CARE AND MAINTENANCE
A LOOPHOLE OR LIFELINE?

The Policy and Practice of Mines in Care and Maintenance in Australia.
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The Policy and Practice of Mines in Care and Maintenance in Australia.

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This thesis is presented for the
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Declaration

I declare that this thesis is my own account of my research and contains as its main content work that has not previously been submitted for a degree at any tertiary educational institution.

.........................

M. Pepper
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List of Acronyms
ALP – Australian Labor Party
AMEC – Association of Mining and Exploration Companies
ANZMEC Australia New Zealand Minerals and Energy Council
ASIC – Australian Securities and Investments Commission
BFS – Bankable Feasibility Study
C&M – Care and Maintenance
CCA – Change of Control Assessment
COAG – Council of Australian Governments
CSIRO – Commonwealth Scientific & Industrial Research Organisation
Cth. – Commonwealth
DC – Development Consent
DEM – Department of Energy and Mining (SA)
DES – Department of Environment and Science (QLD)
DEW – Department of Environment and Water (SA)
DEHP – Department Environment Heritage Planning (QLD)
DiIS – Department of Industry, Innovation & Science (Aus)
DITR – Department of Industry, Tourism & Resources (Aus)
DFS – Definitive Feasibility Study
DMIRS – Department of Mines Industry Regulation and Safety (WA)
DNRME – Department of Natural Resources Mines and Energy (QLD)
DPE – Department of Planning & Environment (NSW)
DPIR – Department of Primary Industry & Resources (NT)
DRE – Department of Resources and Energy (NSW)
DRP – Decommissioning and Rehabilitation Plan
DWER – Department of Water and Environment Regulation (WA)
EA – Environmental Authorities
EPA – Environmental Protection Authority
EPBC – Environmental Protection Biodiversity Conservation
ENG0 – Environmental Non-Government Organisations
ER – Earth Resources (Vic)
FID - Final Investment Decision
GFC – Global Financial Crisis
GBM – Geometric Brownian Motion
GMR – Geometric Mean Reversion
ICMM – International Council of Metals and Mining
LoM – life of mine
LPSDP – Leading Practice Sustainable Development
M&M – monitoring and maintenance
MCA – Minerals Council Australia
MCMPR – Mining and Petroleum Resources MMSD-Mining Minerals Sustainable Development
MCP – Mine Closure Plan
MCS – Monte Carlo Simulation
MMA – Mining Management Act
MMP – Mining Management Plan
MNES – Matter of National Environmental Significance
MOP – Mining Operations Plan
MP – Mine Plan
MR – Mean Reversion
MRF – Mining Rehabilitation Fund
MRT – Mineral Resources Tasmania (Tas)
NL – No Liability
NSW – New South Wales
NGO – Non Government Organisation
NT – Northern Territory
PEPR – Program for Environmental Protection and
QLD – Queensland
RPG – Resource Policy Group
RA – Resource Authorities
RMP – Rehabilitation Management Plan
ROV – Real Options Valuation
Senate Inquiry – 2017 Commonwealth Senate Inquiry into Rehabilitation or Mining and Resources Projects as it relates to Commonwealth responsibilities.
Tas – Tasmania
Vic – Victoria
WA – Western Australia
WP – Work Plan

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Abstract

Mine sites that are closed temporarily are often referred to as being in ‘care and maintenance’ (C&M). Mines may go into C&M because of changes to commodity prices, unsafe work conditions, environmental issues or as a way of avoiding mine rehabilitation. Despite modern mine closure policy, changes in community and corporate expectations on mine closure and an ever-growing body of research on technical aspects of mine closure, there is still a disproportionate number of un-remediated mine sites across Australia. The ability to place mines in C&M is just one policy problem that contributes to the absence of closed mine sites. There is an expectation that these sites are being managed and mining will recommence. However, mines may stay in C&M for extended periods, drawing down on companies’ financial resources and putting the company’s ability to recommence or rehabilitate in jeopardy. It is not clear that the policy framework for C&M are fit for purpose.

This study examines contemporary C&M regulations and practices in Australia. Primary research data from interviews with regulators and industry representatives has been used to develop an understanding of how regulations are applied to mines in C&M and to explore tensions and barriers to achieving mine closure. The study highlights the policy environment in which regulations for the mining sector in Australia are formed and tensions at the regulatory level that enables C&M to function as both a ‘loophole and a lifeline’ for miners and governments alike.
Introduction

Mining in Australia is a significant industry with far reaching economic, social and environmental impacts (Geoscience Australia 2020). The Australian mining sector is characterised by industry booms and busts that can determine whether a mine continues to operate, is permanently closed or placed into ‘care and maintenance’ (C&M) (Australia. Department of Industry, Innovation and Science (DIIS) 2016). Campbell et al (2017) estimate that there are between 400 – 2,900 operating mines in Australia, approximately 30+ mines that are closed or undergoing closure, and between 200 and 970 mines in C&M (Table 1.1)\(^1\). In Australia, C&M is commonly used to describe mines that have ceased operations temporarily, with the expectation that mining will recommence. Mines that are in C&M may be referred to as ‘inactive’ ‘suspended’ in ‘temporary closure’ (Australia. DIIS 2016) or in ‘caretaker mode’. Less formally they may be referred to as ‘mothballed’ or ‘shelved’. The aspect of C&M that separates it from other stages of mining is the expectation that closure is temporary and that mining will recommence. In this context, C&M has been identified as a way of avoiding mine closure (Lamb et al 2015; Ashby et al 2016).

Table 1.1: Mines in C&M, operating, undergoing closure, closed, & abandoned - Australia wide (adapted from Table 1 & 2 “Dark Side of the Boom” - Campbell et al 2017).

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>C&amp;M</th>
<th>operating</th>
<th>closure</th>
<th>closed</th>
<th>Abandoned</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW</td>
<td>NA</td>
<td>85 - 109</td>
<td>1 +</td>
<td>1 +</td>
<td>112 - 410</td>
</tr>
<tr>
<td>NT</td>
<td>4 +</td>
<td>6 - 7</td>
<td>unknown</td>
<td>0 +</td>
<td>Unknown</td>
</tr>
<tr>
<td>Qld</td>
<td>19 - 129</td>
<td>147 - 1,207</td>
<td>0 +</td>
<td>0 +</td>
<td>unknown – 15,000</td>
</tr>
<tr>
<td>SA</td>
<td>8 - 151</td>
<td>9 - 783</td>
<td>1 +</td>
<td>18 +</td>
<td>681 – 3,255</td>
</tr>
<tr>
<td>Tas</td>
<td>9</td>
<td>15</td>
<td>4 - 11</td>
<td>1 - 6</td>
<td>unknown -4,200</td>
</tr>
<tr>
<td>Vic</td>
<td>122</td>
<td>47 - 162</td>
<td>2 +</td>
<td>1 +</td>
<td>25 – 19,010</td>
</tr>
<tr>
<td>WA</td>
<td>44 - 438</td>
<td>151 - 661</td>
<td>unknown</td>
<td>unknown</td>
<td>9,870 – 17,000</td>
</tr>
<tr>
<td>Australia</td>
<td>206 - 972 +</td>
<td>460 – 2,944</td>
<td>8 +</td>
<td>22 +</td>
<td>unknown – 58,875</td>
</tr>
</tbody>
</table>

However, it has been suggested that some mines go into C&M with no or diminishing prospects of recommencing (Queensland. Audit Office 2014; New South Wales. Audit Office

---

\(^1\) The most recent figures from the Australian Government Department Geoscience Australia (2015) show 421 operating mines. The WA Department of Mines, Industry and Resource Safety list over 3,000 'active' mines in WA on their online database MINDEX. There are huge inconsistencies across Australia in how mine projects are documented and recorded by their status. It is very hard to gauge an accurate figure for Australian mines by status and of course this number fluctuates.
Historically, it was commonplace for mining companies to abandon mines without closing and rehabilitating the site. Social and political pressure to prevent abandonment has now resulted in legislation and regulations that provide for financial assurances and guidelines for the rehabilitation of mines sites (Brueckner et al. 2013; Glenn et al. 2014; Falck 2016). However, the legacy of the mining industry in Australia is one of unclosed and un-rehabilitated mine sites including over 50,000 abandoned mines (Unger 2012). Despite the increasing body of knowledge about technical aspects of rehabilitation and a shift in sentiment and commitment towards delivering mine closure there has not been a commensurate delivery of closed mines. A lack of mine closure and potential abandonment is largely seen as a policy failure in which C&M may play an important, but poorly documented and understood role (Glenn et al 2014 et al 2015).

This study focuses on understanding the policy context for C&M mines in Australia across six different state jurisdictions and one territory. Australia is a federated nation with three tiers of government (federal, state/territory and local government) (Australian Government 2020). Mining regulation is predominantly the responsibility of state and territory governments. Each state and territory have different policy frameworks that govern mining. Mines in each state operate under a range of legislative requirements that include operating conditions and mine closure and rehabilitation obligations. It is postulated that C&M, whilst being a legitimate phase of a mining operation also contributes to the absence of rehabilitated and closed mines. Mines in C&M have ongoing requirements and costs (Minerals Council of Australia 2017) but do not generate income, thus exposing vulnerable companies to financial collapse (Gilbert & Tobin 2014). The risk for governments and communities is that these mines become abandoned and leave behind, to varying degrees, unsecured environmental and financial liabilities (Ashby et al 2016). In some cases, where oversight is minimal, these mines may already be likened to an abandoned mine.

**Research Objectives**

This thesis asks whether C&M is being used as a loophole by mining companies to avoid their environmental (and social) obligations. To answer this the thesis focuses on understanding C&M as a policy problem in Australia. The objective is to better understand how mines in C&M
are regulated and explain how C&M fits within the broader body of research on mining legacies and mine closure. The objective is addressed based on the following research questions:

- What are the parameters of C&M and how does it fit within the mining lifecycle?
- How does C&M interact with mine closure issues?
- What are the major factors influencing resource regulation?
- How is C&M represented as a policy issue?
- What are the issues with policies that are specific to or can be applied to mines in C&M?
- What are the barriers to delivering mine closure as it relates to C&M?
- How is C&M used as a loophole and, or, a lifeline for companies and government?

Scope

This thesis presents a high-level comparison of C&M policy across state and territory jurisdictions in Australia. Policy research generally seeks to understand the ‘causes and consequences’ of a policy problem and to look for solutions to them (Majchrzak & Markus 2014). The intent of this research is to synthesise a wide range of evidence, opinions and experience to establish what, if any, policy problem exists for C&M. In order to achieve this, three research methods are used: reviewing scholarly literature; a document analysis of relevant grey literature; and interviews with key informants. This method in the field of policy research is described as ‘focused synthesis’ (Doty 1982 – Cited by Majchrzak 2011).

A high-level policy approach was selected to establish an overall understanding of C&M as a policy problem and to consider the complexity of mining and mining policy across Australia. There are many pathways for mines to go in or out of C&M depending on a variety of site specific environmental and, or geological factors, internal corporate factors and external economic or political factors and in some cases labour factors. Mines in Australia tend to go in and out of C&M in response to changes in commodity price, because of economic problems, lower than expected ore grades, the depletion of resources or environmental and safety accidents or risks. Furthermore, each individual mine is unique, because of the local environmental and social contexts, the environmental and mining law and regulations that the
mine is approved under, the economic conditions in which a mine operates and the characteristics of the company operating each mine. For these reasons, a series of individual mine case studies was considered inappropriate. The sample size of case studies across all jurisdictions in Australia to generate some universal understandings about the application of the policy relating to C&M would be prohibitively large. Furthermore, the data available regarding individual mine stages in Australia is incomplete and includes large margins of error (see for example Table 1.1). Thus, reviewing literature and interviews with key informants enables access to first-hand information that provides broad overviews of C&M and policy in each jurisdiction.

This thesis does not seek to quantify the fate of mines in C&M to attribute a level of significance. Identifying all the mines in Australia in C&M, the year they went into C&M, the amount of time they spent in C&M or the prospect of the mines in C&M either recommencing, becoming abandoned, or sold is virtually impossible and beyond the scope of this project. This thesis focuses on the policy tools of regulating mines in C&M to understand how C&M is used either as a loophole to avoid closure or as a lifeline providing opportunity for a company to continue mining and secure the finances to close or as a lifeline for government to avoid new abandoned mines.

**Organisation of Thesis**

Chapter 1 compiles and considers the terminology of care and maintenance and distinguishes C&M from other stages of mining. The purpose of this chapter is to consider some of the ways in which C&M has been defined. It also considers how C&M could be redefined in a more aspirational form whilst acknowledging that the reality of how C&M mines operate may be different, this is then reviewed in the final chapter. The first chapter also considers the movement of mines in and out of C&M and the broader factors that influence that movement.

Chapter 2 examines the policy environment for mines in C&M by considering the background of modern mine closure policy, its drivers and its effectiveness. This chapter describes mine closure as a policy problem and reflects on C&M as a legacy issue, situating C&M in the policy subject area of mine closure. It reviews broader policy environment of C&M by considering international trends on resource regulation, the dynamics of policy development for the
resource sector and considers views of the growing influence of private interests in public policy.

Chapter 3 outlines the research strategy and methodology for the thesis. It describes the approach of mapping the policy environment through document content analysis and describes the interview process with an explanation of the questions, data collection and analysis.

Chapter 4 is based on content analysis of government documents. The chapter begins with a description of the limited role of the Australian Government and goes on to review the regulatory framework for mining in all the states and the Northern Territory (NT) of Australia. Chapter 4 also benchmarks policy discussions relating to C&M in all the states and the NT.

Chapter 5 builds on how C&M is represented in policy discussions by further examination of how C&M is characterised by different groups. This review is based predominantly on submissions to the 2017 Commonwealth Senate Inquiry into rehabilitation of mining and resources projects as it relates to Commonwealth responsibilities (Senate Inquiry) and supplemented by other academic and grey literature.

Chapter 6 analyses interview data combined with grey literature, focusing on the range of policy tools used to manage C&M mines. This chapter describes the policy framework of mines in C&M by addressing individual policy tools rather than separating by jurisdiction. It includes a detailed review of C&M as a stage of mining and offers a definition of C&M with rationale.

Chapter 7 is a critical review of issues that emerged from interviews which addresses the issue of mine closure avoidance more generally. This chapter looks at competing objectives that regulators are faced with, behaviours of companies linked to their size and the underlying vulnerabilities of mines that make managing risk complex.

Chapter 8 is a synthesis of findings from the study, addressing the core research questions outlined above. This sections also considers some options for improved regulations and frames
the issue of C&M as a policy problem within the broader subject of mine closure and describing C&M as both a lifeline and a loophole.
Chapter 1: Understanding Care and Maintenance

This chapter includes a detailed review of the definition and rationale of C&M and other important terminology and considers the movement of mines in and out of C&M. Due to inconsistencies in the use of the term C&M and the absence of clear definitions and regulations for C&M it is important to understand the characteristics that make up C&M, how the term is defined internationally and where C&M fits among other stages of mining. It is important to differentiate C&M from other stages of mining because the expectations and outcomes are different and can create confusion. This chapter links C&M to the broader issue of mine closure and rehabilitation which is expanded on in Chapter 2.

Exploring the causes of mines going into C&M helps understand how C&M is used to avoid mine closure and how C&M interacts with other stages of mining. It is also useful to understand the pathways for mines to come out of C&M. While the expectation of mines in C&M is that they will recommence mining, there are other pathways out of C&M, some of which are problematic, such as abandonment. This review identifies core factors that lead to mine sites going into C&M and the options for C&M mines when recommencing mining becomes untenable.

This chapter is structured to build a greater understanding of the parameters around the phase of C&M, it highlights the absence of a clear and consistent use of the term. Firstly, the characteristics which make C&M unique are considered. International examples and definitions of C&M are reviewed. A broad overview of mining legacies and other phases of mining is included to understand what separates C&M from those phases. The chapter then considers why mines go into C&M and the pathways out of C&M which underpins why C&M is both a legitimate phase of mining, a lifeline and why it can be misused, a loophole.

1.1 Characteristics of Care and Maintenance

Some common elements of C&M that appear in most definitions include: the suspension of mining operations (mining and processing) (Australia. Department of Industry, Innovation and Science (DIIS) 2016; Western Australia. Department of Mines and Petroleum (DMP) 2015); that C&M is a temporary phase, stage or status of mining (Australia. DIIS 2016; WA. DMP 2015); and
that the site continues to be managed (Minerals Council of Australia (MCA), April 2017; Australia. DIIS.2016; WA. DMP 2015).

There are characteristics of C&M that appear in some definitions but not others. These characteristics can be grouped together as ‘reasons’ ‘stage of mining’ and ‘outcomes.’

**Reasons**
- The Minerals Council of Australia (MCA) (2017) includes in their definition that putting a mine in C&M is a choice that a company will make.
- The Minerals Council of Australia (MCA) (2017) and the Australia New Zealand Minerals and Energy Council (ANZMEC) (2000), International Council of Metals and Mining (ICMM) Gilbert & Tobin (2014) all reference commodity price changes as a cause for companies to go into C&M. This is the most commonly cited cause for C&M but it is by no means the only one.
- Lamb, Erskine & Fletcher (2015) add that mines may enter C&M because of high operating costs, changes to policy, community pressure, safety or environmental issues or equipment failures.

**Stage of mining**
- The MCA (2017) and the Queensland Resource Council (QRC) (2018) make a point of differentiating C&M with premature closure or abandonment and reinforce that companies remain liable for sites in C&M or sites that have closed prematurely and state that abandonment is different to both premature closure and C&M.
- The Australian Department of Industry, Innovation and Science (DIIS) (2016) and the WA Department of Mines and Petroleum (DMP) (2015) include in their definition that infrastructure, processing plants and equipment remain in-tact and are being maintained. They both describe C&M as a ‘phase of mining’.

**Outcome**
- Lamb, Erskine & Fletcher (2015) include in their definition the potential for the mine to become viable again and re-open.
- Lamb, Erskine & Fletcher (2015), Ashby et al. (2016), the Audit Office (QLD) (2013) and the Audit Office (NSW) (2017) all identify that C&M can be used as a way of avoiding or postponing rehabilitation.
In Victoria the definition of C&M ascribed to a single mine includes a description of how the site should be maintained to ensure the possibility of restart (Victoria. ER 2019).

The MCA do not equivocally state the outcome of sites in C&M, they simply state that the liability remains with the company and that C&M may last several years.

The Commonwealth and Western Australian (WA) Government definitions do not include an outcome.

Some jurisdictions in Australia do not have a clear definition of C&M but may have requirements for companies relevant to C&M. WA is the only jurisdiction that includes a clear definition of C&M in policy relevant to all mines. Victoria has a definition for C&M, but it is specific to a single mine (Victoria. ER 2019). The NT includes C&M in the definition of Mining Activity and describes C&M as being where other mining activities are suspended. Other jurisdictions use the term C&M but do not provide a detailed definition of the term. In some jurisdictions the terms ‘premature closure’, ‘suspended’, and ‘care and maintenance’ are used interchangeably, or C&M is used to describe what happens to mines that have suspended operations or are temporarily or prematurely closed. Table 1.2 summarises definitions for C&M by jurisdiction.

Table 1.2: Government definitions of care and maintenance in Australia

<table>
<thead>
<tr>
<th>Jurisdiction and reference</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commonwealth of Australia</td>
<td>Care and maintenance: Phase following a temporary cessation of operations, when infrastructure, plant and equipment remain intact and are maintained in the anticipation of production recommencing. May also be referred to as ‘temporary closure; such a site may be referred to as ‘inactive’.</td>
</tr>
<tr>
<td>Leading Practice Sustainable Development Program for the Mining Industry 2016</td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td>NA</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>Mining activity means any of the following activities... (f) operations for the care and maintenance of a mining site when an activity referred to in another paragraph of this definition, except paragraph €, is suspended.</td>
</tr>
<tr>
<td>NT Mining Management Act 2015</td>
<td></td>
</tr>
<tr>
<td>Queensland</td>
<td>NA</td>
</tr>
<tr>
<td>Queensland Audit Office (2013-2014)</td>
<td></td>
</tr>
<tr>
<td>South Australia</td>
<td>NA</td>
</tr>
<tr>
<td>Tasmania</td>
<td>NA</td>
</tr>
</tbody>
</table>
The DIIS (2016) description that “infrastructure, processing plants and equipment remain intact and are being maintained” may be unnecessarily prescriptive. Mines operate under a unique set of variables and there may be a range of scenarios where infrastructure, processing plants and equipment are sold or redeployed. It could be seen that maintaining infrastructure is one way to demonstrate an intention to recommence mining but is not the only way to demonstrate intent.

