in the drift just outbye (before) the roof fall at the inbye end (furthest position in) of the drift.

The PRRA wishes to ventilate the Pike River Mine drift with a forcing ventilation system that would make the primary, and only escapeway, not an intake airway, i.e. it would be a return airway.

## METHOD

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The method for preparing this report was to examine a total of 18 documents plus legislation and authorised codes of practice provided by WSNZ and obtained by research of New Zealand work health and safety legislation.

The information contained in the documents was reviewed to determine the relevance to the PRRA exemption application and the WSNZ approach to consider it and determine the advice and recommendations for the Chief Executive of WSNZ.

The process of examination included detailed review of particular documents, including the applicable legislation.

All document examination was accompanied by note taking and more detailed review of certain parts was carried out where any document raised matters of linkage to legislation, risk management and the purpose of the Act.

The information contained in the documents was also reviewed to determine the relationship between the objectives and safety and health responsibilities of the PRRA and the statutory main objective and functions of WSNZ.

In a previous report I examined a of a total of 90 documents and legislation provided by WSNZ and obtained by research of other New Zealand work health and safety legislation. A number of these documents form the basis of the PRRA Health and Safety Management System complete with all Principal Hazard Management Plans and Principal Control Plans. These documents are relevant to the Exemption Recommendations advice for the Chief Executive of WSNZ.



# Review Outcomes

## Key Considerations

### Legislation

I have taken the widest possible view of legislation that may be relevant to an application for an exemption under the Act. A number of the sections of the Act are included as parts of various WSNZ policies and guidelines, including the *Exemptions - Regulatory Function Policy March 2017*, *Enforcement Regulatory Function Policy August 2017* and the *Enforcement Decision-making Model May 2018*.

Under the *WorkSafe New Zealand Act 2013* WSNZ has a Main Objective at s.9 and Functions s.10 as mentioned above.

Under the *Health and Safety at Work Act 2015* there are several sections to consider, i.e.

- 3 Purpose [of the Act] and in particular  
“(1) The main purpose of this Act is to provide for a balanced framework to secure the health and safety of workers and workplaces by  
(a) protecting workers and other persons against harm to their health, safety, and welfare by eliminating or minimising risks arising from work or from prescribed high-risk plant; and ...  
(d) promoting the provision of advice, information, education, and training in relation to work health and safety; and  
(e) securing compliance with this Act through effective and appropriate compliance and enforcement measures; and  
(f) ensuring appropriate scrutiny and review of actions taken by persons performing functions or exercising powers under this Act;” ... and  
“(2) In furthering subsection (1)(a), regard must be had to the principle that workers and other persons should be given the highest level of protection against harm to their health, safety, and welfare from hazards and risks arising from work or from specified types of plant as is reasonably practicable.”
- 22 Meaning of reasonably practicable
- 36 Primary duty of care applicable to the PRRA as the PCBU
- 37 Duty of PCBU who manages or controls workplace may apply to the PRRA
- 220 Regulator may grant exemption from compliance with regulations applies to WSNZ as the regulator
- 221 Status and publication of exemptions granted by regulator applies to WSNZ as the regulator

In relation to *Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016* WSNZ has developed approved codes of practice (ACOP) that are relevant to the exemption application. These are *Ventilation in Underground Mines and Tunnels Feb 2014*, *Fire or Explosion in Underground Mines and Tunnels Feb 2014*, *Air Quality in the Extractives Industry Sept 2016*, *Ground or*

*Strata Instability in Underground Mines and Tunnels Sept 2016, and Emergency Preparedness in Mining and Tunnelling Operations Aug 2016.*

In applying for an exemption from clause 170 (4)(a) of the Regulations the PRRA should undertake the development of the exemption application bearing in mind not just the specific matter that it is applying for but that it has satisfied itself that it has met its duties and responsibilities for the operations to which the exemption would apply.

Similarly, WSNZ should undertake its consideration of the exemption application both as required by the particular legislation applying to an application for exemption and also considering how the PRRA has met its duties and responsibilities for the operations to which the exemption would apply.

### PRRA Exemption Application

The PRRA has sought an exemption under s.220(1) of the Act of the requirement to comply with clause 170 (4)(a) of the Regulations in respect of the proposed re-entry of the Pike River Mine drift.