The NT definition describes C&M as a mining activity and in so doing ascribes to it all the policy requirements for other mining activities but C&M is not differentiated from any other ‘stage’ or ‘phase’ of mining where mining activities are suspended. The Commonwealth and WA definition describes C&M as a ‘phase’ of mining and the Victorian description, explains the point at which C&M commences (Victoria. Earth Resources 2019). Whether or not C&M is ‘a stage of mining’ and where that stage fits in to other stages, is an important part of defining C&M see Table 1.3 below.

The intention that mines in C&M will reopen is another important factor to include in a definition, to clearly state that there is an expectation C&M sites will recommence mining. The Victorian definition is the only definition which suggests a mine in C&M may recommence mining, but it is not clear that the government expect or require that C&M mines will recommence; it simply states to “ensure the possibility of restart.” While there may be an expectation from government that mines will recommence, what is perhaps more important is that companies can demonstrate to government, through their activities on site, that they intend to recommence the mine. The intention to recommence mining sets C&M apart from
‘pre closure’ or ‘post closure’ stages of mining which are distinctly different and establish a clear intention to close a mine.

In the WA Guidelines for Preparing Mine Closure Plans (section 4.12.3) there is a description for mines that have prematurely closed that infers that they are in C&M. “Although practical planning for premature closure (permanent or suspended operations under care and maintenance)...” (WA. DMP 2015). Premature closure and C&M are different things but they are not mutually exclusive. As the WA guidelines suggest, mines that close prematurely may have been in C&M before the decision is made to close prematurely. Industry groups like the MCA argue that premature closure and C&M are different things (Minerals Council of Australia 2017) however it is clear that C&M can lead to premature closure.

The element of ‘choice’ is only seen in the C&M rationale from the MCA. While it is not a choice companies want to make it is none the less a choice companies make independently of government. With the exception of NSW, governments do not approve or deny the change of mines from operating to C&M unless there are specific conditions on a mine lease that C&M needs to be negotiated or is prohibited. Section 70 of the Mining Act (NSW) 1992 No.29 outlines a condition for all mining leases that they must not ‘suspend’ mining without written consent from the Minister. Mines going into C&M still need to abide by any pre-existing conditions on the mine and governments are empowered to change conditions.

Whether or not there are specific policies, procedures or a definition for C&M in each jurisdiction, C&M is still widely considered as a temporary condition in which production and processing have ceased but will eventually recommence. Furthermore, it is universal in the Australian jurisdictions that mines in C&M still have legal requirements to meet environmental conditions, mine closure conditions and other operating conditions unless otherwise negotiated.

1.2 International Definitions
This section considers the use of the term C&M in South Africa and Canada and by the International Council on Mining and Metals (ICMM). ICMM is the peak international mining
industry group and an international leader on industry standards making their views on C&M important. Australia is often compared to South Africa and Canada in literature on mining because of the significance of the sector to these nations (Milaras, McKay & Ahmed 2014; Kabir et al. 2015). Comparisons between either South Africa or Canada may reveal significant differences and/or similarities that can help develop a better understanding of mining as a sector in these nations (Boutilier & Black, 2013; Carrick et al. 2015; Kabir et al. 2015; Klopper & Wessels, 2017; Unger et al. 2015; Weyer et al. 2013).

For example, Kabir et al. (2015) reviewed mine closure practices and planning in Canada and Australia based on ‘long histories of regulation of mining activities’ and similarities with ‘socio-economic, geographic characteristics, as well as large mining sectors’. Similarly, Unger et al. (2015) benchmarks mining ‘best practice’ in British Colombia, Canada with jurisdictions in Australia. Boutilier & Black (2013) compares mining and energy development in regions in Canada and Australia. Weyer et al (2017) look at rehabilitation planning at surface-strip coal mines in South Africa and Australia. Klopper & Wessles (2017) considered abandoned mine policy in Western Australia for adoption in South Africa. Morrison-Saunders et al. (2016) also considered mine rehabilitation policy between eight different African nations and Australian jurisdictions. Carrick et al. (2015) compares ecological restoration in mine rehabilitation in South Africa and Western Australia based on the similarities of biomes and the restoration challenges. Marais et al. (2018) compare the influence of mining boom and bust cycles on mining towns in all three nations in light of their contrasting social, cultural and policy contexts provide insights into the nuanced dynamics of the mining sector. The use of the term C&M in Canada and South Africa are outlined below to provide useful insights into the complexities inherent in the term as well as comparative reference points for understanding how the term C&M is used in Australia

**Canada**

Canada is similar to Australia in having three tiers of government. At a national level in Canada C&M is commonly used to describe the period after mine rehabilitation where ongoing monitoring is required but is also associated with long term environmental liabilities (Cowan et al. 2010). In some provinces, which have a similar governance structure to the states in Australia (Canada. Government of Canada 2018; Australia. Australian Government 2020), there
are various descriptions of C&M that describe a temporary stage of closure (Institut de la statistique du Quebec 2018; Manitoba 2004). Although there are two distinctly different uses of the term C&M no clear definition could be found.

Across the territories, which are comparable to the governance structure of the territories in Australia (Australia. Australian Government 2020; Canada. Government of Canada 2018) there are some variations in the meaning of C&M. For example, in Yukon, C&M is used exclusively in reference to abandoned mines while a closure plan is being developed (Yukon Government 2013). Nanuvut uses the Canadian national meaning of C&M as post closure ‘care and maintenance’ which is also sometimes described as ‘monitoring and maintenance’ (Canada. Minister of Public Works and Government Services 2002). The Northwest Territory describes C&M as ‘temporary closure’ but C&M is also referred to as a requirement for a post closure C&M plan. In a more recent document for the Northwest Territory C&M is described as an interim phase (Brodie 2013).

The Canadian provinces use C&M to describe a ‘temporary’ or ‘interim’ closure which is more closely aligned with the definitions used consistently in Australia to refer to the temporary, suspension of mining, not a post closure phase of monitoring. It is thus apparent that the use of C&M as a term in Canada is not consistent which may create some confusion about C&M and the management of C&M sites across jurisdictions in Canada. This contrasts with Australia where C&M is consistently understood across tiers of government as a temporary suspension of mining.

South Africa
As with Australia and Canada, South Africa also has three tiers of government, but unlike Australia and Canada, mining is primarily regulated by the national government rather than state, territory or provincial government (Republic of South Africa. Department of Mineral Resources 2020). C&M in South Africa was defined in the Minerals Act 1991 (repealed) as “when a mine has stopped production and is temporarily closed for technical, environmental, financial or labour relations reasons” (Rockwell Diamonds 2012, p. 1). Swart (2003) describes a range of mine closure scenarios to demonstrate the confusion over closure regulation in South Africa. In this context Swart (2003, p.2) explains that “Temporary closure (care and
maintenance), where the mine is said to be in a state of care and maintenance when it has stopped production for various technical, environmental, financial or labour related reasons, but the holder has not declared their intent to finally close the mine.” The focus in Swarts definition is that the mine is heading towards closure rather than re-opening.

The Republic of South Africa’s National Environmental Management Act 107 of 1998 - Financial Provision Regulations 2015 has a dedicated chapter to C&M (Chapter 3.16). They outline that a ‘holder’- a mining company- can apply to the Minister for Mines to be placed in C&M. The application should include an explanation on the merits of C&M and must include a C&M plan. C&M is restricted to 5 years, but an approval for C&M must be reviewed annually giving the Minister the option to approve a C&M plan or not. There is a requirement to review financial provisions (bonds) and adjust them annually (Molewa 2015). The Financial Provision Regulations (Molewa 2015) were reviewed in 2017 and amendments gazetted in 2018 which removed C&M specific regulations, the amendments mean C&M plans are no longer required (Gore & Pienaar 2018; Olalde 2018; Swart & Scott 2017).

Despite the state of flux over the regulations for C&M, the terminology appears to be used consistently in South Africa to describe a mine that is temporarily suspended. This terminology is consistent with the meaning of C&M in Australia and some areas in Canada. The consistency in use of the terminology in South Africa can perhaps be attributed to having a single national regulator, rather than having independent mining legislators in each province or state. Consistency in terminology is possible even without a national regulator. Australia uses the term C&M consistently as meaning the temporary suspension of mining even though mining is regulated by individual state and territory governments.

*International Council on Mining and Metals (ICMM)*

The ICMM (2008) define C&M as “Care and maintenance – Period following temporary cessation of operations when infrastructure remains largely intact and the site continues to be managed” (p. 13) which is very close the definitions of C&M used in Australia. The ICMM report (2008) links C&M to “sudden closure” (p. 38). In a more recent report by the ICMM (2019) the following uses of the term C&M are used:
• “Long-term care: to design the closure plan to minimise or eliminate the need for long-term post-closure care and maintenance.” (p. 18)

• In describing “Temporary or Sudden Closure” the ICCM state “This is also called a ‘care and maintenance phase’.” (p. 61 - 63) This section of the report then describes a range of activities, considerations and types of regulatory requirements that may be necessary.

Much like Canada the ICMM use C&M to describe both a temporary cessation of mining and in reference to long-term care and post-closure care and maintenance (ICMM 2019 p. 18). The use of the term C&M to describe both a temporary phase of mining and as a post closure activity is problematic and creates confusion. Despite the inconsistent use of C&M, ICMM does have a specific definition of C&M to mean temporary cessation of mining which is aligned with the definitions used in Australia, South Africa and some jurisdictions in Canada.

1.3 Other Terminology – Where Does Care and Maintenance Fit?

C&M is just one stage of mining, albeit an unplanned stage (Australia. DIIS 2016). There are many planned stages of mining, often referred to as “Life-of-Mine” (LoM). While the primary objectives of mining companies and regulators is to open mines and extract resources, there is a growing community expectation that an equally important objective should be the successful closure of those sites (Falk 2016). This section describes the terminology of the later stages of mining with a focus on mine closure, post closure and legacy mines. A better understanding of this terminology is a precursor to the key insights developed in Chapter 2 addressing LoM and places C&M in the broader literature of mine closure.

Table 1.3 lists the planned mine stages from the Australian Government Department of Industry, Innovation and Science (DIIS) with a description of key activities for each stage of mining. This list is an adaptation of the mine closure handbook from the Leading Practice Sustainable Development Program (LPSDP) (Australia. DIIS 2016). The key activities for each stage of mining do not necessarily reflect the practice of mining companies but shows what is considered leading practice by the Australian Government. This table is revisited in Chapter 6 to create a more detailed table that uses literature and information from interviews. This list is
provided here to give a general understanding around each stage of mining and to briefly consider why C&M isn’t included.

Table 1.3: Mine Stages (adapted from Australia Department of Industry Tourism and Resources (DIIS) 2016)

<table>
<thead>
<tr>
<th>Mine Stages</th>
<th>Description key activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration</td>
<td>Remote sensing, drilling, community consultation, base line environmental data collection, land clearing for tracks and drill pads, water management, waste management</td>
</tr>
<tr>
<td>Feasibility</td>
<td>Feasibility study considering all environmental, social and economic aspects of mining including mine closure</td>
</tr>
<tr>
<td>Planning and design</td>
<td>Consideration of all options for mining with thought to environment, social and economic aspects, community consultation *a critical phase for planning landforms and structures that will support mining and need closure.</td>
</tr>
<tr>
<td>Construction and commissioning</td>
<td>A phase of intensive activity and employment to connect water, power, fuel and chemicals, construct crushing plants, processing facilities, waste rock storage, tailings storage, stockpile areas, accommodation, workshops, offices and roads and community consultation.</td>
</tr>
</tbody>
</table>
| Operations                      | operations commissioning stage – stripping for open pits/ development of declines/ shafts, developing waste rock landforms and Tailings Storage Facilities (TSF)  
                                      mature operations stage – steady operations and production  
                                      pre-closure planning stage – refining closure criteria/ community consultation |
| Decommissioning and closure     | Implementing closure plans, removing infrastructure, decommissioning tailings, reshaping landforms like waste rock landforms, re-establishing surface hydrology, treatment and disposal of wastewater, rehabilitation and remediation, monitoring, community consultation |
| Post closure monitoring and management | Ongoing monitoring and management for any post closure problems, remedial works until relinquishment of                                                                 |

The stages listed above are all planned stages of best practice mining. In Australia, C&M, premature closure and abandonment are considered unexpected or unplanned stages of mining influenced by various unpredictable external or internal factors (Robertson & Blackwell 2014). C&M may occur at any time before mine closure; exploration sites or sites under construction may be put in C&M but it is more common for operating mines to be placed in C&M. Considering the problematic aspect of C&M, being used by some companies to avoid mine closure, it is useful to consider the terminology of the later stages of mining where there can be some confusion.

1.3.1 Mine Closure

‘Mine closure’, ‘decommissioning’ and ‘rehabilitation’ are terms that can be confused and are used interchangeably. The DIIS in Table 1.3 above, use the terminology ‘decommissioning and
closure’, others use the term ‘mine rehabilitation and closure’ or ‘mine site rehabilitation and decommissioning’ (MCA & ANZMEC 2000). In this thesis, the term ‘mine closure’ refers to a stage of mining that describes both the process of decommissioning and rehabilitation of a mine once mining and processing has finished and before a mine site is ‘relinquished’ (WA. DMP, WA Environmental Protection Authority (EPA) 2015).

Mine rehabilitation is “the process used to repair the impacts of mining on the environment” (Australia. Department of Industry, Tourism and Resources (DITR) 2006), to restore ‘physical, chemical, biological quality’ and ‘air, land and water regimes’ (MCA & ANZMEC 2000). Criteria and outcomes for rehabilitation and closure vary between sites. Rehabilitation is also sometimes referred to as remediation or reclamation. Decommissioning describes the dismantling of mine infrastructure including but not limited to; roads, plants, workshops, offices, accommodation facilities, tailings, waste rock dumps, open pits (Australia. DIIS 2016).

Other aspects of closure include impacts to workers, the community, the local economy and future land users. These aspects are an important component in mine closure planning and consultation and extend through every stage of the LoM.

1.3.2 Post Closure

After mine closure processes are complete there is a stage of post closure to test if mine closure criteria are being met and for any failures to emerge and be resolved (Australia. DIIS 2016). This can be described as ‘monitoring and maintenance’ (M&M). M&M is used in some areas in Canada interchangeably with C&M to describe post closure activities (see section 1.2). For some sites where there may be long term risks M&M can continue beyond relinquishment but may be carried out by government or the next land user rather than the company.

‘Relinquishment’ of a mine site happens after mine closure criteria have been met and evaluated (Australia. DIIS 2016). At this point a company no longer holds a title or tenure for the land, bonds or financial assurances are released and responsibility for the site handed over to the government or next land user (Australia. DIIS 2016; WA DMP & WA EPA 2015). There may be a period of M&M carried out by the company before relinquishment and M&M may
continue after relinquishment by government or future land users. There are only a few examples of relinquished mines in Australia (Australia. DIIS 2016).

1.3.3 Legacy Mines

The term legacy mines or mining legacies is used to describe mined land where there is a need for rehabilitation and are “often historic, utilized mining practices now regarded as unsatisfactory and have unclear or disputed ownership” (Worrall et al. 2009, p 1426) and where there may be ongoing problems for the environment or community (Whitbread-Abrutat 2008; Pepper et al 2014). This terminology can apply to mines that are abandoned but may also apply to some mines in C&M which meet that criteria described by Worrall et al. (2009) and Whitebread-Abrutat (2008) as being mined land in need of rehabilitation, that are historic, have unsatisfactory mining practices or unclear or disputed ownership and or ongoing environmental problems.

Abandoned mines are mines that are no longer operating and have not gone through mine closure, where there is no owner or person responsible for the mining tenement that can be held liable for mine closure, or costs. An abandoned mine is formally defined as a “…mine or site where mining leases or titles no longer exist, and responsibility for rehabilitation cannot be allocated to any individual, company or organisation responsible for the original mining activities” (Australia. DIIS 2016, pg. 109). These mines may also be called an orphaned or derelict mine with slight variations in definition in different jurisdictions (Unger et al. 2012; Unger et al. 2015). These mines may also be called a legacy mine or a mining legacy.

The key difference between an abandoned mine and a mine in C&M is based on ownership and the intent to recommence mining. It may be the case that some mines that are listed as being in C&M do not have an owner and there is no intent or ability to recommence mining. These sites may be more appropriately described as being a legacy mine or abandoned.

1.3.4 Care and Maintenance

C&M is not ‘mine closure,’ ‘pre closure,’ ‘premature closure’ or ‘abandoned’ because, in theory, the intent or expectation of a mine in C&M is that mining will recommence and there is an entity, other than government, with which responsibility for the site can be attributed. The
DIIS (2016, p 2) state, “closure may be only temporary in some cases or may lead into a program of care and maintenance. In this sense, the term ‘mine closure’ encompasses a wide range of drivers, processes and outcomes” this confuses what the parameters of ‘mine closure’ are. The terminology ‘mine closure,’ is described in the literature as meaning decommissioning and rehabilitation of a mine (Australia. DIIS 2016). There is no suggestion in literature on C&M (Robertson & Blackwell 2014; Lamb et al. 2015; Ashby et al. 2016; Queensland. Audit Office 2014 & 2017; Campbell et al. 2017) that mines in C&M undertake decommissioning and rehabilitation for closure work. Given that existing definitions of C&M describe the ambition of recommencing operations (Australia. DIIS 2016), linking C&M as a type of closure is problematic.

C&M may occur at any stage of mining, meaning it is not a phase associated with any particular stage of mining. Mines in stages of exploration, feasibility, construction, operation may all be placed in C&M (Northern Territory. Mining Management Act 2015). In some cases, mines may cease operations before closure, with no intention of recommencing, while closure criteria are finalised. It could be argued that this is a phase of ‘pre closure’. In terms of best practice planning, ‘pre closure’ is included as part of the ‘operating phase’ where a company may be finalising closure criteria and negotiations with government and stakeholders (Australia. DIIS 2016). This activity is different from C&M, as ‘pre closure’ is associated with a specific stage (operating) and there is no intention to recommence mining. Importantly, association with all stages of mining and intention to recommence mining are core characteristics of mines in C&M.

1.4 Defining Care and Maintenance

Noting the characteristics of C&M reviewed in this chapter for the purpose of this study, the following aspirational definition will be used, Care and maintenance is an unplanned stage of mining, where there are ongoing requirements to manage the site and meet environmental obligations, with the demonstrated intention to recommence mining within a reasonable time frame and where a company, group or individual, other than government, retains responsibility for the site.
This definition is an aspirational definition, one that helps draw some boundaries around what should be accepted and expected of mines in C&M. It by no means describes the complexity and diversity of how mine sites in C&M operate in practice. This definition is revisited in Chapter 6.3 following discussion on interview data. Chapter 6.3 includes justification for the inclusion of some characteristics of C&M and not others.

1.5 Why do Mines go into Care and Maintenance

There is limited scholarly literature about the cause of mines going into C&M but comparisons can be made between the reasons that mines go into C&M and reasons that mine close prematurely – noting that they are different things. Laurence (2006) provides two examples of mines that were ‘temporarily closed’, both in response to incidents that led to worker fatality. Laurence (2006) more broadly describes the temporary closure as being due to geotechnical problems and regulatory pressure amongst a set of reasons for mines closing prematurely. These include economic reasons, geological reasons, geotechnical reasons, equipment or mechanical failure, regulatory pressure, government policy, community opposition and other reasons (Laurence 2006). Lamb et al. (2015, p 191) summarize that “mines can be prematurely closed because of events such as low commodity prices, high operating costs, equipment failures, safety or environmental breaches, government policy changes or community pressure.”