The PRRA requests exemption from the requirement that the primary escapeway at an underground coal mining operation, i.e. the Pike River Mine drift, is an intake airway or a combination of intake airways, from the surface to a location in the drift just outbye (before) the roof fall at the inbye end (furthest position in) of the drift.

The PRRA supports the request for the exemption as follows:

1. The method of ventilation proposed involves the use of forcing fresh air through ducting into the working locations in the drift. This commences at the surface and progresses 2,300 metres to the inbye end, where a phenolic resin seal or plug has been installed, by adding ducting as the drift is inspected, re-supported and has necessary plant and equipment installed.

The key issue is the use of forcing ventilation through the duct that then causes the ventilation air that returns to the surface to be "return" air rather than the fresh "intake" air required by clause 170 (4)(a).

As the Pike River Mine drift is a single entry the only way to comply with the clause is to install an exhausting ventilation fan system such that air is drawn into the mine through the drift roadway that workers can readily exit along. An exhausting ventilation fan would be required to achieve this so that the drift became the intake airway.

The PRRA submits that a forcing ventilation system is safer than an exhausting ventilation system.

2. The PRRA presents information in the form of a summary under the headings "Forcing Ventilation", "Risk Assessment for forcing ventilation vs exhaust ventilation", "Risk Assessment for Escape in Return Air", "Additional controls

- identified through the Escape in Return Air Risk Assessment”, “Ventilation and Gas Management Plan – Design Basis and Strategy”, “Entry and Exit Execution Plan” and “Entry and Exit Strategy Risk Assessment” to demonstrate that the forcing ventilation method provides a safer and more robust ventilation method and better manages the risks than the exhausting ventilation method.
3. It is necessary for the PRRA to present such information to demonstrate that, as required by section 220 (2) of the Act, “the extent of the exemption is not broader than is reasonably necessary to address the matters that give rise to the proposed exemption and that the exemption is not inconsistent with the purpose of the Act.
  4. The PRRA provides eight attachments, totalling 861 pages, of risk assessments, management plans, principal control plans, principal hazard management plans and a geotechnical assessment report. These documents demonstrate how the PRRA operation to re-enter the Pike River Mine drift will be undertaken. The documents provide the planning already undertaken by the PRRA and include updated plans and controls developed during 2019. A further two documents, *Pike River Mine - Mine Re-Entry Project Rocsil Plug Seal Resistance Testing Report 15/11/19* (11pages) and *Plug Seal Resistance Testing 17/11/19* (7pages) were also provided to support the exemption application.

Please note that I provided an independent report “Appropriateness of WorkSafe New Zealand Regulatory Activities Arising out of the re-entry activities of the Pike River Recovery Agency” for Michael Hargreaves, General Manager, Better Regulation and Legal Groups, WorkSafe New Zealand in February 2019. Among the matters reported on, relevant to understanding and reviewing the PRRA Exemption Application was whether the key risks associated with the re-entry works were identified and an assessment of the risk assessment process and the recommendations made. My conclusion was that this had been performed rigorously to a high level of quality with practical and achievable outcomes leading to sound final recommendations. Nevertheless I recommended three matters for further consideration;

- i. An exclusion zone around the surface drift entry and ventilation fan intake
- ii. Continuous recording, regular reading and reporting of barometric pressure, and that
- iii. Particular attention should be paid to the control measures and consequence mitigation and containment measures for all tasks involving diesel equipment, including fire prevention, firefighting and escape procedures.

These matters have been addressed with further risk assessments and development of multiple controls in the updated PRRA management and control plans.

5. As well as providing information to demonstrate the requirements of section 220(2) of the Act, the PRRA continues to have the duties of the person controlling the business or undertaking under sections 36 and 37 of the Act, i.e. an exemption does not reduce those duties.

It is my view that the exemption application satisfies the requirements of the legislation and that the PRRA has the necessary system and plans in place to undertake the re-entry operations safely.

## WorkSafe New Zealand Exemption Recommendations

WSNZ has the power to grant exemptions under section 220 of the Act.

The exemption from compliance with any provision of the Regulations can be for any person or class of persons. The PRRA is a person for the purposes of the Act.

WSNZ must be satisfied that the extent of the exemption is not broader than is reasonably necessary to address the matters that gave rise to the proposed exemption and that the exemption is not inconsistent with the purpose of the Act.

### **Extent of the exemption**

Coal mining operations in existence prior to the amendment of clause 170 (4)(a) are not yet required to have 2 separate escapeways.

The Pike River coal mining operation was in existence prior to the amendment.

The operation is now restricted to a single roadway, the drift, that could be ventilated in two ways;

1. Forcing ventilation as it was originally driven as a tunnel, or
2. Exhaust ventilation which requires a change of plant and equipment at the operation to provide a suitable exhaust ventilation fan system.

The PRRA exemption application is specific to the matter of providing an intake air escapeway as required by clause 170 (4)(a).

The PRRA have submitted that forcing ventilation is better suited to the operations at Pike River. It has provided WSNZ with documentation demonstrating this view.

It has also provided documentation that shows how the PRRA will deal with the matters that 170(4)(a) intended to remedy, i.e. the ability for workers to escape from a coal mining operation in intake air.

These plans and controls are necessary for the Pike River drift because it is a single roadway and the provision of an intake roadway by using an exhausting ventilation system does not completely provide a guaranteed intake air escapeway.

This is the case because a fire occurring at any point in the intake airway would pollute the intake and workers are more likely to be in by of such fire. A fire could

occur on diesel equipment used in the recovery operation. The PRRA has a number of strong controls to prevent this and mitigate it if it occurred.

It is my view that the PRRA application for exemption from ensuring that at least 1 of the escapeways at the underground coal mining operation (the Pike River Mine drift) is designated as the primary escapeway and is an intake airway or a combination of adjacent intake airways is not broader than is reasonably necessary to address the matters that gave rise to the proposed exemption.

### **Exemption consistency with the purpose of the Act**

The Purpose of the Act at section 3 subsections (1) (a) to (g) and (2) contains the five requirements I have quoted under the heading Legislation, above, to be met if the purpose of the Act is to be achieved.

I do not believe the exemption, if granted, would be inconsistent with the Act for the following reasons:

The main purpose of the Act is to provide for a balanced framework to secure the health and safety of workers and workplaces by

(a) protecting workers and other persons against harm to their health, safety, and welfare by eliminating or minimising risks arising from work or from prescribed high-risk plant; and ...

(d) promoting the provision of advice, information, education, and training in relation to work health and safety; and

(e) securing compliance with this Act through effective and appropriate compliance and enforcement measures; and

(f) ensuring appropriate scrutiny and review of actions taken by persons performing functions or exercising powers under this Act;" ... and

"(2) In furthering subsection (1)(a), regard must be had to the principle that workers and other persons should be given the highest level of protection against harm to their health, safety, and welfare from hazards and risks arising from work or from specified types of plant as is reasonably practicable."

The PRRA has developed the required Health and Safety Management System complete with all Principal Hazard Management Plans and Principal Control Plans.

This system and these plans have been considered by WSNZ, reviewed, revised where necessary and finalised.

They are the basis for securing the health and safety of workers and workplaces by protecting workers and other persons against harm to their health, safety, and welfare by eliminating or minimising risks arising from work or from prescribed high-risk plant.

Regard has been had to the principle that workers and other persons should be given the highest level of protection against harm to their health, safety, and welfare from

hazards and risks arising from work or from specified types of plant as is reasonably practicable. Note that the requirement for securing health and safety of workers at the highest level of protection is subject to being reasonably practicable as defined in the Act.

WSNZ has provided advice to the PRRA and information has been exchanged so that WSNZ is able to consider the work health and safety of the PRRA re-entry operations. The recommendation to grant the exemption has three terms and conditions attached that become requirements of clause 170 (4)(a) for the PRRA operation and are subject to compliance and enforcement measures.

WSNZ inspectors are well aware of the management system and plans that the PRRA is to use to undertake the re-entry operations and will be able to conduct appropriate inspection and review of the actions taken by the PRRA and its officers who undertake safety-critical roles.

### **What is or is not reasonably practicable**

To implement an exhaust ventilation system would require plant and equipment to be delivered complete with power supply, control and monitoring equipment.

This would require a not insignificant time delay and additional cost for the re-entry operations.

The existing forcing fan would have to be removed and the exhaust fan installed.