Reasons why mines go into C&M are outlined below incorporating the issues raised by Laurence (2006) and Lamb et al. (2015) under three discrete categories. Many scenarios and issues fall within these three categories but these three are used to describe aspects specific to C&M. The categories are:

- commodity prices (economic reasons)
- environmental and safety issues (geological/ geotechnical/ regulatory/ equipment or mechanical reasons) and
- resource depletion (geological /economic reasons).
1.5.1 Commodity Prices

A change in commodity price is the most frequently cited cause of mines going in and out of C&M (Lamb et al. 2015; Robertson & Blackwell 2014; Gilbert & Tobin 2014; MCA 2017). Big and cyclical changes in commodity prices are commonly referred to as a ‘boom bust cycle’ (Bhattacharyya & Williamson 2011). These cycles and smaller dips and rise in commodity prices are common and are understood to be ‘commodity price volatility’ (Hansen & Gross 2018). When the price of a commodity drops the economic viability of a mine for that commodity can change. A company may review whether they should continue operating under those economic conditions or put the mine in C&M.

Pindyck (2001) explains that commodities are either traded on the ‘spot market’ or the ‘futures market’. The spot market is for immediate exchange whereas future markets tend to cover supply contracts over a period of time at a set price. Within this framework it is important to understand how producers and consumers seek to protect themselves against commodity price volatility and know that commodities are not just bought and sold but they are also stockpiled, otherwise called ‘inventory holding’.

Pindyck (2001) suggests that producers will hold on to inventories of a commodity which allows them to sell off some of their inventory during periods of high demand on the spot market and replenish inventories during low demand periods. Future markets give security for producers and consumers. Having a set price over a set period of time for a commodity eases the uncertainty of commodity price volatility. Oglend and Kleppe (2017) also discuss this but use the language ‘storage’ rather than inventory; their research focuses on the limitations on capacity for storage and therefore limitations on smoothing commodity volatility. There are also limitations created by the uncertainty of the discovery of new resources and continued supply.

Commodity prices are often referred to by academics and economists as ‘stochastic’\(^2\). Foo et al. (2018) identify a range of models that economists use to try and predict commodity prices these include; the Geometric Brownian Motion (GBM) (Brennan & Schwartz 1985; McDonald &

\(^2\) Stochastic – containing a random element, without a stable pattern or order and is by and large unpredictable (Business Directory 2018)
Siegel 1986 - cited in Foo et al. 2018) and mean reversion (MR) model (Ozorio et al. 2013 cited in Foo et al. 2018) which are used to estimate the “stochastic price behavior”. Either of these two models used in conjunction with the Monte Carlo Simulation (MCS) are used to forecast mineral prices (Foo et al. 2018). Other forecast models include Geometric Mean Reversion (GMR) which is apparently useful for predicting the spot prices for periods greater than 30 years and Real Options Valuation (ROV) a tool to identify the ‘optimal time’ to invest in a new project. The predictability of commodity prices and the economic viability of a mine is complex and adds to the vulnerability of mines going into C&M.

Foo et al. (2018) summarize that “…in the short term, commodity prices might fluctuate randomly up and down in response to economic uncertainties, such as wars or civil revolutions, or in response to changes in government mineral policies, but in the long term commodity prices are drawn back towards the marginal cost of production3” (Foo et al. 2018). The marginal cost of production is based on factors other than just the commodity price just as the volatility of a mine is based not just on commodity price but on a number of factors. Costa Lima & Suslick (2006) explain that the volatility of a mine does not always correlate with commodity price volatility.

Costa et al. (2006) identify that each mine project is different with different “technical and financial characteristics” and that mining is risky because of uncertainties like the ore size and grades which are variable from project to project. Within a single project “the commodity price, taxation, environmental liabilities etc.,” combined with high capital costs, the long-time from exploration to production, risks for regulatory changes in taxation and geological risks and uncertainties all contribute to the volatility. Costa et al. (2006) present a model to calculate a projects volatility using a number of technical and economic parameters including; investment, production, LoM, commodity price, cost of production, risk free interest rate, risk premium, project cash flow, taxation, drift rate of cost of production, drift rate of commodity price, price volatility, costs volatility, correlation between price and cost.

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2 Marginal cost is defined as “the cost of making a single extra unit above the number already planned” (Collin 2006) finding the marginal cost (which can change) will help producers, in this case miners, decide the rate of production to maximise profits – the “marginal cost is thus the lowest amount at which a sale can be made without adding to the producers loss or subtracting from his profits” (Downes 2014).
Costa et al. (2006) highlight the importance of internal factors in combination with external factors like commodity price. Their analysis suggests that companies, while experiencing volatility across many aspects of a mine project, have a greater level of control or the ability to make decisions based on a range of internal factors. Some factors that could be considered internal, based on internal decision making rather than fluctuating external events or factors, include - investment, production, cost of production, drift rate of cost of production, project cash flow and LoM.

Commodity prices play a significant role in the viability of a mining operation and are hard to predict and respond to. Commodity prices are often hard to predict and hence, C&M may in some cases be a legitimate response. There are however other internal, predictable, factors that affect the viability of a mine including - investment, production, cost of production, drift rate of cost of production, project cash flow and LoM (Costa et al. 2006). Mines going into C&M may cite commodity price change as the reason, however it is possible that there are a range of internal and external economic factors that influence the decision, some that may be more predictable than others. This is an important aspect of the policy environment for C&M, to consider what indicators may be apparent and how governments regulate and identify projects at risk, in such a volatile sector.

1.5.2 Safety and Environmental Issues
Mines may go into C&M because of safety and environmental reasons, for example there may be seismic activity that makes the mine site unstable and unsafe to work in. There may be subsidence (sinking of the ground), there may have been a significant breach of environmental conditions that the company is unable to remedy. Infrastructure like tailings dams may have reached capacity and forced the company to stop production. Among the examples below there is evidence that regulators force companies into C&M in response to safety or environmental issues, as well as companies making the decision to go into C&M.

Laurence (2006) identified slope failure as the catalyst for temporary mine closure at the open cut Grasberg mine in West Papua. In WA the Magellan lead mine was forced into C&M by regulators in response to lead contamination at the port (Hutchison 2015). Regulators forced
the Eloise Copper mine in QLD into C&M due to safety concerns (Campbell 2019). In Tasmania the Mt Lyell mine was placed into C&M after two separate incidents resulted in fatalities (ABC 2017). In West Australia the Leinster mine was placed in C&M following a seismic event which made the underground mine operation unsafe (Diss 2013).

1.5.3 Resource Depletion

Resource depletion has also been identified as a cause for mines going into C&M. Resource depletion in this sense means where the highest grades or most economically viable grades of ore have been mined. There may still be a remaining resource to be mined, but mining for lower grade ore may no longer be economic. For example, the Black Star zinc mine in Queensland was placed into C&M having mined its ore reserve (Masige 2016). The Blair Athol mine, also in Queensland, was closed in 2012 when the depletion of ore reserves led the company Rio Tinto to place the mine in C&M (McCarthy 2012; Jacques 2013). Resource depletion may be more closely linked to the avoidance of mine closure given that in these cases the most profitable section of the ore has been mined, creating doubt about the economic viability of the remaining ore.

1.6 Pathways out of C&M

When mines go into C&M and are no longer generating income there is a risk that their owners will fail economically and go into administration or they will sell to smaller companies. In which case they become a C&M legacy mine in extended C&M or in the worst case they are abandoned (Ashby et al. 2016; Lamb et al. 2015). The risk is an economic one where there is an uncertainty about commodity prices and scenarios where recommencement of mining could be feasible. This combined with the ongoing costs of maintenance, staffing, tenement or government fees and the absence of any income from the operation make prolonged C&M unsustainable economically. This section looks at administration, the selling of mines, and considers C&M as a legacy issue with sites being in extended C&M or abandoned.

1.6.1 Selling

Lamb, Erskine & Fletcher (2015) identify a trend for larger, well resourced, companies to sell to smaller companies. Some smaller companies may have smaller operating costs than a larger
company, but this may also mean they are unable to meet environmental, operating or closure requirements. Smaller companies may not be able to make a C&M mine profitable and so will try to sell the site or they may be forced into administration.

Larger companies are also known to create subsidiary companies\(^4\) for individual mine projects. It can be easier to sell the subsidiary company than to sell a mine site which could involve state or territory governments in transferring the tenure and trigger assessment of the financial and technical capacity of the buyer (Queensland. Treasury et al 2018). Queensland Treasury, the Department of Natural Resources, Mines and Energy and the Department of Environment and Science describe why the sale of a company rather than a mine site is favored by companies, “the operation is still being run by the same entity and ownership of the resource authority has not changed, a financial and technical capability assessment is not required. This is despite the ultimate ownership and control of the resource operation changing (e.g. through a share acquisition)” (Queensland. Treasury et al 2018, p.11).

During the initial assessment of a mine project state and territory governments are able to assess and consider a company’s capacity to meet environmental obligations and mine closure criteria. However, state and territory governments have limited options for stopping a company from selling a mine or company to a smaller company who may not meet government expectations around capacity. These powers of review are likely to vary in different jurisdictions. The issue of regulating the change of control of a project is discussed in detail in Chapter 7.5.

**1.6.2 Administration, Receivership and Liquidation**

Mining companies that are struggling financially may go into voluntary, or forced, administration. This involves an external administrator being appointed to take control of the company and investigate the company’s financial viability and advise on its future, for example, whether control be given back to the board or whether the company should go into liquidation.

\(^4\) Subsidiaries, corporate structure and changes in controlling ownership of mining companies is governed by the Federal Corporations Act 2001 and regulated by the Australian Securities and Investments Commission (ASIC), state and the NT governments do not regulate this aspect of mines.
(Australia. Australian Securities and Investment Commission (ASIC) 2018). A company can also go into receivership where “a secured creditor (such as a bank) or the court” appoints a receiver who takes control of a company’s assets (Australia. ASIC 2018). Government statistics do not differentiate between a company in administration or receivership; they are both documented as being in ‘external administration’ (see Table 1.4).

Liquidation is where a company’s assets, under the control of liquidator, are sold and, or distributed to creditors and shareholders (Australia. ASIC 2018). These processes, which are much more complicated than described here, are governed by the Australian Corporations Act 2001 and regulated by ASIC.

It is worth noting that the rate of companies going into administration in the mining sector is significantly less than that of other industries (Australia. ASIC 2019), but a comparison of the rate of administration by sector is not useful for this discussion. Managing the certainty that mining companies do go into administration is important given the environmental, social and financial liabilities associated with mines that go into administration and where mine closure costs and responsibilities are deferred to the government.

Table 1.4: Mining industry entering external administration by state/territory. Adapted from Australian Securities & Investment Commission. (Australia. ASIC 2019)

<table>
<thead>
<tr>
<th>Financial year</th>
<th>NSW</th>
<th>Vic</th>
<th>QLD</th>
<th>SA</th>
<th>WA</th>
<th>Tas</th>
<th>NT</th>
<th>ACT</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-2014</td>
<td>30</td>
<td>24</td>
<td>50</td>
<td>5</td>
<td>36</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>146</td>
</tr>
<tr>
<td>2014-2015</td>
<td>58</td>
<td>31</td>
<td>75</td>
<td>8</td>
<td>55</td>
<td>4</td>
<td>8</td>
<td>1</td>
<td>240</td>
</tr>
<tr>
<td>2015-2016</td>
<td>76</td>
<td>77</td>
<td>60</td>
<td>4</td>
<td>80</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>301</td>
</tr>
<tr>
<td>2016-2017</td>
<td>31</td>
<td>18</td>
<td>59</td>
<td>10</td>
<td>33</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>154</td>
</tr>
<tr>
<td>2017-2018</td>
<td>17</td>
<td>7</td>
<td>19</td>
<td>4</td>
<td>39</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>2018 - 2019</td>
<td>18</td>
<td>18</td>
<td>21</td>
<td>1</td>
<td>45</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>104</td>
</tr>
<tr>
<td>2013 - 2019</td>
<td>230</td>
<td>175</td>
<td>284</td>
<td>32</td>
<td>288</td>
<td>8</td>
<td>12</td>
<td>6</td>
<td>1035</td>
</tr>
</tbody>
</table>

This data does not provide any detail about what types of mining companies or mine projects have gone into administration or about the reasons. Reason may include voluntary administration, a court order, or creditor appointment. The projects may have been an exploration project, an operating mine or a mine in C&M. This data does not tell us anything about whether a company had mines in C&M before they were put into administration.
This data highlights that every year several mining companies will go into administration. Considering that mines in C&M are not financially sustainable, because they are not producing income and have ongoing costs, there is the potential for companies with sites in C&M to be among those companies going into administration. More research is required to establish how many sites in C&M go into administration each year, this could help better understand the scale of the risk of C&M sites being abandoned and assist in the consideration of administration rules.

In Western Australia for example, the State Government Minister for Mines and Petroleum suggested changes to the Commonwealth Corporations Act 2001 (Evans 2018) to provide for an environment ‘creditor’ status. The Minister described “if a person, or company, becomes insolvent and is either wound up or bankrupted; the obligations of rehabilitation fall away. To avoid these rehabilitation costs falling to the State, the Commonwealth Corporations Act 2001 needs to be changed to make the environment a creditor in the circumstance of insolvency or bankruptcy” (WA Government 2017, p.1). This approach appears to be new and untested and would most likely impact other creditors who would be competing with the environment for whatever assets or money could be salvaged by liquidators.

Mine closure could be a very high cost creditor so assigning funds for closure might come at the expense of other creditors like contractors and workers and, or, fall short of the real costs of closure. Administrators, receivers or liquidators, may be able to secure a site without complete closure (decommissioning and rehabilitation) and meet ‘environmental creditor’ requirements. There are a range of policy options around the environment being a ‘creditor’ that are yet to be explored.

1.7 Summary

Little is known about the issue of C&M and how it operates within broader context of mining policy and governance. C&M is poorly defined which may contribute to the potential for C&M to be used as a loophole. The causes for C&M and potential pathways out of C&M are complex and variable and often reliant on external factors such as commodity price in concert with site specific conditions. C&M sites are at a high risk of becoming abandoned. Therefore,
understanding C&M in a policy context is important for considering the role C&M plays as either a loophole facilitating the avoidance of mine closure or as a critical lifeline for companies and how regulatory approaches can protect against its misuse.

C&M is an appendage to discussions on mine closure, premature closure and rehabilitation issues. It is only recently in Australia through the Auditor Generals review in QLD in 2015 that C&M has had dedicated consideration as a policy issue relating to mine closure. Following the revelations in the QLD Auditor General report Australian academics Asbhy et al. (2015), Lamb et al. (2017) and Vivoda et al. (2019) have written more extensively on the topic of C&M as it relates to mine closure, or rather an absence of mine closure. This is reviewed in more detail in Chapter 2.
Chapter 2: The Policy Environment – Life of Mine

A critical objective of the thesis is to understand how C&M interacts with mine closure issues. Another core objective is to understand what the major factors are influencing resource regulation. This chapter seeks to address these major questions in the frame of understanding the ‘policy environment’ (Althaus et al. 2007). Through reviewing existing literature, building on the findings from Chapter 1 which describe the parameters around C&M as a stage of mining.

Firstly, this chapter considers the drivers for developing new mine closure policy and how effective it has been in securing closed mines, describing mine closure as a policy problem and reflecting on C&M as a mine closure and mining legacy issue. This chapter then looks explicitly at C&M as legacy issue by considering the value of C&M as a way of avoiding abandonment, this helps explain C&M as both a loophole and lifeline.

This chapter then moves beyond mine closure and C&M to consider the broader ‘policy environment’ (Althaus et al. 2007) in which mining sector policy is made in Australia. To understand the policy environment, or the political aspect of making policy this chapter studies the international factors that impact how the mining sector is regulated and what drives policy preferences. It then reviews how lobbying and advocacy, political donations and the movement of public servants from the public to the private sector influences policy making.

A range of components make up the ‘policy environment’ that influences what policy choices are made or not made (Althaus et al. 2007; Howlett 2011; Howlett 2009; Maddison & Denniss 2013). Howlett (2011, p. 20) describes that policy making “take(s) place within a larger governance context in which sets of institutions, actors and practices are ‘defined’ which make up the (policy) environment”. This chapter is an overview of the larger context in which regulations for the mining sector are made. Considering the broader factors that influence regulation for the resource sector will facilitate understanding some factors that may have allowed mine closure and C&M to persist as policy problems and the factors that are likely to impact on any proposed reforms.
Life of Mine (LoM) describes everything from exploration, opening a mine to closure and is most often used to describe planning or the scheduling of work that will happen at the site over the designed LoM (Dimitrakopoulos 2011; Malli et al. 2015; Nehring & Cheng 2016). C&M is not traditionally incorporated into LoM scheduling given that it is an unplanned stage of mining, it is none the less part of the LoM of many mine projects.

### 2.1 Mine Closure in Australia

The issue of mine closure in Australia raises two overarching questions: the first is how to ensure that existing and future mines are successfully closed and rehabilitated; the second is how to clean up the unrehabilitated and polluting legacy mine sites across the country. The legacy of unrehabilitated mines across Australia has led to communities demanding better from mining companies (International Institute for Environment and Development (IIED) 2002), often in the form of objecting to new mine projects (Davis & Franks 2011). Governments have also responded, to varying degrees, with new policy (Glenn et al. 2014; Lamb et al. 2015), which is discussed in the following section.

The scale of mining legacies and operating mines is significant. Unger et al. (2012) identifies that there are over 50,000 abandoned mines, across Australia:

- 15,380 in Queensland
- 19,010 in Victoria
- 3,638 in SA
- 4,226 Tasmania
- 9,870 in WA
- 410 in NSW

There are between 400 (Australia. Geoscience Australia (2015); Australia. Senate 2019) and 2,944 (Campbell et al. 2017) operating mines in Australia. The impacts of mining differ significantly depending on the size of the deposit and mine operations, the type of commodity

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5 A study conducted by Campbell et al (2017) identifies a significant issue in the reporting of the status of mines in different jurisdictions in Australia.
being mined, the processing and waste management for that commodity, the receiving environment and the capacity of the company to meet environmental conditions. The challenge for miners and regulators is to effectively and successfully close and rehabilitate mines sites to the standards set out in industry and government guidelines and to meet community expectations which vary from site to site.

Campbell et al. (2017) identify that there are approximately 22 + mine sites that have been successfully closed and 8+ undergoing closure across Australia. The low number of mines that are closed or being closed indicates that there is a significant gap between expectation of mine closure and the achievement of closed mines. In the same report they suggest there are between 200 – 970 mines in C&M. The absence of any significant numbers of closed mines in Australia compared to the high numbers of mines that are abandoned or in C&M would suggest that there is policy problem with achieving mine closure, a problem also identified by Glenn et al. (2014) and linked to C&M by Lamb et al. (2015).

This section will identify some of the drivers for reform on mine closure. These include industry embarrassment, community dissatisfaction and mounting liabilities for government. This section also considers progress on mine closure policy and links to C&M. This should demonstrate that there has been progress towards developing an understanding and commitment towards mine closure, though this has not translated into successful closure outcomes (Lamb et al. 2015). The lack of closure outcomes helps frame why the misuse of C&M to avoid mine closure is increasingly problematic. It is a modern form of abandonment.