Even if the existing power supply, controls and monitoring equipment could be transferred to an exhaust fan system, work would be required to ensure the engineering met legislative requirements.

To change the ventilation system to exhaust would involve specification of the fan characteristics and performance requirements, tender, selection, manufacture, delivery, installation, testing and commissioning.

Once operating, workers would be required to handle and erect rigid ventilation ducting and be put at risk of musculo-skeletal injury that they would not be subject to with forcing ventilation flexible ducting.

The Pit Bottom in Stone (PBIS) roadways will require ventilation. These could be ventilated with either forcing or exhaust main ventilation via branch ducting and or ventilation control devices to direct return air or intake air through the roadways. In either case I would recommend avoiding installing electrical power for auxiliary fans in the drift to ventilate the PBIS roadways.

Considering the effectiveness of forcing and exhaust methods for the specific case of the Pike River Mine drift I conclude that installing an exhaust ventilation system in order to comply with Regulation 170(4)(a) is not reasonably practicable as defined in s.22 of the Act, i.e.

“ ... that which is, or was, at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters, including—

- (a) the likelihood of the hazard or the risk concerned occurring; and
- (b) the degree of harm that might result from the hazard or risk; and
- (c) what the person concerned knows, or ought reasonably to know, about—
  - (i) the hazard or risk; and
  - (ii) ways of eliminating or minimising the risk; and
- (d) the availability and suitability of ways to eliminate or minimise the risk; and
- (e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.”

I believe that the PRRA has addressed all these relevant matters and that changing the ventilation system from forcing to exhaust is not reasonably practicable for the Pike River Mine drift operation.

### **WSNZ procedure to consider the exemption application**

The Chief Inspector Extractives has noted in the Exemption Recommendation that he has followed the principles of the WSNZ *Exemptions Regulatory Function Policy* and ensured the recommendations are proportionate to the situation for which the exemption is sought.

The Exemptions Policy is not prescriptive in its application. It provides a set of principles that can be applied to exemption decisions made by WSNZ.

WSNZ’s “Intervention Approach” in the *Enforcement Regulatory Function Policy* describes how WSNZ will fulfil its regulatory functions. The principles behind the intervention approach are highly relevant and provide the context for the principles that guide exemptions.

The five key features are:

- Targeting regulatory activity through intelligence-led analysis of risk of serious harm and/or fatalities.
- Adopting a high engagement approach involving key agencies, stakeholders and workplaces.
- Practicing credible and proportionate enforcement.
- Expanding the focus from hazards and incidents to incorporate underlying causes (of health and safety problems) and patterns of non-compliance<sup>3</sup>

(including ineffective engagement or participation of workers in health and safety issues).

- Focusing on sustainable improvements in health and safety performance such as finding effective solutions for risk-based issues.

The Exemptions Regulatory Functions Policy guides WSNZ to:

- use a consistent approach in the same or similar circumstances to achieve the same ends.
- act in a visible, predictable and clear way to promote participation and accountability.
- make exemption decisions that are proportionate to the situation for which an exemption is sought.
- support its decisions with the best information available at the time.
- be timely and responsive to the needs of an applicant in making an exemption decision.

The Enforcement Decision-making Model (EDM) flowchart<sup>2</sup> of the overview of the EDM process provides a reasonable process to fulfil the Exemptions Regulatory Functions Policy.

I am aware of a number of matters in relation to the behaviour of the WSNZ Extractives unit through the report I provided in February 2019<sup>3</sup>.

These include:

- a very high engagement with the PRRA
- receipt of information regarding the Pike River Mine re-entry operations from the PRRA, both PRRA developed and from technical experts in various fields
- accessing independent experts to assist the WSNZ Extractives unit to provide reviews of reports provided to it so as to have the best information available at the time

With respect to the Exemption Recommendation I believe that the recommendations to note, the recommended decision and the recommended terms and conditions are proportionate to the situation for which the exemption is sought.

After considering the above matters I agree with the advice in the Exemption Recommendation that forcing ventilation can provide an equivalent level of safety to compliance with regulation 170(4)(a) of the Regulations subject to the terms and conditions of the exemption granted and considering the Health and Safety Management System, Principal Hazard Management Plans and Principal Control Plans that the PRRA has developed.

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<sup>2</sup> Overview of the EDM. FLOWCHART 1: Overview of the EDM process, p.4

<sup>3</sup> "Appropriateness of WorkSafe New Zealand Regulatory Activities Arising out of the re-entry activities of the Pike River Recovery Agency" for Michael Hargreaves, General Manager, Better Regulation and Legal Groups, WorkSafe New Zealand in February 2019.



## Characterisation of the phenolic plug

WSNZ has determined three conditions to be complied with for the exemption to regulation 170(4)(a) to be granted.

Among these is the following:

“The phenolic plug must be in place and effective (having sufficient resistance and low leakage to allow the area between the fall and the plug to be positively pressurised relative to the open drift and the old mine workings to maintain a nitrogen plug) throughout all the recovery process”

The condition uses the word “effective” and then explains its meaning for this condition.

The ventilation testing report and peer review memorandum of the phenolic plug seal and the inbye fall have shown that for the pressures likely to be experienced the ventilation resistance is sufficiently high that the chamber formed between the plug and the fall can be maintained with an inert atmosphere by careful monitoring and adjustment of the nitrogen injection rates into it.

Phenolic seals and phenolic foams have been used in many more hazardous and dynamic situations than that of the plug placed in the Pike River Mine drift. Applications include sealing areas in underground coal mines where spontaneous combustion has developed, sealing goaf areas of gassy mines and injected as a strata binder to help recover roof falls and broken roof ahead of longwall extraction operations.

The phenolic plug will be “effective” if it maintains sufficiently high atmospheric flow resistance and low leakage flow to allow the area between the fall and the plug to be positively pressurised, relative to the ventilation in the open drift and the old mine workings, to maintain a nitrogen filled area.

I recommend removing the word “effective” and drafting the condition as follows:

“The phenolic plug must be in place and maintain a sufficiently high atmospheric flow resistance and low leakage flow to allow the area between the fall and the plug to be positively pressurised relative to the ventilation in the open drift and the old mine workings to maintain a nitrogen filled area during the recovery process up to the phenolic plug.”

## APPENDIX A

### REFERENCE DOCUMENTS

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1. PRRA Application for exemption from r 170(4)(a) of the Health and Safety at Work Mining Operations Regulations 13 09 19
2. PRRA Entry and Exit Execution Plan
3. PRRA Entry and Exit Execution Plan Appendix I
4. PRRA Entry and Exit Execution Plan Appendix II  
Ventilation and Gas Mgt Plan 4b
5. PRRA Entry and Exit Execution Plan Appendix III
6. PRRA Entry and Exit Execution Plan Appendix IV-V
7. PRRA Entry and Exit Execution Plan Appendix V1 - V111
8. PRRA Entry and Exit Execution Plan Appendix IX
9. PRRA4966\_Report\_Pike River Mine Drift Re-Entry Geotechnical Assessment
10. Force vs Exhaust Ventilation RA Review
11. PRA5204-03 Escape in Return Air Risk Assessment Report 2Sept19
12. PRA5204-08 Mine Entry and Exit Risk Assessment Report
13. Emergency Management PCP v3
14. Single Entry of the Drift PHMP v2
15. Exemptions - Regulatory Functions Policy
16. Pike River Mine Re-entry Project - Rocsil Plug Seal Resistance Testing Report
17. M19-010 (Pike River Plug Resistance Peer Review) (R3)
18. FinalmarkupAmended 191017Pike 170(4) exemption analysis TC comments

## APPENDIX B

### LEGISLATIVE EXCERPTS

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#### **WorkSafe New Zealand Act 2013 No 94 (as at 01 December 2017)**

##### **s.9 WorkSafe New Zealand's main objective**

- (1) WorkSafe New Zealand's main objective is to promote and contribute to a balanced framework for securing the health and safety of workers and workplaces.
- (1A) An additional objective of WorkSafe New Zealand is to promote and contribute to the safe supply and use of electricity and gas in New Zealand.
- (2) When performing its functions under the relevant health and safety legislation, WorkSafe New Zealand must act in a way that furthers any relevant objectives or purposes stated in that legislation.