2.1.1 Policy Reform Drivers and Response

There is broad acknowledgment that mine closure is important for companies’ reputation and ‘social license to operate’ (Australia. DITR 2006; Glenn et al. 2014; Harvey & Bice 2014; Heyes & Oestrich 2018). The Minerals Council of Australia (MCA) and the Australia and New Zealand Minerals and Energy Council (ANZMEC) (2000) identify that there are ‘changing public priorities and environmental imperatives’ for mine closure and rehabilitation. It is acknowledged by industry that regulations for the sector need change ‘to meet growing community expectations of environmental management’ (MCA & ANZMEC 2000).
There has been significant regulatory reform across Australia (see Table 2.1), dozens of industry, government and academic conferences on mine closures (Pepper et al. 2014) and a growing understanding of effective rehabilitation techniques (Lamb et al. 2015). Table 2.1 shows that all jurisdictions in Australia require some form of ‘mine plan’, which generally has mine closure requirements or a stand-alone mine closure plan. In Queensland, WA and Tasmania there are specific guidelines or requirements for a ‘mine closure plan’.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Policy</th>
<th>Requirements/activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>New South Wales</td>
<td>ESG3: Mining Operations Plan (MOP) Guidelines, September 2013</td>
<td>Requires a Mining Operations Plan (MOP) including a mine closure and rehabilitation plan.</td>
</tr>
<tr>
<td>New South Wales</td>
<td>Mining Act 1992 (261D)</td>
<td>Requires a *bond</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>Mining Management Act 2015 (Division 3. 40) / (Division 4)</td>
<td>Requires a Mining Management Plan (MMP) includes closure plan / requires a *bond and a levy payment as provisions for abandoned mines</td>
</tr>
<tr>
<td>Queensland</td>
<td>Mineral and Energy Resources (Financial Provisioning) Bill 2018</td>
<td>Requires a *bond and provisions for abandoned mines.</td>
</tr>
<tr>
<td>Queensland</td>
<td>Amendments to the Environmental Protection Act 1994 (included in the MERFP Bill 2018)</td>
<td>Requires a Progressive Rehabilitation and Closure Plan (PRCP)</td>
</tr>
<tr>
<td>South Australia</td>
<td>Mining Regulations 2011 - (Part 10/ 40) (Part 9)</td>
<td>Requires a Mine Operations Plan (MOP) and a *bond for non-extractive / minerals mines and a levy for extractives (e.g. gravel, sand, clay)</td>
</tr>
<tr>
<td>Tasmania</td>
<td>Decommissioning &amp; Rehabilitation Plan (DRP) Guidelines 2011</td>
<td>Requires a Decommissioning and Rehabilitation Plan (DRP) (not a statutory requirement but the requirement is seen as consistent with the objects of the Environmental Management and Pollution Control Act 1994 and so a DRP is the responsibility of the Environmental Protection Authority)</td>
</tr>
<tr>
<td>Tasmania</td>
<td>Mineral Resources Development Act 1995 (Division 6) (Division 2)</td>
<td>Requires a *bond. Provisions for abandoned mines.</td>
</tr>
<tr>
<td>Victoria</td>
<td>Mineral Resources (Sustainable Development) Act 1990 No. 92 of 1990 (Part 7)</td>
<td>Requires a rehabilitation plan and a *bond</td>
</tr>
<tr>
<td>Western Australia</td>
<td>Mining Rehabilitation Fund Act 2012</td>
<td>Requires an annual levy payment as provisions for abandoned mines, does not require a bond but retains power for the Minister to require a bond.</td>
</tr>
<tr>
<td>Western Australia</td>
<td>Mining Rehabilitation Fund Regulations 2013</td>
<td></td>
</tr>
<tr>
<td>Western Australia</td>
<td>Guidelines for Preparing Mine Closure Plans 2015</td>
<td>Guidance on preparing a Mine Closure Plan (MCP) which is a statutory requirement.</td>
</tr>
</tbody>
</table>

6 In each jurisdiction mine plans have different titles, for example they could be a Mine Operations Plan, a Mining Proposal or a Mine Plan. Some of different titles of these plans are documented in table 2.

7 The policy reviewed includes legislation, guidelines and handbooks that include requirements for mine closure, rehabilitation, bonds (*bond means financial assurances / bonds/ bank guarantees/ security) and provisions for the rehabilitation of abandoned mines.
Mine closure bonds have generally been adopted as a regulatory tool for ensuring that there are financial resources to close and rehabilitate mines sites. In every jurisdiction in Australia, except for WA, there are requirements for new mine projects to hold bonds, financial assurances, bank guarantees or surety for the mine closure liability. WA (Mining Rehabilitation Fund Act 2012), the NT (Mining Management Act 2001) and Queensland (Mineral and Energy Resources (Financial Provisioning) Bill 2018) require a levy payment, from miners, that goes into a fund that is designed to be used to rehabilitate legacy mines. The levy system relies on funds maturing significantly. Tasmania also has a Rehabilitation Trust Fund funded by royalties, appropriation, sales, bonds and other means (Tasmania. Mineral Resources 2019). The NSW Government allocates funds to the Legacy Mines Program within the Department of Planning and Environment (2020).

The introduction of levy systems for rehabilitation funds and the establishment of legacy mines programs within government are clear policy tools that aim to secure funds and resources to rehabilitate legacy mines (Getty & Morrison-Saunders 2020). The effectiveness of levy systems is still being measured. The implementation of the levy began in WA and the NT in 2013. In WA, a recent review of the Mining Rehabilitation Fund (2012) indicated that progress on rehabilitating legacy mines would not be apparent for many years to come (Marsden & Short 2018). The system in WA has been criticised because it has removed bonds and the incentive that comes with a bond (Getty & Morrison-Saunders 2020).

Regulatory reform for mine closure planning combined with the financial incentives may have been widely adopted, but there is still a large gap in achieving successful closure and relinquishment. Lamb et al. (2015) and Glenn et al. (2014) write specifically about regulatory reform on mine rehabilitation and find that there is yet to be positive outcomes in the form of rehabilitated and relinquished mines. Some academics including Lamb et al. (2015); Ashby, et al. (2016) and others have clearly identified that C&M is used to avoid mine closure, suggesting it is a contributing factor in the lack of closure outcomes.
2.1.2 Policy Failures and Recommendations for Closure Planning

Some of the literature on mine closure\(^8\) calls for specific reforms: for improved standards for calculating and reviewing bonds; the incorporation of progressive rehabilitation requirements; planning for closure; the collection of high-quality base-line environmental data and implementing strong monitoring programs (Cowan et al. 2010; Glenn et al. 2014). Lamb et al. (2015) make the point that mine rehabilitation is complex and more research and funding should be dedicated to the later stages of LoM, but that the real failure in delivering successful mine closure is that policies developed to regulate mine closure in Australia are not working.

Other aspects of closure planning discussed in literature include the reality that returning a mine site to its pre-mining condition may not be feasible or provide for the best environmental outcome (Davis 2015; Glenn et al 2014; Lamb et al. 2015; Ngugi & Nelder 2015). Heyes & Oestrich (2018) suggest that: new and innovative land uses may be overlooked at early stages of mine planning, that restoration may involve government agencies that are not typically involved in mine planning, and younger generations in the community may not be able to engage in mine closure planning in early stages of mining (Heyes & Oestrich 2018).

Another factor that has been included in mine closure policy is addressing community expectations (Australia. DIIS 2016; Burton et al. 2012). The importance of understanding community expectations for closure outcomes is recognised even though they may conflict with what is achievable. Heyes & Oestrich (2018) suggest that flexibility in closure planning to incorporate changing expectations and opportunities over time is important. Vivoda et al. (2019) review the regulatory framework for social impact in mine closure and identify C&M as a way for companies to avoid rehabilitation and externalise the costs leaving liabilities for communities and government.

Others suggest being pragmatic about setting closure criteria that are achievable whilst also delivering the greatest environmental gains and community utility, noting that meeting closure targets may not deliver the best outcomes (Rosa et al. 2019; Davis 2015; Glenn et al. 2014; Lamb et al. 2015; Ngugi 2015). Whatever the mine closure criteria or outcomes are it is...
important that there is meaningful stakeholder engagement over the whole of the LoM towards setting closure criteria to meet agreed post mining land use (Glenn et al 2014; Heyes & Oestrich 2018).

Glenn et al. (2014) suggest that the gap in achieving closed mines is a policy failure and link the failure to a lack of guidance on what might be deemed successful. Lamb et al. (2015) make a direct link between the absence of closed mines and C&M. They conclude that despite legal obligations to close mines there are disappointingly few closed mines. Instead it seems placing mines in C&M has become common. There are likely to be a range of factors that contribute to the lack of closed mines in Australia, this thesis is only concerned with C&M as one of those contributing factors.

2.2 Care and Maintenance as a Legacy Issue

Just as C&M is a way for companies to avoid rehabilitation, so it is a way for governments to avoid abandonment. Ashby et al. (2016, p. 313) identify that “in worst case scenarios, companies simply mothball the site and they become abandoned or legacy sites.” Abandonment is the least desirable option for government who have to assume responsibility for the cost and activities of mine closure drawing on bonds or financial assurances that may or may not reflect the true cost of closure.

Governments’ priorities in avoiding mines becoming abandoned has led to some complacency around the regulation of C&M as discussed in Laurence (2006). For example, Laurence stated:

“Companies and individuals can now be held responsible for environmental damage. Whether the DME or government have the resolve or the resources to chase (mining companies) is another matter. DMEs are reluctant to take responsibility for mine sites because of the costs of recovery. Many sites are on caretaker status and the damage has been done” (p. 295).

While in practice, these sites may have many similarities to an abandoned mine, as long as there is a company who holds the tenements and titles, the site is not considered abandoned (Ministerial Council on Mining and Petroleum Resources (MCMPR) & MCA 2010). Where there may be a risk of a company with a mine in C&M becoming abandoned governments may be
reluctant to take any action which may cause the company to default and generate another abandoned mine.

The Queensland Auditor General also raises complacency as an issue in updating bonds or calling in bonds or other payments, given how precarious a company’s financial health might be (Queensland. Audit Office 2014). While a mine is in C&M there is still a company or individual that, in theory, has the responsibility of closure that the government can hold to account. Without clear regulation on this matter decisions are likely to be made at the discretion of the relevant mines department.

C&M may be more favorable than abandonment because, in theory, it gives government more options for negotiating around closure and selling. However, selling a C&M site and other options do not guarantee that a mine will become operational and profitable, or that it will be closed. In effect, governments are not prepared to take on the closure liability and industry is not prepared to spend the money on rehabilitation (Marlow 2016; Erskine, cited by Main & Schwartz 2015). Therefore, in some cases, C&M may simply prolong the inevitable abandonment of the site or the site may just sit in C&M indefinitely under various companies and conditions. Whether abandoned or in extended C&M there is still an absence of mine closure and in some cases, there may be ongoing environmental degradation and pollution.

Marlow (2016) suggests that an absence of progressive rehabilitation can be a pathway to C&M “if rehabilitation is delayed until after closure, there is the incentive to never formally close the site at all, but instead consign it (and its unfulfilled rehabilitation obligations) to the indefinite limbo of ‘care and maintenance’”(p. 43). Marlow also advocates for the enforcement of progressive rehabilitation requirements as a policy tool to force mine closure activity through the LoM in the hope to prevent closure avoidance and misuse of C&M. An important point here is that the propensity for companies to use C&M to avoid mine closure is enabled by governments’ failure to enforce policies that do exist and a lack of clear policy on the use of C&M.

Lamb et al. (2015, p. 186) observe that “there is an apparent trend for mines to be placed into ‘care and maintenance’ or sold to other entities, to avoid the costs of rehabilitation. Thus, we
are concerned there is a widening gap between what should be possible and what is being done in practice.” Whether as a result of changes to the commodity price, safety and environmental issues, or in response to resource depletion, mines entering C&M may be used to avoid mine closure by companies and are allowed to by government in a bid to avoid the abandonment of mines in C&M, contributing to the absence of mine closure in Australia.

2.3 Globalisation and Resource Nationalism – policy preferences

International trends make up an important part of the policy environment for the mining sector because mining is traded internationally, is affected by global commodity prices and almost always requires foreign investment (Davis & Vasquez Cordano 2011). The two primary trends important for this thesis are ‘globalisation’, and ‘resource nationalism’. The first is a concern for industry the second is a concern for public interest. Globalisation is the phenomenon of governments supporting and facilitating international trade and the development of trade agreements between countries, this is achieved predominantly through de-regulation and privatisation (Pierre 2015; Potrafke 2015). ‘Resource nationalism’ is a term that describes “a strategy where governments use economic nationalist policies to improve local returns from resource industries” (Wilson 2015, p. 400). These policy trends exist in a paradigm where countries are competing to attract foreign investment which favours deregulation.

Globalisation coincided with the promotion of free market economics and a corporate focus on profit maximisation (Urzua 2000). Profit maximisation is the ambition of corporations not governments, however governments have traditionally been sympathetic to the goals of corporations in order to attract investment, promote economic activity and create jobs (Jones 2000). Profit maximisation is associated with corporations favouring jurisdictions with low costs, and minimal regulatory requirements, deregulation and low political risk (Jones 2000; Knill & Lehmkuhl 2002; Maddison & Denniss 2013). Countries that adopt policies to support globalisation are likely to be more attractive as an investment destination to profit driven industry, making globalisation an important consideration in the policy environment. Vivoda et al. (2019) describe these types of policies as ‘enabling’, these may include a range of incentives such as tax breaks and subsidies.
‘Resource nationalist’ policies⁹ have emerged in several resource rich developed and developing countries, (Wilson 2015; Broad & Fischer-Mackey 2017). Vivoda et al. (2019) describe policies that safeguard society and environment as restrictive. Examples of resource nationalist policies include:

- changes to tax to increase the public share of profits (Ernst & Young 2018; Wilson 2015)
- reclaiming private land as public land through expropriation (Wilson 2015)
- restrictions on corporate structure to ensure a greater percentage of the company ownership is either state owned or owned by a local company (Wilson 2015)
- local content requirements to purchase local materials and use local labour or power (Ernst & Young 2018; Macatangay 2016; Munson & Rosenblatt 1997)
- policies that prioritise or have stricter requirements for the environment (Broad & Fischer-Mackey 2017; Ernst & Young 2018).

The emergence or re-emergence of resource nationalist regulation in some countries could create a stronger environment for resource nationalist policies in other resource rich countries, a trend that some in the industry see as less favourable. The International Council of Metals and Mining (ICMM) raises resource nationalism as a ‘regulatory risk’ and one of four trends impacting the metals sector in 2018 (ICMM – cited by Ernst and Young 2018). Uncertainty about environmental regulation is more of a barrier to investors than the actual regulations (Aragon-Correa & Pinske 2011).

Resource nationalism is currently not part of the Australian government’s policy agenda. The Liberal-National Government has been in power in Australia since 2013, a coalition of traditionally conservative political parties, the Liberal party and the National party. In a 2017 speech made to the MCA the former Liberal-National Prime Minister Malcolm Turnbull (Turnbull 2015-2018) explained that the federal government’s policy agenda for the mining sector includes trade deals and tax cuts to increase Australia’s competitiveness and encourage

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⁹ Not all of these policies have been formally described as ‘resource nationalist’ policies but it has been shown that the government intent in introducing these policies is aimed at delivering a better local outcome which fits with the premise of ‘resource nationalism’ described by Wilson (2015).
investment (Turnbull 2017). Thirty years earlier in a speech by former ALP Prime Minister Bob Hawke (Hawke 1983 – 1991) to the Australian Mining Industry Council similar sentiments were made about reducing regulation, export controls, trade impediments and being sympathetic to the economic challenges that face the industry.

However, subtle differences are evident in the two approaches that shed some light on the current policy environment. In 1987, Prime Minister Hawke spoke strongly about protecting the national interest, Aboriginal interests and the importance of the environment and heritage (Hawke 1987). Both LNP and ALP governments have supported the mining industry with variations in the emphasis. These variations are likely due to slight differences in the political ideology of each party (Lindy 2013). There have been changes over time in the broader policy setting of globalisation and deregulation and the popularity of mining in the Australian psyche which has not always been favourable (Swan 2012), but there remains strong political support for the mining sector within the Liberal Party and the ALP.

The aims of globalisation and resource nationalism have a different focus, but they are not mutually exclusive. Countries that adopt enabling policies that encourage international trade and deregulation of trade may also adopt restrictive policies that seek to deliver better environmental and social outcomes and a greater share of the benefits. It is argued that effective regulation of the mining sector is reliant on striking a balance between enabling and restrictive policy (Vivoda et al. 2019). The resource sector in Australia is not immune from globalisation and the issues that arise with competing internationally. Nor is Australia immune from the environmental impacts of resource extraction and a shift in public sentiment towards demanding a greater share of benefit and smaller negative environmental impact from the mining sector.

2.4 Public Vs. Private Interests in Policy

In the context of regulation for the mining sector in Australia what is in the public interest is likely to be disputed by different interest groups. Industry and the federal government have a propensity to frame the mining sector’s contribution to the economy and jobs as delivering a public benefit. Other groups are more inclined to frame the mining sector as threatening the
environment and workers which need protection – through regulation, or to highlight the public benefit of a healthy environment and the disproportionate private benefit from mining.

Public Interest Theory has two major concepts (Hantke-Domas 2003). The first, based on early discussion from Stigler (1971) and Posner (1974), suggests that regulation “seeks the protection and benefit of the public at large” (Hantke-Domas 2003, p. 166). The second - “that when markets fail economic regulation should be imposed to maximise social welfare” (Hantke-Domas 2003, p. 166). The overarching idea is that policy is developed for the good of the public, which of course can take many forms.

The development of regulation is driven by the benefit of interest groups who have electoral or monetary influence (Stilger 1971; Posner 1974) which suggests that the driver for policy is not the broader public interest but that of private interest or a section of society that is influential. It is argued that neither regulation in the public interest or economic theory have primacy over the other and that public interest theory does not rely on market imperfections but is driven by the objective of the group lobbying or campaigning for the regulation (Tanguay et al. 2003) resulting in a melding of both the public interest theory and economic theory of regulation.

This section does not seek to justify whether mining generally is in the public interest or not, rather the purpose is to consider how the formation of policy for the mining sector is influenced by the methods used to advance private interests. The mining sector in Australia has been used as an example to explain how private interests pose a threat to the public interest in Australia (Wilson 2016; Bell & Hindmoor 2014; Boulus & Dowding 2014; Garnaut 2013; Kelly 2013; Allen 2011). Within this discourse the following sections consider that private interests seek an outcome that is favourable to industry, which may have both a positive and negative impact on the public, this is consistent with the economic theory of regulation.

The former Australian Federal Treasurer Wayne Swan, in the Rudd Labor Government (2007 – 13), described the threat of private interests over public interests unequivocally:

*But Australia’s fair go is today under threat from a new source. To be blunt, the rising power of vested interests is undermining our equality and threatening our democracy... A handful of vested interests that have pocketed*
a disproportionate share of the nation’s economic success now feel they have a right to shape Australia’s future to satisfy their own self-interest (Swan 2012, p.1).

The growing influence, power and tactics used to pursue private interests are increasingly seen as a threat to democracy and public policy (Garnaut 2013). While many of these issues are not unique to the mining sector, they are evident in the Australian mining sector. This section focuses on identifying some problematic lobbying practices more generally and some specific issues with political donations and the movement of public sector personnel to the private sector. The evidence below suggests that in the face of regulatory threats the mining sector has a strong and coordinated response that seeks to serve private interests. Consequently, it has significant influence over the policy agenda for the resource sector.

2.4.1 Lobbying – Private and Public

Lobbying is not just done by industry interest groups. There are environment, community, and many other interest groups that engage in lobbying or advocacy. These groups, sometimes referred to as the “third sector”, are not for profits or NGOs and think tanks and they are “usually democratically controlled” (Althaus et al. 2007). They play a significant role in policy discussions by providing information (Susman 2008) and they are powerful because they represent members and can influence voting in democratic elections (Althaus et al. 2007). They may also threaten litigation or more radical actions that can disrupt projects and processes (Berney & Rootes 2018). Research from America suggests that many NGOs do not consider their work to be lobbying, though closely linked to public policy (Balassiano & Chandler 2010).