##### **s.10 WorkSafe New Zealand's functions**

WorkSafe New Zealand's functions are to—

- (a) advise on the operation of the work health and safety system, including co-ordination across the different components of the system:
- (b) make recommendations for changes to improve the effectiveness of the work health and safety system, including legislative changes:
- (c) monitor and enforce compliance with relevant health and safety legislation:
- (ca) publish information about—
  - (i) its approach to enforcing compliance with relevant health and safety legislation (including where a provision of relevant health and safety legislation overlaps with a provision in another enactment); and
  - (ii) its performance standards for completing investigations in relation to enforcing compliance with relevant health and safety legislation:
- (d) make recommendations about the level of any funding (including fees or levies) that WorkSafe New Zealand requires to effectively carry out its functions:
- (e) develop codes of practice:
- (ea) develop safe work instruments:
- (f) provide guidance, advice, and information on work health and safety to—
  - (i) persons who have duties under the relevant health and safety legislation; and

- (ii) the public:
- (g) promote and support research, education, and training in work health and safety:
- (h) collect, analyse, and publish statistics and other information relating to work health and safety:
- (i) engage in, promote, and co-ordinate the sharing of information with other agencies and interested persons that contribute to work health and safety:
- (j) foster a co-operative and consultative relationship between persons who have duties under the relevant health and safety legislation and the persons to whom they owe duties and their representatives in relation to work health and safety:
- (ja) foster a co-operative and consultative relationship with the EPA when carrying out its functions, duties, and powers in respect of hazardous substances:
- (k) promote and co-ordinate the implementation of work health and safety initiatives by establishing partnerships or collaborating with other agencies or interested persons in a coherent, efficient, and effective way:
- (l) perform or exercise any other functions or powers conferred on WorkSafe New Zealand by or under any other enactment:
- (m) perform any additional function that the Minister directs under section 112 of the Crown Entities Act 2004.

## **Health and Safety at Work Act 2015 No 70**

### **Subpart 2—Duties of PCBUs**

#### **s.36 Primary duty of care**

(1) A PCBU must ensure, so far as is reasonably practicable, the health and safety of—

(a) workers who work for the PCBU, while the workers are at work in the business or undertaking; and

(b) workers whose activities in carrying out work are influenced or directed by the PCBU, while the workers are carrying out the work.

(2) A PCBU must ensure, so far as is reasonably practicable, that the health and safety of other persons is not put at risk from work carried out as part of the conduct of the business or undertaking.

(3) Without limiting subsection (1) or (2), a PCBU must ensure, so far as is reasonably practicable, —

(a) the provision and maintenance of a work environment that is without risks to health and safety; and

(b) the provision and maintenance of safe plant and structures; and

(c) the provision and maintenance of safe systems of work; and

(d) the safe use, handling, and storage of plant, substances, and structures; and

(e) the provision of adequate facilities for the welfare at work of workers in carrying out work for the business or undertaking, including ensuring access to those facilities; and

(f) the provision of any information, training, instruction, or supervision that is necessary to protect all persons from risks to their health and safety arising from work carried out as part of the conduct of the business or undertaking; and

(g) that the health of workers and the conditions at the workplace are monitored for the purpose of preventing injury or illness of workers arising from the conduct of the business or undertaking.

(4) Subsection (5) applies if—

(a) a worker occupies accommodation that is owned by, or under the management or control of, a PCBU; and

(b) the occupancy is necessary for the purposes of the worker's employment or engagement by the PCBU because other accommodation is not reasonably available.

(5) The PCBU must, so far as is reasonably practicable, maintain the accommodation so that the worker is not exposed to risks to his or her health and safety arising from the accommodation.

(6) A PCBU who is a self-employed person must ensure, so far as is reasonably practicable, his or her own health and safety while at work.

Compare: Model Work Health and Safety Act (Aust) s 19

### **s.37 Duty of PCBU who manages or controls workplace**

(1) A PCBU who manages or controls a workplace must ensure, so far as is reasonably practicable, that the workplace, the means of entering and exiting the workplace, and anything arising from the workplace are without risks to the health and safety of any person.

(2) Despite subsection (1), a PCBU who manages or controls a workplace does not owe a duty under that subsection to any person who is at the workplace for an unlawful purpose.

(3) For the purposes of subsection (1), if the PCBU is conducting a farming business or undertaking, the duty owed by the PCBU under that subsection—

(a) applies only in relation to the farm buildings and any structure or part of the farm immediately surrounding the farm buildings that are necessary for the operation of the business or undertaking:

(b) does not apply in relation to—

(i) the main dwelling house on the farm (if any); or

(ii) any other part of the farm, unless work is being carried out in that part at the time.

(4) In this section, a PCBU who manages or controls a workplace—

(a) means a PCBU to the extent that the business or undertaking involves the management or control (in whole or in part) of the workplace; but

(b) does not include—

(i) the occupier of a residence, unless the residence is occupied for the purposes of, or as part of, the conduct of a business or undertaking;

or

(ii) a prescribed person.

Compare: Model Work Health and Safety Act (Aust) s 20

## APPENDIX C

### AUTHORISED CODES OF PRACTICE

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#### **Authorised codes of practice relevant to the PRRA exemption application**

1. Air Quality in the Extractives Industry, September 2016
2. Emergency Preparedness in Mining and Tunnelling Operations, August 2016
3. Ground or Strata Instability in Underground Mines and Tunnels, September 2016
4. Fire or Explosion in Underground Mines and Tunnels, February 2014
5. Ventilation in Underground Mines and Tunnels, February 2014

#### **Purpose of an authorised code of practice**

The purpose of an Approved Code of Practice is to provide practical guidance to employers, contractors, employees, and all others engaged in work associated with mining, on how they can meet obligations with respect to a control, under the Health and Safety in Employment Act 1992 (HSE Act) and its associated Regulations. It includes outcomes required and operating procedures where there is an identified hazard that requires such control. An Approved Code of Practice applies to anyone who has a duty of care in the circumstances described in the Code – which may include employers, employees, the self-employed, principals to contracts, owners of buildings or plant, consultants and any person involved in the operations.

An Approved Code of Practice does not necessarily contain the only acceptable ways of achieving the standard required by the HSE Act. But, in most cases, compliance will meet the requirements of the HSE Act.

Non-compliance with an Approved Code of Practice is not, of itself, an offence, but failure to comply will require an employer and/or principal to demonstrate that they are controlling hazards to a standard equivalent to or better than that required by the Approved Code of Practice.

#### **Legal status of this document**

A Code of Practice is approved by the Minister under section 20A of the HSE Act. It gives practical advice on how to comply with the law. Following the advice is enough to comply with the law in respect of those specific matters on which the Approved Code of Practice gives advice. Alternative methods to those set out in this Approved Code of Practice may be used in order to comply with the law.



## APPENDIX D

### PREVIOUS REFERENCE DOCUMENTS

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1. 6a. Risk assessment – PRRA Drift recovery\_RAreport\_Final\_Ver5.2\_Part 1
2. 6b. Risk Assessment – PRRA Drift recovery\_RAreport\_Final\_Ver5.2\_Part 2
3. 19122018 - Letter -Pattinson Reply
4. 2018.01.14 Response to Dinghy Pattinson re his request for a further day for the MRE
5. 2018.04.05 Summary Update [UNCLASSIFIED]
6. 2018.04.24 Mine Record Entry Pike River pdf
7. 2018.06.22 Response to Mine Entry Record \_5711737 [UNCLASSIFIED]
8. 2018.07.27 Mine Record Entry Pike River pdf (corrected version)
9. 2018.10.03 Mine Record Entry Pike River pdf
10. 2018.12.3 - 4 Mine Record Entry Pike River Systems Gap Analysis pdf 4Feb2019
11. 2018.12.10 Mine Record Entry Pike River Electrical pdf
12. 2018.12.17 Mine Record Entry HazSubs Pike River
13. 2019.01.10 Intent to drill [UNCLASSIFIED]
14. 2019.01.16 Mine Record Entry Pike River
15. 2019.01.21 PRRA Response to Mine Entry Record (5732532) Hazardous Substance Audit  
21 01 2019
16. 19122018 - Letter -Pattinson Reply.msg
17. 19122018 - Letter -Pattinson Reply.pdf
18. 23112018\_-\_Letter\_-\_Police\_PRDH47
19. ACOP air-quality-extractives-industry-acop
20. ACOP emergency-preparedness-in-mining-and-tunnelling
21. ACOP ground-or-strata-instability
22. ACOP mining-acop-fire-explosion
23. ACOP VENTILATION
24. Acting Underviewer [UNCLASSIFIED]
25. Attendance Table
26. Christmas Examinations [UNCLASSIFIED]
27. DETAILED COST ANALYSIS REPORT final
28. Detailed Drilling JHA Step by Step
29. Detailed Task Analysis report\_v1.1
30. Draft Report H&S System Gap Analysis [UNCLASSIFIED]
31. Electrical Inspectors [UNCLASSIFIED]
32. Electricity Act 1992
33. Electricity Safety Regulations 2010
34. electricity-in-underground-mines-and-tunnels
35. Enforcement Decision-Making Model (EDM)
36. Equipment Selection Matrix
37. FINAL PRRA Technical Experts RFP to publish
38. Final Report 1.0
39. FW Acceptance of Proposed Equipment [UNCLASSIFIED]
40. GC Results PRDH48 26 07 2018
41. hazard-management-system-factsheet