The issues NGOs focus on, or the methods they use to pursue their objective, may be impacted by donors (Heyes & Oestrich 2018), and whether or not they receive government funding (Bloodgood & Tremblay-Boire 2017). Whether described as lobbying, advocacy or campaigning, there is clear involvement from Australian ENGOs in policy reform processes. This was evident in the review of submissions to the Senate Inquiry on mine rehabilitation. How much power, influence and how effective they are is another question, outside the scope of this study and likely to vary depending on the issue and the political and policy environment.
Some of the processes used for lobbying in the Australian mining sector are described by the Association of Mining and Exploration Companies (AMEC 2018) in a way that also describes the industry’s objective. AMEC highlight that they make 150 + “submissions and representations to government on behalf of the industry’ every year” (AMEC 2018, p. 1). They claim that they have “saved the industry millions of dollars by being willing to challenge public policy issues and advocate crucial initiatives to reduce the cost of doing business for the industry and increase Australian mineral exploration and discovery” (AMEC 2018, p. 1). They also explain they have “access to Ministers, leading politicians and Government decision-makers in Federal, State and Territory jurisdictions. We use these relationships to address public policy issues and implement positive change” (AMEC 2018, p. 1).

Lobbying is part of a healthy democracy and political process, Susman (2008) summarises that lobbying is crucial in public policy, despite its potential to corrupt decision making, because “issues are too complex, the public too dispersed, and competing voices too cacophonous to rely exclusively on town hall meetings and citizen action to keep elected officials informed of constituent interests” (Susman 2008, p. 2). Garnaut (2013) and Susman (2008) point out the importance of a moral code to making political structures work and suggest that increasingly there is an absence of morality in lobbying.

Policy makers must weigh up the views and interests of different stakeholders, but that is problematic where there is an imbalance in how private interests influence policy. Juntti et al. (2009) observe that the tensions between public and private interests in making policy for the environment can involve economic, social and environmental compromises. Different interest groups will try to influence policy - for example industry will advocate for policy that favours industry, environment groups will advocate for the environment, unions will advocate for workers. An imbalance is apparent when democratically elected government officials make decisions that so clearly favour private interests and sometimes at the expense of a greater public interest. This is a scenario that has been identified within the Australian political environment and the mining sector (Swan 2012; Garnaut 2013).
2.4.2 Political Donations

Political donations by private companies to political parties is a practice that is legal in Australia. There are public reporting requirements for expenditure, but donations can be made by an ‘associated entity’ (Ramsay, Stapledon & Vernon 2001) so the actual source of the donation is difficult to track. For example, the major Australian political parties, the ALP and the Liberal Party have a number of organisations that fundraise for them; those organisations then donate to the political party and this is publicly reported (Edwards 2018). Where those organisations source their funds are difficult to track (Edwards 2018).

This type of more general corporate practice, beyond the mining sector, was described during a corruption inquiry in Queensland; “practices which were adopted with respect to donations included a propensity to accept large sums in cash, not infrequently from those who had benefited, or hoped to benefit from dealings with the Government... “ (cited in Ramsay et al. 2001, p. 180). It is suggested that more research is required into the impact of political donations on our political processes but there are indications that political donations and income received by political parties are “derived from payments seeking influence” (Edwards 2018, p. 402).

Barriers to delivering policy in the public interest are described by Garnaut (2013) who identifies, with regard to the mining sector, the practice of leaders taking payments and in return delivering policies that favour one group above another. He explains that the inhibition of groups to campaign for their private interests with little regard for the public interest represents a failure in the capitalist system, that was once influenced by a moral code to deliver policies in the public interest. Corruption, rent seeking, and “pandering to lobby groups at the expense of the community” (Blumm 1992- cited by Sinclair 1997, p. 546) are further examples of a policy environment that is conducive to a disproportionate influence from the mining sector, threatening our democracy, public interests, and the development of the best possible regulations for mining, including mine closure and C&M.

2.4.3 The Revolving Door

The ‘revolving door’ of government and the private sector describes a phenomenon where people from the public sector move from jobs with government to private companies or lobby
groups (Lazarus et al. 2016). This is not unique to Australia or the mining sector (Dorrenbacher 2016). The ‘revolving door’ gives the private sector an advantage in their capacity to lobby; whether the people moving from the public sector be former policy advisors, cabinet ministers, or bureaucrats they have insights into internal decision-making processes and power dynamics. They also have access and connections to government and could have internal power or influence within government (Dorrenbacher 2016).

In the mining sector in Australia there are accounts of the ‘revolving door’ with high level public officials taking up positions in the private sector. According to Lucas (2018) “24 former senior politicians held advisory or fiduciary relations with fossil and/or mining interests”, and “107 former and current political advisors held advisory or fiduciary relations with fossil and/or mining interests” (Lucas 2018). This includes lobbying firms10, mining companies, peak bodies and energy companies. Notably two former federal Mines Ministers have, at the end of their political careers, immediately taken up employment in the mining/petroleum industry; Martin Ferguson (Australian Petroleum Production & Exploration Association 2013) and Ian MacFarlane (Queensland Resource Council 2018). Given the expertise, experience and insights of former government staff now working in the mining sector it could be considered that the mining sector has a significant advantage over other interest groups in influencing policy.

2.5 Summary - The Policy Environment for Mining Sector Regulatory Reform

This chapter supports the idea that C&M acts as both a loophole and a lifeline for companies and governments. Miners and government both clearly want to avoid abandonment of mines but are yet to find a way to manage the dynamics that make the resource sector so volatile and the industry as a whole so averse to mine closure. The precarious financial position of some mines, the high risk of abandonment, the limited options for governments to effectively regulate to force mine closure. These may all be considered as reasons why C&M has been able to go unregulated for so long avoiding both closure and abandonment.

This chapter also considered the broader policy environment for the mining sector and has identified that the mining sector in Australia has an advantage over other interest groups;

10 There are 240 private lobbying firms that are registered to operate in Australia (Department of the Prime Minister and Cabinet 2018).
whether through effective and aggressive lobbying, the practice of giving political donations, or through greater accessibility to government. If industry decides they do not like a policy position taken by a political party they can choose not to donate to that party and they have a strong set of tools and the capacity to lobby, negotiate and affect policy and more importantly the threat that they will use them (Edwards 2018).

The disproportionate power of the mining sector is an important consideration in the policy environment. Policy makers in Australia are under substantial pressure from the mining industry to make policy favouring the mining sector which includes deregulation and more enabling policies. Garnaut (2013) suggests that the Australian government is failing to uphold the public interest against this pressure. This may also be seen as a failure to strike a balance between enabling and restrictive policies.

Chapter 3 describes the research strategy and methods. Chapter 4 presents findings on the policy framework for the mining sector nationally and in all Australian states and the Northern Territory and considers the current policy discussions on mine closure and C&M. Chapter 5 considers the representation of C&M as a policy issue by different groups and through the policy of different jurisdictions in Australia. The subsequent chapters consider interview data from regulators and industry; reviewing the policy tools and mechanisms used to regulate mines in C&M; and identifying tensions that exist that influence mine closure. These chapters, while focused on C&M, address the broader issue on how and why it is that companies can evade mine closure. It is instructive for these chapters to follow from the discussions here on the policy environment, having identified the links between C&M and mine closure and the broader policy landscape that influences policy choices for regulating the mining sector.
Chapter 3: Research Strategy and Methods

This chapter outlines the research strategy and methods used to answer the thesis question - how can C&M be understood as a policy problem. First, the research strategy is explained broadly and then the methodology is described in two discrete parts: document content analysis and key informant interviews. The section on content analysis describes the process of reviewing policies and the process of reviewing submissions to the Senate Inquiry as two specific and critical data sets. The section on interviews describes the approach taken in developing questions, conducting interviews and analysing the data.

The core approach to reviewing C&M as a policy problem has been to place C&M in the broader policy area of mine closure and legacy mines. To do this, the thesis considered the policy environment: first describing the background of policy changes in response to mine closure issues, identifying the perceptions about the benefits or problems with C&M; and then looking at trends and influencing factors internationally and nationally impacting the formation of policy for the mining sector in Australia. The consideration of specific problems with policy tools and the application of those tools to effectively manage C&M is done by analysing responses from interviewees and reviewing existing policy. This also provides unique insights about more general barriers to achieving mine closure.

Policy research seeks to understand the ‘causes and consequences’ of a policy problem and to look for ways to deal with those problems (Majchrzak & Markus 2014). The method of reviewing literature, grey literature, content analysis and conducting interviews seeks to pull together a wide range of data, evidence, opinions and experience to establish what the C&M policy problem is. This method of policy research is described as ‘focused synthesis’ (Doty 1982 – Cited by Majchrzak 2011). This research is focused on understanding the problem and less focused on measuring the problem or on analysing the range of potential remedies.

In seeking to understand the problem in a policy context it has been instructive to consider that policy is not based solely on rational choices or evidence (Howlett 2011). There are a range of economic and political components that influence policy. Part of the strategy for understanding the policy issue of C&M has been to study the environment in which policy is
made (Bacchi 2009; Howlett 2009; Maddison & Dennis 2013), to consider how the problem is represented (see Chapter 5) (Bacchi 2009) and to reflect on influencing factors that impact policy choices and options.

The lenses through which the policy problem of C&M is viewed might be described as a “causal story” in which there is an attempt to move the problem from an intellectual problem to one where there is understanding about its cause and in turn agency to address the problem (Stone 1989). Stone (1989) offers types of causal theory as accidental, inadvertent, intentional, mechanical or complex (Stone 1989 p. 285). To describe the cause Stone considered that actions are either unguided or conversely purposeful and that consequences may be either intended or unintended and the cause either inadvertent, accidental, mechanical or intentional. The causal story is explored through the review of interview data in which the policy tools and their application and outcomes are considered.

The research strategy taken for this thesis seeks to firstly understand the existing policy for mine closure and drivers for reform and then the broader policy landscape of power influence and economic and regulatory ideology which influence the policy choices. Then to understand the regulatory framework specific to the issues of C&M, the actual practice of regulating C&M mines and finally to investigate what broader conflicts exist that impact how C&M sites are managed. The methods for carrying out this investigation are described below.

3.1 Document Content Analysis

Grey literature from government and industry was reviewed to map the existing regulations and regulators for mining, specific to C&M and mine closure, presented in Chapter 4 and used intermittently in Chapter 6 supplementing information and analysis of interview data. Grey literature and submissions to the Commonwealth Senate Inquiry on mine rehabilitation are reviewed to identify how the issue of C&M is presented by different groups and in different forums. More details on analysing information from policies and submissions are presented below.
The content analysis approach taken could be described as conceptual analysis in which data was collated and arranged by theme, concept or key words (Wilson 2011). The interview transcripts were analysed using manual coding to identify common issues and then develop the issues into key themes (Mayring 2000; Neuendorf 2017).

### 3.1.1 Policies

Policies (including legislation, guidelines, discussion papers, audit reports and explanatory notes) for each state and the NT were downloaded and systematically reviewed to identify specific regulations for C&M (see Appendix 1). Relevant policies were identified through a combination of reading submissions to government from the MCA who identify mining related policies in each jurisdiction, and through searching government departmental websites to identify policies and guidelines and discussion papers. Government legislation websites were also used to search for legislation administered by the appropriate mines department.

The relevant policies were downloaded and searched for key words; ‘care and maintenance’, ‘premature’ and ‘temporary’, and ‘moth’ (to identify mothball, mothballed, mothballing). Later another search was done to include the words ‘suspen(d)(sion)’ and ‘inactive’ as it came became clear when reviewing the documents that these words were frequently used to describe C&M. The search for these key words was based on the terminology identified through the literature review as being key words to describe care and maintenance. The word ‘temporary’ and ‘suspen(d)(sion)’ came up often but not in reference to C&M so this was marked with ‘NA (in relation to C&M)’ to indicate the word temporary or suspen(d)(sion) appears in the policy but is not relevant to this study. A human coded approach to this search was critical because the use of some words such as ‘temporary’ or ‘suspen(d)(sion)’ or ‘inactive’ or ‘premature’ could be used in a variety of contexts not all meaning C&M.

The policies identified for each Australian state and the NT were specific to mining and or environment. There was no expectation that there would be anything specific in environment policies addressing C&M, but it was important to review environment policies as it is common in some jurisdictions for the environment departments to manage some aspects of mines in C&M.
Specific mentions of C&M were reviewed and compiled in Tables 4.2.1 – 4.2.7. Summaries of the policy framework and policy discussion relating to C&M are detailed in Chapter 4.2. This information was used again and considered in conjunction with information gathered from interviewing regulators in each jurisdiction, discussed in Chapter 6. This combination of information sources was used to develop a clear understanding of what policies are applied to C&M sites and where there are gaps or problem areas.

Chapter 4.1 identifies the Australian government agencies that have some involvement in mining. To describe the role of the Australian government in both regulating mines and influencing policy for mining in different jurisdictions a review of federal policies was conducted based on information from Geoscience Australia. Areas of Australian government influence on mining regulations were considered by drawing heavily on policy discussion papers to identify the policy agenda and its significance.

3.1.2 Submissions

At the time research for this thesis was being conducted, there was an Australian Government Inquiry (Senate Inquiry) into mine rehabilitation and the topic of C&M was raised in submissions to the inquiry. This presented a useful data set to review different perspectives on the issue of C&M and to identify if C&M is seen as a problem and what that problem might be. All 93 submissions made to the Committee were reviewed including 56 submissions made to the committee by groups and 37 submissions made by individuals.

Of the 93 submission 28 mentioned C&M, these 28 submissions were analysed, using key themes to better understand the context in which C&M was discussed. This analysis was useful to identify which groups are following the issue and how they identify and present the issue of C&M. This analysis is presented in Appendix 2 and discussed in Chapter 5. The final report was released during the course of this research and so recommendations that relate to C&M were also reviewed and analysed. Again a manual coding approach was preferred because the context in which C&M was used was important and influenced how that data was analysed.
3.2 Key Informant Interviews

Semi structured interviews with regulators (from the mines and or environment departments in each state and the NT) and industry peak groups were conducted to understand how sites in C&M are regulated by government and managed by industry. A semi-structured approach was used to be able to disclose new issues raised by participants rather than restrict responses to predetermined categories or types (Neuman 2003). These two distinct groups are privy to a range of factors that impact the management and regulation of C&M sites. They were purposively selected based on experience and detailed understanding about sites, risks, management problems, regulatory tools and corporate behaviour. This aspect of the thesis was conducted with University Human Research Ethics approval (2018/110) and Field Work Safety approval (RAMP01067_05_18)\textsuperscript{11}.

The interview questions were designed to initiate a conversation and with a series of other questions designed to draw out details of how C&M sites are regulated or managed (see Appendix 3). Other prompts and supplementary questions were asked that were not designed but were sparked by the participants response. The list of questions to government and industry are detailed below with an explanation about the purpose of each question.

Industry and government could be considered elite groups, elite through access to privileged information, through power or wealth. Slote Morris (2009) describes the challenges of interviewing elites, or people with power, suggesting that ‘polite interviews’ are likely to present information that the interviewee has decided they want you to know. At the same time being a cynical interviewer or being selective could be manipulative. Morris suggests that to overcome these challenges the interviewer tries to adopt a collaborative approach that “may provide a positive way through the difficulties of subjective methodology” (Slote Morris 2009). This helped frame the questions (see 3.2.1).

The aim of conducting interviews with government was to understand what policy tools regulators use to manage the risks of mines in C&M. The aim of the interviews with industry representatives was to understand what factors contribute to how companies make decisions.

\textsuperscript{11} See Appendix 6A & 6B.
around C&M and what risk factors they consider. Many of the responses were related to direct experience at sites and in some cases provided new topics that had not been identified in literature. Other responses expanded on topics identified in the literature and discredited or validated other topics.

Other stakeholders and interest groups were not interviewed as the research focus was on understanding the specific process of regulation and managing C&M sites. The review of submissions to the Senate Inquiry disclosed a diversity of views many from environment groups. Workers (as opposed to executives or industry representatives) and traditional owners or local community members may also have useful insights about the realities of day to day management. However, the focus of this study has been to understand C&M as a policy problem across all states of Australia and the NT making local engagement with impacted communities beyond the scope of the research.

Interviews across all states and the NT were preferred over cases studies because each individual mine site operates under a unique set of variables. For example, the size of company and resource, the jurisdiction and its particular laws and conditions, the type of commodity and the factors influencing the commodity price over time. It would require a large sample of case studies to be able to draw conclusions and it is unlikely that this approach would identify enough data about policy tools and responses to help understand the policy problem of how sites in C&M are regulated and managed across the states and NT. The question of understanding the policy problem of C&M requires a qualitative approach which can draw out the nuances of the problem and the opportunity to explore responses with participants.

3.2.1 Questions to Government

- When a company makes a decision to place a mine in C&M what then is your Departments role or how does the Department respond?
  - What kind of risk factors do you look out for and how do you manage or regulate those?
  - From a regulatory perspective, are there benefits from mines being in C&M?
What happens when a mine goes out of C&M - what kind of pathways or options are there?

The set of questions seeks to identify how regulations are used to manage sites in C&M. Asking about the role of department was less direct than asking how a site is regulated which was designed to avoid an interrogation type tone and to solicit a less formal response. These questions focus on the day to day management and actions in order to identify what regulators do and the range of policy tools they use as opposed to what the policies do or do not say should be happening.

The last two sub–questions regarding potential benefits of C&M and pathways out of C&M were included to help understand how regulators and companies view issues of extended C&M relating to mine closure and recommencement of mining. In many cases, a supplementary question was asked referencing the Queensland Audit report to raise the issue of mine closure avoidance and initiate some further discussion about pathways out of C&M.

- What policies are there that are specific to mines in C&M or that could be applied to mines and C&M?
  - Is there an example of where this may have happened?

This question seeks to identify the relevant legislation that regulators use that is important for the management of C&M sites and what different policy tools they have at their disposal to use to regulate sites in C&M.

- Have you noticed any changes in the prevalence of mines going into care and maintenance?
  - What factors do you think have led to that change?

The original intent behind the question was to identify if there were more mines being placed in C&M as opposed to being closed or rehabilitated, but the responses were more short term and considered trends of mines going in and out of C&M in response to commodity price changes. When this question was asked participants found it hard to answer. In some
interviews that tended to be more formal, this question was not asked as it became apparent that the answers would not facilitate understanding the policy problem of C&M.

3.2.2 Questions to Industry

• In your view what circumstances might lead to a company placing a mine in care and maintenance?
  o Is it more likely to be external factors or internal factors?

This question was designed to explore the internal thinking behind placing a mine in C&M and to explore what else might be happening internally that makes a company vulnerable to a drop in the commodity price or some other factor.

• Once a mine is in care and maintenance can you describe what might be happening day to day at the site?
  o What kind of risk factors would the care and maintenance team be looking out for?
  o What kind of benefits are there for putting mines in C&M?

This question is aimed at getting a better understanding of what industry think their responsibilities are in C&M.

• What kind of pathways are there for mines in care and maintenance, what happens after care and maintenance?
  o What is the most common outcome for these sites in your experience?

This question was designed as a problem-solving question to try a more ‘collaborative’ approach as suggested by Galletta (2013) and Slote Morris (2009). Without asking directly about mines that use C&M as a way to avoid closure and about corporate behaviour this question still leads to that issue.
• Have you noticed any changes in the prevalence of mines going into care and maintenance?
  o What factors do you think have led to that change?

This question was also asked of government, see above for rationale.

3.2.3 The Interviews

In total, there were 16 interviews made up of four industry representatives and 12 government representatives with one or more representative from each Australian state and the NT. Initially government agencies were contacted via e-mail to generic contact points. Five government agencies declined to be interviewed but deferred to other government agencies that they felt were more appropriate, this was typically environment departments deferring to mines departments. Four mining industry groups declined to be interviewed. Three interviews were arranged through ‘snowballing’ in which one participant forwarded my details to a few contacts who then got in touch with me and agreed to be interviewed. Three of the four industry interviewees were based in WA, the other one was from NSW.