42. Hazardous Substances Visit [UNCLASSIFIED]
43. Health and Safety Critical Control Management Good Practice Guide 2015, ICMM
44. Health and Safety Critical Control Management Implementation Guide 2015, ICMM
45. Health and Safety at Work (Mining Operations & Quarrying Operations) Regs 2016
46. Health and Safety at Work Act 2015
47. Health and Safety at Work General Risk and Workplace Management Regulation
48. Health and Safety at Work Worker Engagement Participation and Representation
49. High-level System Design assessment 3rd and 4th December Greymouth [UNCLASSIFIED]
50. Letter - Alfabs Boar modification
51. Mike H Pike River - roles and responsibilities
52. Mines Rescue Act 2013
53. MRE Pike River Systems Gap Analysis (003) Draft 18Dec2018
54. Non-Pike River Mine Contractor
55. Pike River Site - Post Closure Operating Manual (Ver 12) WorkSafe comments
56. Pike River-Hire QDS BOAR Bolter Specifications
57. Pike River Drilling PHMP
58. Pike River Re-entry Ministerial Briefing 26Oct2017
59. POLICE SPT PLAN DRAFT 171018
60. PR Royal Commission Report-Vol1-whole
61. PR Royal Commission Report-Vol2-Part1-only
62. PR Royal Commission Report-Vol2-Part2-only
63. PRRA & WorkSafe Mining Inspectorate Meeting 14 March 2018
64. PRRA Letter Drilling Programme
65. PRRA Letter Acceptance of Proposed Equipment 18 12 2018
66. PRRA Letter Mine Entry Record #5711737
67. PRRA Worksafe Responses 8 February 2018
68. PRRA Work Schedule
69. Raw Analysis Form 28072018
70. RE Documents from today's visit [UNCLASSIFIED]
71. RE Met Service [UNCLASSIFIED]
72. RE Pike River Mine - Access for Pike River Recovery Agency Staff, DOC Staff and its Contractors [UNCLASSIFIED] 22Feb18
73. RE Pike River Mine - Access for Pike River Recovery Agency Staff, DOC Staff and it's Contractors [UNCLASSIFIED] 21Feb18
74. RE Purging update [UNCLASSIFIED]\_Read
75. RE Q re Camera to use in Coal Mines [UNCLASSIFIED]
76. RE Statutory Role - Mine Surveyor [UNCLASSIFIED]
77. Revised conceptual re-entry plan\_ v0.7 July 18
78. Rob Fyfe to advise Little on Pike
79. Supervisory requirements at Pike River Mine [UNCLASSIFIED]
80. Specifications 6 Person Refuge Chamber Proposal
81. Use of non-intrinsically safe or explosion protected equipment in an ERZO [UNCLASSIFIED]
82. Ventilation - Written step-by-step schematic Version 3
83. Visio-PRRA operational structure final April 2018
84. Visio-PRRA operational structure final December 2018
85. WKS-17-Policy-worksafe-enforcement-policy

86. WorkSafe New Zealand Act 2013 No 94 (as at 01 December 2017), Public Act – New Zealand
87. WorkSafe Answers to Questions from RRegan
88. WorkSafe Responses to PRRA Queries [UNCLASSIFIED]
89. WorkSafe Review of Operational Manual - Pike River [UNCLASSIFIED]
90. Xmas Examination Roster 2018