Five interviews, all in WA, were conducted face to face and recorded, the rest were over the telephone and recorded. Interviews typically lasted between 40 minutes and 1 hour. While there are practical benefits to telephone interviews, like saving time, expense, and travel there are also limitations around social cues, creating a comfortable and safe environment and how long an interview can last on the telephone (Gillham 2005). In conducting the interviews over the phone, I was not aware of any barriers created around social cues. The environment over the telephone was perhaps less familiar and comfortable and interviews were on average slightly shorter than face to face interviews. The responses from the telephone interviews were perhaps more concise than responses from face to face interviews which helped limit bias or misinterpretation of the responses from participants. Re-listening to interviews to extract meaning from the responses was invaluable in identifying terminology and phrases and important nuances that were less obvious during the interviews.
3.2.4 Interview Data Analysis

All interviews were recorded with permission from participants and transcribed into a spreadsheet. Responses were time coded and given a brief description. Transcripts of interviews were sent to participants for review, only half a dozen responded with minor corrections. Responses were reviewed in two phases, the first was to consider specific policy issues which largely matched the topic of the answer given, these included; causes for C&M, regulatory practice, risk factors, regulatory reform and definitions, corporate responsibility, closure and bonds & case studies (see Appendix 4). Once the data had been collated into a form that allowed some comparison, a second phase of analysis was initiated. This review revealed new topics and the data was extracted under different headings for further analysis. These topics included: C&M as operating mines, sterilisation of resources, company size, defaulting, selling, bonds, regulatory options, rehabilitation, predictability and risk (see Appendix 5).

Interviews were anonymised by allocating a code to indicate which jurisdiction the interviewee was from and whether the interviewee was from industry or government. Interviews from industry were given a code A1 – A4. Government interviewees were given a code B1- B12.

Analysis by jurisdiction

To consider state and NT specific policy information key words and phrases that were specific to either policy or practice of regulating mines in C&M in the relevant jurisdiction were extracted from transcripts. Extracted data was compared with data from grey literature on policy for C&M in that specific jurisdiction (Appendix 1). Interview extracts where then considered in conjunction with existing information about policies for that jurisdiction to cross reference, either support or offer new insights into how C&M sites are regulated in each jurisdiction. Following the extraction of state and NT specific information the transcripts were then anonymised with codes to indicate whether the response was from industry or government, removing any link to state or territory.

The analysis was first done by individual jurisdiction to solidify some overall understanding about how the policy is applied in each jurisdiction, this is not included in the thesis. Rather than presenting information by jurisdiction the information is presented by regulatory tool
(Chapter 6). The process of reviewing information by jurisdiction was valuable in understanding the variation of regulatory responses to C&M in each jurisdiction and offered clarity about how individual regulatory tools are used. This was useful in analysis of individual policy tools, outlined in Chapter 6.

A review of each jurisdiction is presented in Chapter 4. This review does not look at individual policy tools but overall policy approach to mine closure. This is summarised in tables by jurisdiction and followed by a summary of the regulatory framework and description of policy discussions on mine closure issues. This information and review by jurisdiction was more valuable and insightful than considering the interview data on the application of individual policy tools by each jurisdiction.

**Analysis of common C&M policy issues**

To consider underlying issues that impact how mines in C&M are regulated (Chapter 6), interview extracts were considered by topic (Appendix 4). Cataloguing responses and reviewing them by topic helped identify common issues or discussion points (Appendix 5). The interview extracts revealed important underlying tensions, issues and views about the barriers to mine closure, the objectives of regulators, and the reality of how companies behave or operate in a risky and volatile sector. This analysis was hard and complex but made possible by organising data in different ways to compare responses from interviewees with new questions and topics in mind.
Chapter 4: The regulation of mining and C&M

This Chapter summarises the regulatory structure for each state and the NT in Australia and comments on policy reform agendas to help understand the policy environment in which the issue of mine closure and C&M exists. Mines are predominately regulated by state and territory governments. The role of the Commonwealth government is described briefly at the beginning of the chapter to identify their role in regulating the mining sector but more importantly their role in influencing policy. Table 4.1 summarises Federal policy which impacts the mining sector.

The review of the regulatory framework for mines by jurisdictions includes Table 4.2 which summarises how each jurisdiction regulates C&M. The review of each jurisdiction begins with a table that summarises every mention of C&M in a policy document within that jurisdiction. This chapter seeks first to explain the federal government role, or lack of role in regulating C&M and then to present the existing policy for C&M by jurisdiction which includes a review of the policy debate around mine closure and demonstrates, generally, the absence of C&M within those debate.

4.1 The National Policy Environment

Due to Australia’s political structure the Australian government has little legislative power over mining however they influence and advise on mining policy and provide information and resources to the mining sector. There is federal legislation and government agencies that impact mining activities, though not specific to mining, as well as non-enforceable federal guidelines for the mining industry (Geoscience Australia 2017). Federal legislation that intersects with mining includes environment, native title\textsuperscript{12}, tax, corporations, foreign investment, trade and customs, and competition (Geoscience Australia 2017). Table 4.1 below identifies federal policy that is relevant to the mining sector and the federal government agency that administers the policy.

\textsuperscript{12} The Native Title Act 1993 – requires mining companies to negotiate with Native Title Holders – Aboriginal groups who have, through a complex court system, proven their unbroken connection to their ancestral lands. The legislation has been heavily criticised by Aboriginal groups and others (Vincent 2017; Marsh 2013).
Table 4.1: Federal legislation that applies to mines * indicates mining specific guidelines – non enforceable standards

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<thead>
<tr>
<th>Leg/reg/guidelines (* indicates non enforceable guidelines)</th>
<th>Government Agency responsible for administering – as of 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment Protection and Biodiversity Conservation Act 1999</td>
<td>Department of the Environment</td>
</tr>
<tr>
<td>Foreign Acquisitions and Takeovers Act 1975</td>
<td>Foreign Investment Review Board</td>
</tr>
<tr>
<td>Foreign Acquisitions and Takeovers Fees Impositions Act 2015</td>
<td>Australian Securities and Investments Commission</td>
</tr>
<tr>
<td>Native Title Act 1994</td>
<td>Attorney General’s Department</td>
</tr>
<tr>
<td>Customs Tariff Act 1995</td>
<td>Department of Home Affairs</td>
</tr>
<tr>
<td>Customs Tariff (Anti-Dumping) Act 1975</td>
<td>Department of Industry, Science, Energy and Resources</td>
</tr>
<tr>
<td>Customs Act 1901</td>
<td>Department of Home Affairs &amp; Department of Industry, Innovation and Science</td>
</tr>
<tr>
<td>Foreign Corporations (Application of Laws) Act 1989</td>
<td>Department of Industry, Science, Energy and Resources</td>
</tr>
<tr>
<td>Customs (Prohibited Export) Regulations 1958</td>
<td>Department of Home Affairs</td>
</tr>
<tr>
<td>Lands Acquisition Act 1989</td>
<td>Department of Finance</td>
</tr>
<tr>
<td>Defence Force Regulations 1952</td>
<td>Department of Defence (mining on defence lands)</td>
</tr>
<tr>
<td>Woomera Prohibited Rule 2014</td>
<td>Department of Home Affairs</td>
</tr>
<tr>
<td>Work Health and Safety Act 2011</td>
<td>Comcare</td>
</tr>
<tr>
<td>Atomic Energy Act 1953</td>
<td>Department of Industry, Science, Energy and Resources</td>
</tr>
<tr>
<td>Australian Nuclear Science and Technology Organisation Act 1987</td>
<td>Department of Industry, Science, Energy and Resources</td>
</tr>
<tr>
<td>Coal Industry Repeal Act 2001</td>
<td>Department of Industry, Science, Energy and Resources</td>
</tr>
<tr>
<td>Coal Research Assistance Act 1977</td>
<td>Department of Industry, Science, Energy and Resources</td>
</tr>
<tr>
<td>National Radioactive Waste Management Act 2012</td>
<td>Department of Industry, Science, Energy and Resources</td>
</tr>
</tbody>
</table>

* Leading Practice Sustainable Development Program (LPSDP)
5. Community Health and Safety Handbook
7. Energy Management in Mining Handbook
10. Preventing Acid and Metalferous Drainage Handbook
15. Tailings Management Handbook
17. Working With Indigenous Communities Handbook

* National Mine Safety Framework

Developed by Department of Industry, Tourism and Resources (now Department of Industry, Science, Energy and Resources) in partnership with the Department of Foreign Affairs and Trade.
The Australian government’s role in regulating the environmental impacts of the mining sector have been reduced, under the Environmental Protection and Biodiversity Conservation Act 1999 bilateral agreements on environmental assessments with the State and Territory governments. The current Government seeks a further reduction in the federal government’s role in environmental approvals while the ALP, Australian Greens and environmental NGOs seek stronger and new environmental laws nationally. There is a clear political divide on the role of the federal government in environmental protection with implications for the regulation of mining activities.

The Australian Department of Industry, Science, Energy and Resources (DISER)\(^{13}\) provides funding and incentives for mining. They also regulate exports and have a more direct regulatory role for some mines like the Ranger uranium mine in the Northern Territory which is regulated under the Australian Atomic Energy Act 1953. Within DISER there is a Resources Policy Group (RPG) which identifies and responds to issues affecting the onshore resources sector. The RPG operates in conjunction with state and territory governments through the Council of Australian Governments (COAG) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO), where state and territory governments discuss new policy directions for the resource sector. The aims and objectives of the RPG and broader deregulation and development agenda within the DISER are largely consistent with the globalisation paradigm with a focus on increasing Australia’s competitiveness to attract international investment (DIIS 2019).

A second federal department Geoscience Australia provides data on minerals and energy potential in order to encourage investment in exploration. Both Geoscience Australia and DISER are established to support and promote the mining sector and work with industry to

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\(^{13}\) Australian and state/territory government agencies frequently change names. The Department of Industry Science Energy and Resources was recently called the Department of Industry Innovation and Science (2015- 2019) before DIIS it was called the Department of Industry and Science (2014-2015), before that the Department of Industry (2013-2014) before that the Department of Resources, Energy and Tourism (2007-2013) and before that the Department of Industry Tourism and Resources (2001-2007).
develop self-regulation. The play an important role in policy discussions and driving the policy agenda but have a minimal role in regulation or the active management of mines.

The Commonwealth Corporations Act 2001 is administered by the Australian Securities and Investment Commission (ASIC). In the Discussion Paper - Achieving improved rehabilitation for Queensland (Queensland. Treasury et al. 2018, p. 12) identifies section 50AA of Corporations Act 2001 as relevant to issues relating to mines in C&M. Section 50AA defines control in reference to the controlling interest in a company and is relevant to where there is a change in the controlling interest in a mining company. It’s suggested that there be “change of control assessments” (CCA) in Queensland which would give the government power to assess the financial and technical capabilities of an entity that is seeking to take a controlling interest of a mining company (Queensland. Treasury et al. 2018, p. 14), this is reviewed in Chapter 7.5.4.

The federal government may not have mining specific legislation however through national environmental, corporation, tax, native title and trade laws there are many relevant national policies that impact mine projects. The federal government also plays a significant role in promoting the industry and working with the state and territory governments on a range of areas that support mining including setting the agenda and developing state and territory policy and non-enforceable industry standards. The government appears more concerned with the competitiveness of Australia’s mining sector and managing the image of the mining sector than the more mundane and contentious task of regulating and ensuring compliance.
### 4.2 State Government

**Table 4.2: State and Territory summary of policy framework for C&M**

<table>
<thead>
<tr>
<th>Bonds/ levy/ fund/</th>
<th>NSW</th>
<th>NT</th>
<th>Qld</th>
<th>SA</th>
<th>Tas</th>
<th>Vic</th>
<th>WA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonds/ levy/ fund/</td>
<td>100% bond</td>
<td>100% bond + levy</td>
<td>Either a fee or a bond or both are required.</td>
<td>Bonds are required</td>
<td>Bonds are required</td>
<td>Bonds are required</td>
<td>An annual levy of 1% of the calculated mine closure cost. Bonds can be required but are not in most cases.</td>
</tr>
</tbody>
</table>

**Definition**

<table>
<thead>
<tr>
<th>NSW</th>
<th>NT</th>
<th>Qld</th>
<th>SA</th>
<th>Tas</th>
<th>Vic</th>
<th>WA</th>
</tr>
</thead>
<tbody>
<tr>
<td>No clear definition - found in Audit Report and Guidelines say C&amp;M triggers an updated MOP</td>
<td>No clear definition but is found in three pieces of legislation – one to include C&amp;M as a ‘mining activity’ the other 2 in reference to specific mine sites one is a set of guidelines specific to C&amp;M but still does not have a clear definition</td>
<td>No clear definition – found in Audit Report and policy discussion</td>
<td>No clear definition, but C&amp;M is listed on their database as status of mining and clearly identify mines in C&amp;M</td>
<td>No clear definition. But is appears as an ‘operational status’ selection option on the Mineral Deposit Search tool on the Mineral Resource Tasmania website.</td>
<td>No clear definition, but C&amp;M is defined in the WA Guidelines for Preparing Mine Closure Plans May 2015.</td>
<td></td>
</tr>
</tbody>
</table>

**Land Tenure / Corporate risk**

<table>
<thead>
<tr>
<th>NSW</th>
<th>NT</th>
<th>Qld</th>
<th>SA</th>
<th>Tas</th>
<th>Vic</th>
<th>WA</th>
</tr>
</thead>
<tbody>
<tr>
<td>When a mining license is transferred/sold – the capacity of the company can be assessed and requires Ministerial approval</td>
<td>Unclear</td>
<td>the Department of Energy can annually assess the risk of an Environmental Authority and its holder.</td>
<td>Unclear</td>
<td>Technical and financial capacity in considered when granting a mining lease</td>
<td>Unclear</td>
<td>Project/companies are given a risk assessment – high risk sites where there have been issues get more regular inspections etc.</td>
</tr>
</tbody>
</table>

**Mine Plans (and or Mine Closure Plans, C&M Plans) and Operating conditions**

<table>
<thead>
<tr>
<th>NSW</th>
<th>NT</th>
<th>Qld</th>
<th>SA</th>
<th>Tas</th>
<th>Vic</th>
<th>WA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining Operation Plan/ rehabilitation requirements and bond – C&amp;M triggers a new or revised MOP for approval</td>
<td>Mining Management Plans (MMP) - Mining Management Act 2001. There are specific guidelines requiring a C&amp;M Plan.</td>
<td>Progressive Rehabilitation and Closure (PRC) plans are required</td>
<td>All Mineral leases require a Program for Environmental Protection and Rehabilitation (PEPR). Private mines have a Mining Operations Plan (MOP) and very old mines have a Development Consent (DC)</td>
<td>A Mine Plan is required. Decommissioning &amp; Rehabilitation Plan should show provisions for unplanned and temporary closure as part of the DRP. C&amp;M plans are required as part of conditions or through an environmental protection notice.</td>
<td>Work Plan – includes rehabilitation planning</td>
<td>Mine Closure Plans (MCP) are required as part of a Mine Plan. A C&amp;M plan is required within three months of notifying the district mines inspectorate</td>
</tr>
</tbody>
</table>

**Notification**

<table>
<thead>
<tr>
<th>NSW</th>
<th>NT</th>
<th>Qld</th>
<th>SA</th>
<th>Tas</th>
<th>Vic</th>
<th>WA</th>
</tr>
</thead>
<tbody>
<tr>
<td>A mine cannot suspend operations without Ministerial consent</td>
<td>NA</td>
<td>there are requirements to notify when production at a mine has ceased for more than 6 months.</td>
<td>NA</td>
<td>A company must notify the Chief Inspector of mines before mining operations are ‘suspended’.</td>
<td>NA</td>
<td>A company must notify the district mines inspector when mining has been ‘suspended’</td>
</tr>
</tbody>
</table>

**Time restrictions**

<table>
<thead>
<tr>
<th>NSW</th>
<th>NT</th>
<th>Qld</th>
<th>SA</th>
<th>Tas</th>
<th>Vic</th>
<th>WA</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOPs approved for a C&amp;M period tend to be approved for a 2-3 year period (extensions can be granted). The mining act says suspension of mine operations cannot be more than 3 months.</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>2-year limit, but extensions can be granted. (unclear where this requirement is in policy)</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>
4.2.1 New South Wales

<table>
<thead>
<tr>
<th>Legislation/ Regulation/ Guideline</th>
<th>Content relating to C&amp;M</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESG3: Mining Operations Plan (MOP) Guidelines, September 2013 (ESG3)</td>
<td>“Types of changes that would typically require a new MOP include: The mine is placed into care and maintenance; or premature or unplanned closure.”</td>
</tr>
<tr>
<td>Mining Act 1992 No 29</td>
<td>“70] Conditions of mining lease (1) A mining lease is subject to: (a) a condition that the holder of the lease will not suspend mining operations in the mining area otherwise than in accordance with the written consent of the Minister”</td>
</tr>
<tr>
<td></td>
<td>“100) Conditions of consolidated mining lease A consolidated mining lease is subject to: (a) a condition that the holder of the lease will not suspend mining operations in the mining area otherwise than in accordance with the written consent of the Minister”</td>
</tr>
<tr>
<td></td>
<td>“215] (4) 4) A condition of a mineral claim that is suspended on the application of the holder of the claim may not be suspended for more than 3 months at a time.”</td>
</tr>
</tbody>
</table>

In New South Wales mines are predominantly regulated by the ‘Resource Regulator’ within the Department of Resources and Energy (DRE) which is part of the Department of Planning and Environment (DPE) under the Mining Act 1992. Mines also require a ‘development consent’ under the Environmental Planning and Assessment Act 1979. Smaller mines acquire a ‘development consent’ from local council whereas ‘State Significant’ mines require approval by the Minister for Resources. Some mines also require approval by the Environmental Protection Authority (EPA) under the Protection of the Environment Operations Act 1997.

The 2017 Audit Report (NSW. Audit Office 2017) highlighted that there is a problem with the potential to hold mines in C&M indefinitely. It was also identified that the bonds currently held by the NSW government do not meet the expected liability of mine closure. In response to the 2017 Audit Report the Department of Planning and Environment released a discussion paper on improving mine rehabilitation (NSW. DPE 2017). The discussion paper frames the mining industry as a big contributor to the economy, outlines existing requirements and importance of a ‘rehabilitation security deposit’ otherwise known as a bond.

The discussion paper frames mine closure as a policy problem with a focus on ‘final voids’, insufficient bonds and the indefinite period that a mine can be held in C&M. C&M is raised as a

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14 State significant mines include coal, mineral sands, mines that require over $30 million capital investment (NSW Resource Regulator 2019)
15 ‘Final voids’ areas where excavation occurred – open pits, underground tunnels etc.
post closure issue which is inconsistent with the findings of the Audit Report. The discussion paper suggests that “action is underway”... on “developing new requirements for mines in care and maintenance” though there is no clear indication of what those requirements are or how they will improve outcomes and there is no clear articulation of C&M as a policy problem (NSW. DPE 2017). The Discussion Paper is listed as a being a “Draft Plan or Policy” and as being under consideration (NSW. DPE 2017). This suggests there is scope for improved regulation, though it’s unclear exactly what the proposed reform is and what the process is for the policy reform.

4.2.2 Northern Territory

<table>
<thead>
<tr>
<th>Legislation/ Regulation/ Guideline</th>
<th>Content relating to C&amp;M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining Management Act 2015</td>
<td>“mining activity means any of the following activities: (f) operations for the care and maintenance of a mining site when an activity referred to in another paragraph of this definition, except paragraph e, is suspended.”</td>
</tr>
<tr>
<td>McArthur River Project Agreement Ratification Act 1992</td>
<td>“Services means the services of engineers, surveyors, architects and other professional consultants, experts and specialists, project managers, manufacturers, wholesalers, retailers, suppliers and Contractors and includes any other services necessary or incidental to the construction, continued operation or care and maintenance of the McArthur River Project.”</td>
</tr>
<tr>
<td>McArthur River Project Agreement Ratification Act 1992</td>
<td>“For the purposes of this provision, “abandons” shall include placing the McArthur River Project on a care and maintenance basis for a period of more than one year or a number of periods which total more than one year, provided that the Minister may in writing in his discretion extend that period of one year;”</td>
</tr>
<tr>
<td>Merlin Project Agreement Ratification Act 2016</td>
<td>“subject to clause 14 abandons the Merlin Project and does not resume operations on the Merlin Project and for the purposes of this provision, abandons shall include placing the Merlin Project on a care and maintenance basis for a period of more than three (3) years or a number of periods which total more than three (3) years, provided that the Territory may in writing at its discretion extend that period of three (3) years; or”</td>
</tr>
<tr>
<td>Merlin Project Agreement Ratification Act 2016</td>
<td>Services means the services of engineers, surveyors, architects and other professional consultants, experts and specialists, project managers, manufacturers, wholesalers, retailers, suppliers and Contractors and includes any other service necessary or incidental to the construction, continued operation or care and maintenance of the Merlin Project</td>
</tr>
<tr>
<td>Mining Management Plan Structure Guide for Care and Maintenance Operations 2017</td>
<td>A detailed “Advisory Note” for the preparation of Care and Maintenance Plans, required within 3 months of placing a mine in C&amp;M. It describes when a revised Mining Management Plan is required and what aspects of a project need to be considered in the plan. It does not define C&amp;M.</td>
</tr>
</tbody>
</table>

The NT is the only jurisdiction with guidelines specific to C&M. DPIR developed C&M Plan guidelines in 2017 following a reform process for mine rehabilitation. The guidelines outline the information required within a Mine Management Plan for an operation entering C&M, however they do not specify a comprehensive set of regulations or guidelines for the operation of a C&M mine. C&M has not been clearly identified by the NT government as a policy problem. With the establishment of the MMA (2013) there is no clear proposal for further regulatory changes specific to C&M and no clear discussions identifying C&M as a policy problem. With an evaluation of the effectiveness of the MMA it may become apparent that C&M is a policy problem.

### 4.2.3 Queensland

**Table 4.2.3: Queensland summary of C&M mentions in policy documents**

<table>
<thead>
<tr>
<th>Legislation/ Regulation/ Guideline</th>
<th>Content relating to C&amp;M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral Resources Act 1989</td>
<td>“334J Access rights for particular activities (5) During the moratorium period, the holder of an oil shale mining tenement for the land may— (c) enter the area to do all or any of the following—(iii) carry out care and maintenance of disturbed areas;”</td>
</tr>
</tbody>
</table>

The Department of Natural Resources Mines and Energy (DNRME) who grant Resource Authorities (RA) predominantly regulate mines in Queensland. The Department of Environment and Science (DES) assesses and regulates environmental aspects of mines and grants Environmental Authorities (EA). Small mines that do not require an EA are still required to engage with the DES over rehabilitation requirements and financial provisions under the Mineral Energy (Financial Provisioning) Act 2018. These requirements apply to all mines. The Department of Treasury is also involved in the management of Financial Provisions under the Act in determining a level of risk for an EA.

The Queensland Government has documented that “170 medium, large and giant coal and minerals (base and precious metals) operations are in C&M” (Queensland. Treasury et al. 2018). They have also identified that “Currently, the State has 220,000 hectares of disturbance, with an estimated rehabilitation cost of $8.7 billion (Queensland. Treasury et al.
Queensland is active in both acknowledging C&M as a policy problem and in developing new practices to address the policy gaps in response to the Office of the Auditor General clearly articulating the problem.

The link between C&M and abandonment in Queensland was documented in the 2013-2014 QLD Audit Office Environmental Regulation of the Resources and Waste Industries Report. The 2014 Report identified that while C&M has a legitimate use, some companies use C&M as a way of avoiding rehabilitation and that there is a lack of definition and protocols for C&M (Queensland. Audit Office 2014).

A cause of unsuccessful rehabilitation is the inability of the operators to meet the rehabilitation requirements which, in some cases, may be unachievable. This means some sites go into care and maintenance and a few operators forfeit the financial assurance to the state. As the financial assurance is often insufficient to cover the estimates cost of site rehabilitation, the state is left with an increasing legacy of sites that are not rehabilitated. There are a number of reasons why a mine might go into care and maintenance, such as changes in world commodity prices. It can also be used as a means of avoiding rehabilitation. There is no clear definition of care and maintenance sites and there is a lack of protocols between EHP and NRM about the management of these sites. This results in sites remaining in care and maintenance while the departments dispute over the administrative and regulatory responsibility for the site (Queensland. Audit Office 2014, p.3).

The Queensland Auditor General released a follow up report on mine rehabilitation issues in 2017, which found that problems with C&M are linked to a lack of definition, process or guidelines, lack of complete records and a lack of oversight and monitoring (Queensland. Audit Office 2017). The report makes recommendations that there be a defined set of formal protocols on the management of sites once in C&M and explains that the Department of Environment has a plan to record C&M information in a ’Compliance and Risk Evaluation’ tool. The ‘financial provisioning’ changes in the Mineral Energy (Financial Provisioning) Act 2018 do not address the range of issues identified with C&M by the Auditor General. There are other
reform ideas, including those by the Auditor General that are actively being discussed and considered (Queensland. Treasury et al 2019).

4.2.4 South Australia

Table 4.2.4: SA summary of C&M mentions in policy documents

<table>
<thead>
<tr>
<th>Legislation/ Regulation/ Guideline</th>
<th>Content relating to C&amp;M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Health and Safety Regulations 2012</td>
<td>“633—Closure, suspension or abandonment of mine (2) If mining operations at a mine are suspended, the mine operator must ensure, so far as is reasonably practicable, that the mine is safe, including by being secure against unauthorised entry by any person, during the period of suspension. Maximum penalty: (a) in the case of an individual—$6 000; (b) in the case of a body corporate—$30 000.”</td>
</tr>
<tr>
<td>Mining Act 1971</td>
<td>(5) If royalty payable on minerals recovered from a private mine is not paid on or by the day on which it fell due— (a) the Minister may, by written notice served on—(3)—the person carrying out mining operations at the private mine, make an order suspending mining operations at the mine; and</td>
</tr>
</tbody>
</table>

In South Australia there are slightly different regulations for mineral mines (e.g. Coal, uranium, gold, nickel, iron etc.) and extractives mines (slate, clay, gravel, sand, limestone etc.) and Opal Mining. The Department of Energy and Mining (DEM) is the primary regulator for all mines and the Department of Environment and Water (DEW) provide advice to the DEM on environmental or heritage aspects of mines. DEW also grant licenses or permits for water or native vegetation clearing and engages in monitoring and compliance. The SA EPA, as a prescribed body under the Development Act 1993, determines the level of assessment a mining ‘development application’ requires. The EPA assesses some projects with regard to environmental and human impacts and gives recommendations on whether or not to approve a project and under what conditions.

In 2018 changes to the Mining Act were proposed but specific measures to regulate mines in C&M were not included, sidelining C&M as a policy issue. Proposed changes strengthen some Ministerial powers in relation to bonds and the establishment of a Mining Rehabilitation Fund (MRF) is also proposed. The fund would be derived from fines or expiation fees and would be used “to fund monitoring and maintenance programs relating to rehabilitation of any land, achieve environmental outcomes related to the ceasing of authorised operations” (South Australia. DEM 2018, p. 32). The Minister could also issue orders requiring a company to rehabilitate at any time, breaching an order would cost a company $120,000 (DEM 2018, p.
This amount is likely to be much less than the cost of closure and so it is unlikely to prevent the use of C&M to avoid rehabilitation.

### 4.2.5 Tasmania

<table>
<thead>
<tr>
<th>Table 4.2.5: Tasmania summary of C&amp;M mentions in policy documents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Decommissioning &amp; Rehabilitation Plan (DRP) Guidelines</strong></td>
</tr>
<tr>
<td>“The Decommissioning &amp; Rehabilitation Plan (DRP) should show provision for Planned Closure, Sudden Closure and Temporary Closure”</td>
</tr>
<tr>
<td><strong>Mineral Resources Development Act 1995</strong></td>
</tr>
<tr>
<td>“140 Appeals (5) A notice of appeal does not operate as a stay of proceedings before the Mining Tribunal but the Supreme Court, on the application of any party, may make an order in respect of – (b) the suspension of mining.”</td>
</tr>
<tr>
<td><strong>Mines Work Health and Safety (Supplementary Requirements) Act 2012</strong></td>
</tr>
<tr>
<td>“2) If a person is appointed under sub regulation (1), the mine operator must ensure that the person has sufficient authority and control over the underground mining operations to close, or suspend operations at, the mine or parts of the mine at which workers may be exposed to an unreasonable risk to health or safety.”</td>
</tr>
<tr>
<td><strong>Mines Work Health and Safety (Supplementary Requirements) Act 2012</strong></td>
</tr>
<tr>
<td>“27. Notification of commencement of operations (1) The operator of a mine must notify the Chief Inspector of Mines before (b) mining operations are resumed after their suspension; and (d) mining operations are suspended.”</td>
</tr>
</tbody>
</table>

The Tasmanian Environmental Protection Authority (EPA) is the primary regulator for mine closure, rehabilitation and environmental aspects of mining, they also assess Environmental Impact Assessments and can require C&M plans. Mineral Resources Tasmania (MRT) is the government department responsible for mining, they administer tenure and mine plans, consider technical and financial capacity of companies to fulfil all their obligations and set and manage bonds either as cash or bank guarantees. MRT is also responsible for managing legacy mines and the Rehabilitation Trust Fund which has been established to rehabilitate or manage the pollution issues at some of Tasmania’s worst abandoned mines.

The Tasmanian Minister for Resources submission to the Commonwealth Senate inquiry, states that there are requirements for C&M plans and dismisses concerns that C&M may be used as a way of avoiding rehabilitation, “there is no implication that any mines in Tasmania are entering care and maintenance as a means of avoiding their rehabilitation obligations” (Tasmania. Minister for Resources 2017, p. 3). The tone of the Minister’s submission to the Commonwealth suggests that the government does not see that there is a problem with C&M sites. It was a Tasmanian Liberal Senator on the Commonwealth Senate Committee investigating mine rehabilitation who expressed the view that rehabilitation is and should
remain a state responsibility. In Tasmania C&M is actively sidelined as a policy issue by rejecting any notion that there is a problem with C&M and avoiding mine closure.

4.2.6 Victoria

<table>
<thead>
<tr>
<th>Legislation/ Regulation/ Guideline</th>
<th>Content relating to C&amp;M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral Resources (Sustainable Development) (Mineral Industries) Regulations 2013 - Regulation 35 Annual Activity and Expenditure Return</td>
<td>In the &quot;Annual Activity and Expenditure Return&quot; form required under the “Mineral Resources (Sustainable Development) (Mineral Industries) Regulations 2013 - Regulation 35 - Question 12.1” about the number of tailings dams in various states. Care and maintenance is given as a status option. There is no other reference to care and maintenance in this form.</td>
</tr>
<tr>
<td>Statutory reporting for the mining industry. (Schedule 16: section 6.1)</td>
<td>A description of C&amp;M relating specifically to tailings for reporting requirements “care and maintenance refers to tailings dams into which no tailings material has been added during the reporting period, but where rehabilitation works have not yet commenced as the tailings dams may be utilised for tailings storage purposes again in the future.”</td>
</tr>
</tbody>
</table>

Earth Resources Victoria is the lead regulator for mines, they assess and manage ‘Work Plans’ which act like mine closure plans. The Victorian EPA is responsible for assessing ‘Works Approval’ applications which consider water, air emissions, noise emissions, greenhouse gas emissions and general impact to land and groundwater (EPA 2017, p. 58).

The core regulations for mining in Victoria are the Mineral Resources (Sustainable Development) (Mineral Industries) Regulations which expired in 2019. At the end of 2018 draft amendments were put forward for public consultation followed by a Regulatory Impact Statement in 2019. The reforms are based on a report “Getting the groundwork right” (the Report) was compiled by the Commissioner for Better Regulation (2017). In the draft amendments there is a single reference to bonds and many mentions of mine rehabilitation and planning for rehabilitation as part of any Work Plan. None of these documents mention C&M.

The Report identifies a “regulatory ‘gap’ in relation to post-closure management, monitoring and maintenance” (Victoria. Commissioner for Better Regulation 2017) which is not clearly related to pre closure issues like C&M where companies may be avoiding rehabilitation. Despite this detailed reform agenda for the mining sector in Victoria, C&M has not been identified and has been sidelined as a policy issue.
### 4.2.7 Western Australia

#### Table 4.2.7: WA summary of C&M mentions in policy documents

<table>
<thead>
<tr>
<th>Legislation/ Regulation/ Guideline</th>
<th>Content relating to C&amp;M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care and Maintenance. Environmental Notes on Mining, updated September 2009</td>
<td>An entire document that defines C&amp;M and outlines risks and remedies.</td>
</tr>
<tr>
<td>Guidelines for Preparing Mine Closure Plans May 2015</td>
<td>Requires a C&amp;M plan within 3 months of notifying the Department, advises a company seek advice from the mines department and environment department to understand the requirements. Requires that a mine closure plan should include consideration of premature closure be given in. Refers to template docs for commencement, suspension, recommencement and abandonment.</td>
</tr>
<tr>
<td>Mines Safety Inspection Act 1994</td>
<td>Requirements to notify district inspector of mines where a mine has been suspended.</td>
</tr>
<tr>
<td>Notification of suspension of mining operation – template</td>
<td>Asks for the following: “the reason for suspension, estimated length of time to be suspended, provisions for regular and emergency service, measures to stop unauthorised access, precautions to protect undergrounds equipment and service installations, plans required under section 88 of the Act” (3.5.1 Department Code of Practice.)</td>
</tr>
<tr>
<td>Mining Act 1978</td>
<td>134. Powers of warden’s court (1) A warden’s court has power to make orders on all matters within its jurisdiction, for —(j) the cessation or suspension by any party of any mining operations or works in connection therewith causing or likely to cause, injury to any other party, (f) the cessation or suspension at any time and from time to time of any mining operations or works, or the carrying on thereof under the direction or control of some person appointed by the warden’s court, for such period as seems necessary to the court;</td>
</tr>
<tr>
<td>Mines Safety and Inspection Act 1994</td>
<td>Includes C&amp;M within the definition of a mining operation. Requires the district inspector be notified of suspension of mining before the suspension (section 42); section 42 (2)(1) requires evidence that obligations under the Act regarding the suspension have been complied with. The Act required the district inspector to inspect the mine and verify the evidence and make a record. Section 88 required the principle employer/receiver/manager to ‘be prepared’ through accurate plans to the satisfaction of the district inspector and state mining engineer in accordance with the regulations. Section 89 requires records be kept for a period of 6 years from a mine being abandoned or suspended. Section 104(1)(1)(zm) gives the Governor powers to make regulations to achieve the objects of the Act during or before a period of suspension. The Mines Safety and Inspection Regulations 1995 section 3.12 give further information on what details should be included in a notification – e.g. Date of suspension, reason for suspension, what mining operations will be affected.</td>
</tr>
</tbody>
</table>

The Department of Mines Industry Regulation and Safety (DMIRS) is the ‘lead agency’ for mining in WA and is responsible for managing tenure of mines, assessing Mine Plans and Mine Rehabilitation Plans. DMIRS also administers the Mining Rehabilitation Fund (MRF) and advises the Minister on whether or not to require a bond. The WA Environmental Protection Authority (WA EPA) decides whether or not to assess individual mine projects and the type of environmental assessment needed, it provides advice on whether a mine should be approved and under what conditions. The Department of Water and Environment Regulation (DWER) regulates environmental aspects of mines and offers advice to DMIRS.

In 2018 there was a Post Implementation Review of the MRF (Marsden & Short 2018). C&M was not mentioned but there was detailed discussion on bonds that identified that some stakeholders think bonds should have been returned more selectively and that more bonds
should be required in the future to reduce the overall risk to the government (Marsden & Short 2018 p. 35). The review concluded that the reduction in requirements for bonds created a ‘low barrier’ entry for miners and identified that the WA Government now holds $31 million in bonds (Marsden & Short 2018 p. 9). In response to suggestions of reintroducing bonds in WA, the report described that “it was acknowledged that if bonds were now sought when a company showed signs of financial distress that could ‘tip the company over the edge’. Taking this into account, some criteria for requiring bonds were suggested, such as requiring them from mines using polluting processes or from mines producing products with high levels of price volatility” (Marsden & Short 2018 p. 34 & 35). If mines in WA go into C&M without bonds any requirement to post a bond during C&M, when finances are constrained, may create a greater risk that the company will default and be forced into administration. Despite the high risk of C&M in WA, given the absence of bonds, it has been sidelined as a policy issue.

4.3 Summary

The federal government plays a small and diminishing role in the mining sector, they are however important and active in policy discussions and setting the direction of policy concerning mining. The federal government through Geoscience Australia and DIIS have defined their role in promoting mining and attracting foreign investment for mining. Their positioning and the representation of C&M and mine closure issues by the federal government are considered in greater detail in the next chapter through the review of the Commonwealth Senate Inquiry into the ‘Rehabilitation of Mining and Resources Projects as it Relates to Commonwealth Responsibilities’.

Across the states and the NT the regulatory framework for C&M is scant at best. There is just one state (WA) that clearly defines what C&M is, there are two jurisdictions (WA & NT) that have clear requirements for C&M planning, though the compliance and reporting on those requirements is unclear. Restrictions on the time a mine can be in C&M are not well defined and do not relate to C&M specifically but are a feature of reviewing operational plans. The absence of clear policy, guidance or implementation for C&M demonstrates that the policy problem of C&M and the role C&M plays in avoiding mine rehabilitation is not widely understood or accepted by state and the NT government.
Among the states and the NT there is a noticeable lack of engagement on C&M. With the exception of Queensland\textsuperscript{16} who have clearly responded to the identification of C&M as a policy problem as a way of avoiding rehabilitation and Tasmania who, conversely, have argued C&M is not a problem, there is virtually no discussion on C&M as a policy issue by other jurisdictions. The absence of acknowledgement or discussion of C&M as problem by governments is consistent with the absence of policy.

\textsuperscript{16} While the NSW Auditor has identified the policy problem of C&M the government has failed to demonstrate a clear understanding of this problem in subsequent policy discussion papers.
Chapter 5: The Representation of Care and Maintenance as a Policy Problem

The representation of a policy problem, or the lack of representation, by different sectors in the community, has a large impact on what governments do or don’t do about the problem (Howlett 2011; Maddison & Dennis 2013; Bacchi 2009). Bacchi (2009) discusses the tendency in policy analysis to focus on problem solving without necessarily understanding why a problem is represented in a certain way. The way in which a problem is represented may have a preconditioned view on the cause of the problem without considering the wider structural and systemic issues that cause the problem.

For example, it is common for commodity prices to be blamed for mines going into C&M. This is a convenient and simplistic view of what drives companies to put mines into C&M. In reality, there is a complex set of variables at a mine site that drive companies to place mines in an out of C&M that may be compounded by the interest of some companies to avoid mine closure, the absence of any specific regulation for C&M and governments’ interest in avoiding mines becoming abandoned.

If underlying values in how a problem is represented are not understood the response may perpetuate the problem. Very few academics, NGOs, governments and political parties identify C&M as a policy problem. And there are those who argue that C&M is not a policy problem at all. This chapter seeks to identify how the problem of C&M is represented by different groups and the underlying values influencing those groups. The lack of representation of C&M as a problem is also important in understanding the context in which the problem has emerged and been able to persist.

In Chapter 4 we identified that state and the NT governments, with the exception of QLD, have largely sidelined C&M as a policy issues and this is reflected in a general absence of policy. This chapter reviews how C&M is represented by a range of other interest groups including federal government, industry, non-government and other organisations and university academics. This chapter is based almost entirely on submissions made to a recent Commonwealth Senate
Inquiry. The last section considers academic and think tank views this is based on academic texts and reports.

5.1 Commonwealth Senate Inquiry into Mine Rehabilitation

In 2017 the Commonwealth Senate Standing Committee on Environment and Communications began an inquiry into the ‘Rehabilitation’ of Mining and Resources Projects as it Relates to Commonwealth Responsibilities’ (Senate Inquiry) (Australia. Senate 2019). The establishment of the Senate Inquiry was instigated by the Australian Greens. A media statement by Senator Larissa Waters linked the need for the inquiry to economic challenges facing the coal industry, the risk of companies going into administration and the liability for the rehabilitation of those mines at risk (Waters 2016). A focus of the media release was the job losses from premature mine closure, the job opportunities in mine rehabilitation, the inadequacy of bonds and liability for the government, community and environment (Waters 2016).

There was one comment in opposition, from Liberal National Party (LNP) Senator James McGrath, when the inquiry was put to the Senate. Senator McGrath pointed out that mining is typically regulated by state and territory governments and that the Senate Inquiry would duplicate a process underway by the Council of Australian Governments (COAG), Energy Council to review “National Principles for Managing Rehabilitation Financial Risks” (Australia. Senate 2017; COAG 2018). COAG released a one-page report on managing mine rehabilitation financial risks in 2018 which, without public consultation or engagement, identified seven principles for rehabilitation which are not unlike existing principles in state and federal policies.

The Committee called for submissions and held public hearings across the country drawing out a range of views on mine closure. The Senate released their final report in March 2019. The submissions to the committee, which are all publicly available, are informative about how the

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17 The inquiry uses the word ‘rehabilitation’, as mentioned in Chapter 1 the terms rehabilitation and mine closure are often used interchangeably. In this section the word rehabilitation is used but I suggest it be taken to mean mine closure which includes both rehabilitation and decommissioning.

18 1) responsibility for closure obligations rests with the tenement holder, 2) closure plans should be established before mining 3) financial assurances should be held by the state/territory government 4) assurances should be reviewed and adjusted to reflect current costs 5) monitoring should be in place to identify risk of inability to meet closure obligations 6) mechanism to monitor and apply financial assurances 7) progressive rehabilitation should be incentivised.
The topic of C&M is represented by different interest groups and individuals. Some of the submissions are reviewed in greater detail in the sections below to demonstrate the policy agenda of different groups. A summary of the findings is provided here.

Of the 93 submissions to the Senate Inquiry 28 mentioned C&M. Of the 56 submissions made by groups 18 mentioned C&M and out of the 37 submissions made by individuals 10 mentioned C&M (see Appendix 2). Of the submissions that mention C&M, ten were from environment groups, ten were individuals, two submissions were from state governments, two were from mining industry groups, there was one each from a union, country women’s group, university and a think tank. Out of the ten environment groups: six were national, one was a state peak group and the other three were local groups. The review of submissions is only representative of people and groups who are highly engaged on the issue of mine rehabilitation. These findings are unlikely to translate to the wider community.

Of the 28 submissions that raised the issue of C&M:

- 19 raised C&M as a problem: nine were from individuals; eight were from environment groups; the other two were from a university and a local branch of the Country Women’s Association.
- 18 of the submissions referred to C&M as it relates to mine rehabilitation – out of those submissions 17 framed C&M as problematic for rehabilitation.
- Ten submissions mention at least one specific site – five simply describe a C&M situation; the other five identify problems with those specific sites.
- Seven submissions identify that there is no time limit for how long a mine can be in C&M and six of those describe that as a problem.
- Five submissions advocate for specific regulatory fixes for C&M – four advocate for a time restriction on C&M.
- 12 of the submissions discuss the problem of companies selling sites in C&M, going bankrupt or going into receivership/administration/liquidation.
- Six link C&M to bonds or financial assurances, five say bonds are inadequate or there is need for adequate bonds and one says financial assurances are sufficient and they protect against risks of C&M sites being abandoned.
Two submissions, one government and one industry, defend the status of C&M and refute claims that C&M may be used as a way of avoiding rehabilitation.

It is significant that less than half of the groups who made submissions, who are highly engaged on the issue of mine closure, raised C&M as an issue. This could suggest that those groups that did not raise C&M are either not aware of C&M or do not link it to issues of mine rehabilitation. They may not see it as a problem or thought it was outside the scope of the inquiry. It may be that there are much more obvious issues around mine abandonment which detract from other related policy issues.

The scarce discussion on C&M indicates that C&M is not widely understood as a policy issue, at least not to the same degree as mine rehabilitation and is not widely understood to be related to issues of mine rehabilitation. It suggests that there is little pressure for government to address any policy shortfall in the regulation of mines in C&M. It highlights the difficult nature of the lack of representation of the policy problem which explains, to some extent, why the problem has been able to persist.

The submissions show a divide in views, with industry and some government responses clearly defending the legitimacy of C&M and disputing the notion that there is a policy problem and need for reform. Environment groups and a few other groups and individuals highlight examples of where C&M may be misused and specific problems with how policy is applied to manage C&M sites, they also push for policy reform to address the policy problem.

The review of the 28 Senate Inquiry submissions identify that the significant common policy topics are: the ambition for mine closure and rehabilitation; time limits on C&M; the importance of bonds; the selling of mine sites in C&M; and companies going into administration. Linking C&M to mine closure is clear and consistent with other findings from academic texts and auditor reports in Queensland and NSW that suggest a larger policy failure in delivering closed mines. The idea of restricting the time a mine can be in C&M and the importance of bonds links the policy problem with potential solutions through specific policy tools. These are important for consideration of C&M as a policy problem and are discussed in more detail with data collected from interviews.
5.2 Political Party Responses

The inquiry report published in March 2019 included a number of recommendations regarding C&M made by the Australian Greens and the Australian Labor Party (ALP). The Australian Greens advocated for a national inventory of mines and restrictions on the time mines can be in C&M. The Australian Greens were of the view that national standards should be developed to ensure consistency in state and territory jurisdictions (Australia. Senate 2019). The ALP acknowledged the issue of C&M and incorporated C&M into recommendations relating to mine rehabilitation that called for consideration of rehabilitation and C&M during the 2019-2020 EPBC Act Review. This sidelines this issue to some extent as the EPBC is only relevant for projects with a Matter of National Environmental Significance (MNES).

Additional comments from the Liberal Party in the Senate Report sideline C&M as a policy issue. Accordingly, the Liberal Party reiterates the role of state and territory governments in regulating mines and mine rehabilitation (Australia. Senate 2019, p. 161-162). The Report highlights recent reform, particularly in Queensland, as an example of improvements to regulations initiated by state government further suggesting that reform or establishment of national standards should be done through COAG with agreement across all jurisdictions. They dismiss calls for incorporating mine closure regulations in the EPBC Act by noting that the Act is only relevant to MNES. They caution against additional regulation as cumbersome to an industry which generates economic wealth for the nation and that may introduce ‘sovereign risk’. 19

The Senate Report clearly identifies that there are social, environmental issues from legacy mines, and that improvements can be made, but that “(t)he committee has not, however, been able to reach agreement on a unanimous set of recommendations to guide the way forward for regulating the rehabilitation of mining and resources projects in Australia” (Australia. Senate 2019, p. 147). The position taken by the Australian Greens, the Australian Labor Party and the Liberal Party show a clear political divide in views on mine rehabilitation

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19 Sovereign Risk is the notion that changes to policy may result in lost income due to the policy change which may be the basis for legal action from the companies who have lost revenue.
and the role of the federal government in regulating the mining sector. This political divide is significant in developing a broader understanding of the policy environment in which the absence of closed mines persists, the policy problem of C&M exists and is informative about barriers and opportunities for improving regulations in this area. It also reinforces the findings from Chapter 2 that the political influence the mining sector has in Australia is significant. This is shown in the Liberal party response to the Senate Inquiry in which they argue against increased regulation given the industries importance to the economy. The response nationally downplays C&M as a policy issue.

5.3 Industry Perspectives

The industry makes a point of differentiating C&M from abandoned mines or the ‘premature closure’ of mines and explains that there are ongoing government requirements for mines in C&M (MCA 2017; Queensland Resource Council (QRC) 2018). Industry does not identify C&M as a policy problem. This emphasis from industry is to distance C&M from being associated with the problems of premature closure and abandonment (MCA 2017; QRC 2018) and to reiterate the legitimate use of C&M. Industry legitimises C&M by explaining that C&M, like any other stage of mining, requires compliance with existing laws, regulations, conditions (MCA 2017).

The ANZMEC\textsuperscript{20} & the MCA, Strategic Framework for Mine Closure (2000) clearly defines C&M and makes recommendations for the completion of rehabilitation work during C&M whether mining is to recommence at the site or not. The recommendations address the importance of rehabilitation during C&M but they do not link this to an avoidance of rehabilitation by companies. This report was published in 2000, since then the MCA have developed a more nuanced public discourse on C&M.

The MCA raised C&M in their joint submission to the Senate Inquiry on rehabilitation (MCA 2017). The MCA frame mining positively by stating that “mining activities are strictly regulated”

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\textsuperscript{20} ANZMEC was made up of the Commonwealth Minister for Industry Science and Resources, State and Territory Ministers with responsibility for minerals and energy and the New Zealand Minister for Energy. The Minister for Mining and Petroleum and Energy of Papua New Guinea had observer status. ANZMEC co-authored the Framework for Mine Closure with the industry group the Minerals Council of Australia in 2000. ANZMEC are not an industry group, the Framework provides some insight into the MCAs early positioning on C&M.
that mining contributes to jobs and local economies, and that is a “key driver of the Australian economy” (MCA 2017, p. 8). They also point to responsible mining through voluntary standards such as the Enduring Value Framework and ICMM principles for sustainable development and point to specific commitments on mine rehabilitation.

The MCA submission identifies that financial assurances and requirements for bonds are maintained even when a project is sold to a new company. The submission says, while industry “supports an appropriate mechanism to safeguard governments from incurring financial liability, it is important these mechanisms be efficient, incentivise good performance and come at least cost to industry” (MCA 2017, p. 17). The submission outlines the negative impact of bonds to industry, through high costs in maintaining bank guarantees, impacts on borrowing capacity, and tying up money that could be invested. They advocate for greater flexibility in bonds. The overarching policy agenda in this submission is that federal regulation is unnecessary as there are complex and sufficient regulations administered by the states and the NT.

Queensland Resource Council (QRC) (2018) acknowledged concerns about C&M from ‘external stakeholders’ but refute these concerns by claiming that financial provisioning mechanisms protect against abandonment. Like the MCA, the QRC describe C&M as being different to premature closure or abandonment and state that the liabilities of sites in C&M remain with the company “safe-guarded by financial assurance mechanisms.” This implies that the financial assurance mechanisms are robust enough to meet closure requirements. They point to existing legislation in Queensland, without detail, to suggest that financial risks can be managed by the government.

Gilbert and Tobin (2014) outlined what kind of considerations companies should factor in before placing an operation in C&M. The report identified a complex range of considerations including environment, employees/consultants, health and safety, shareholders, financiers and insurers, mining titles, contracts, board and other stakeholders, as aspects of a mine’s operations that need to be managed during C&M. The Gilbert and Tobin (2014) report demonstrated how complex and undesirable going into C&M is from a business perspective, if the intention is to recommence mining.
The industry’s perspective tends to sideline C&M as a policy issue and defend C&M as a phase of mining that should not be confused with ‘premature closure’ and ‘abandonment’. They reiterate industries’ obligations to existing regulations that are framed as being sufficient and point to financial assurances as being in place to avoid financial risk, while also calling for more flexible requirements for financial assurances. There is also the view that C&M is a reasonable response to broader economic pressures facing the industry with commodity prices regularly cited as the cause for C&M. This suggests that industry is unlikely to support any additional regulation for mines in C&M, particularly as industry rejects the notion that C&M is a problem, tends to favour deregulation and is of the view that existing regulations and voluntary standards are either sufficient or should be more lenient.

5.4 Non-Government Organisations (NGO)

There were ten submissions to the Senate Inquiry from environment groups that discuss C&M as a problem. Environmental Non-Government Organisations (ENGO) were critical of mining generally and C&M was raised to demonstrate ways in which companies can behave poorly, this was used as an argument for increased regulation. Three of these submissions identified specific problems with individual C&M sites including: insufficient bonds held for a site in C&M, an Australian company with a problematic C&M site overseas and an example of severe environmental pollution and health impacts from sites or parts of projects in C&M. The framing of C&M as a policy issue focuses on the environmental impact and argues for increased regulation. These submissions use individual examples rather than broader sector issues and may represent unique examples where things have gone badly and may not be representative of the broader industry.

Other submissions from environment groups refer to the “public interest” and threats to the “tax payer”. They point to a lack of data, evidence, transparency, research and monitoring. Some groups refer to C&M as being the same as abandoned mines, a point that is argued against by industry and one government submission. In relation to policy, half the environment groups frame C&M and the lack of any time restrictions as a loophole and four groups specifically advocate for time restrictions on how long sites can be in C&M. Half the groups also identify bankruptcy, administration and, or, the selling of projects as problematic. One
submission frames this as a strategy used by corporations to avoid rehabilitation and reference the Queensland Audit report.

Submissions from environment groups, which were highly critical of mining, point to examples of irresponsible behaviour from mining companies linking C&M to the avoidance of mine closure to advocate for reform. Linking C&M to the avoidance of mine closure is consistent with views from academics and the Queensland Audit report, though the tone is quite different. ENGO’s submissions on C&M raised other issues like health and pollution that are not widely considered in other literature or discussion. ENGOs make recommendations on reform that would restrict the use of C&M, but they do not hold a consistent view on how to regulate C&M. The most commonly shared view among ENGOs on regulatory remedies is to restrict the time mines can be in C&M.

5.5 Academic and Think Tank Perspectives

The academic literature that touches on C&M links C&M to the broader issue of a lack of mine closure and rehabilitation. C&M is described as falling between the cracks of policy by Ashby et al. (2016) who also links C&M to the possible abandonment of mines, the lack of rehabilitation works and threat to the environment. Laurence (2006) identifies specific environmental risks that could be associated with C&M, but discusses those problems as associated with premature closure which could include C&M sites but are not specifically about C&M.

Lamb et al. (2015) raise the lack of management at C&M sites and reiterate points made by the Queensland Auditor General that there is a trend of mines in C&M being sold as a way of avoiding rehabilitation. Lamb et al. (2015) also identify that C&M can disrupt mine planning and can lead to rehabilitation processes that are “done quickly with limited funds or equipment.” Buckingham (cited in Main and Schwartz 2015) also link C&M with a tactic used to avoid rehabilitation and suggests that when the true cost of rehabilitation is factored in a mine may be unviable.

A report by the Australia Institute, a progressive think tank, “Dark Side of the Boom” identifies that data on mines in C&M is scarce and raises the issue that distinguishing between mines
that are likely to recommence and those that are unlikely to restart is difficult (Campbell et al. 2017). References to C&M in this report are made with the premise that there are some legitimate C&M mines and then there are those that are in C&M to avoid mine rehabilitation and are at risk of abandonment.

There is limited academic writing specific to C&M, which is perhaps because there has been a focus and preference to write about mine closure, rehabilitation and abandoned mines. Abandoned mines are a much more obvious and intractable problem in the Australian mining sector. With over 50,000 abandoned mines in Australia (Unger et al. 2012), some with severe and expensive environmental problems and no substantial funds to rehabilitate those sites, it is clear why abandonment is a more widely discussed issue. C&M does however seem to be emerging as an issue in the academic sphere, for example Lamb et al. (2015), Erskine (cited by Main and Schwartz 2015), Ashby et al. (2016) and Marlow (2016) discuss C&M as a problem and publish literature on the broader issue of legacy mines and mine closure.

5.6 Summary

The review of how C&M is represented and regulated through this chapter indicates that C&M is sidelined as a policy issue. C&M is rarely described as a policy problem or discussed in the context of policy. Where C&M is raised as a policy issue there are conflicting views. ENGOs and industry at opposite ends of the spectrum frame mining as either being irresponsible and needing strong regulation or as being critical to Australia’s economy and needing deregulation. ENGOs identified examples of C&M being used irresponsibly and or resulting in pollution or adverse health impacts to support their argument for strong restrictions on the use of C&M. Industry conversely argued that existing regulations are sufficient to manage sites in C&M, reiterated that C&M mines are more like operational mines and must comply with operational conditions and distanced C&M from abandonment and legacy issues.

There is also a divergence in views along political lines, noticeable in the Senate Inquiry in which the Liberal National government did not respond to C&M as a problem and the ALP and Australian Greens both accepted it as a problem but made quite different recommendations on how to address the problem. The Senate Inquiry revealed tensions on the question of
whether there should be Federal intervention on the broader issue of mine rehabilitation, which is regulated by State and Territory governments. The Liberal National government argue against federal intervention. The ALP and the Australian Greens both adopted the view that there is a role for Federal government in responding to the problem of C&M in the broader context of addressing mine closure issues. Noting that existing regulations have failed to substantially address mine closure.

The mining sector, as represented by peak mining groups, sees C&M as legitimate; that there are sufficient existing regulations administered by state/territory governments; and that industry favour deregulation. The current federal government has a preference for deregulation and devolution of powers to the states and territories. This is evident through recent reforms that have devolved EPBC environmental assessments of MNES to the state and territory governments. The Liberal National Coalition Government and the ALP, as shown in the Senate Inquiry, have sidelined C&M as a policy issue. They have dismissed the role of the federal government by confining federal involvement in rehabilitation or C&M issues to MNES through the EPBC powers, which have almost entirely been devolved to the states through bilateral agreements.

Though there is little shared understanding or acceptance of C&M as a policy problem it is emerging as an issue in the context of an absence of mine closure. Through the Senate Inquiry the ALP and Australian Greens both identified and responded to C&M as an issue which may signal a shift in the broader understanding of C&M as a policy problem relating to mine closure.
Chapter 6: Care and Maintenance in Practice

This chapter considers interview responses and presents findings on the types of management issues at C&M site and how mines in C&M are regulated. While there are expectations that mines in C&M are managed this chapter considers issues around complacency, capacity and competing interests as a core problem. This chapter then considers specific regulatory tools and their benefits and limitations when applied to mines in C&M. Following the description of policy tools and their limitations this chapter then seeks to draw parameters around C&M as a stage of mining and then to offer a definition of C&M. This chapter finds that there is an imperfect set of tools that are applicable to mines in C&M and that clarity and guidance could help manage the risks but not solve the underlying issues that make mines in C&M a high risk. These more complex risks and underlying issues are considered in Chapter 7.

6.1 Care and Maintenance Mines are Still Mines

A common theme emerging from interviews is that mines in C&M are still required to meet all the legal obligations as though they are an operational mine, this reinforces statements made from industry outlined in Chapter 5. Out of the 16 interviews, 10 interviewees described that mines in C&M are still treated as though they are an operating mine in terms of having requirements that they need to meet (Appendix 5 – table 5.1). The view that C&M mines are treated as operational mines should not be taken literally as there are ample contradictory views about the uncertainty of these mines ever becoming operational again or the likelihood of abandonment. The likening to an operational mine is simply in reference to there being a set of existing requirements that apply to an operational mine that are undiminished by a mine going into C&M during its operational phase. These regulations are also not specific to or designed to address risks associated with being in C&M.

A response from interviewee B7 captures this sentiment best “We don’t, I think, have any guidelines or particular policies around C&M because for us C&M is a continuation of them meeting their environmental criteria... there should be no difference on how a miner meets its environmental criteria irrespective of whether it’s in operation, C&M, working towards closure or restart. So whatever stage of mining it is they've still got their same environmental approvals
and conditions that they need to meet. We have other policies and guidelines... a lot of those are of course applicable to mines that are in C&M”

Every jurisdiction in Australia has an assessment process for new mines; approved mines have a set of environmental conditions and monitoring requirements as well as mine closure requirements and a range of legislation that operating mines need to comply with, this is usually outlined in a mine plan. All of these laws, plans, conditions and requirements still apply to mines throughout their life including during C&M unless otherwise negotiated. However, the active regulation and compliance with these may change over time.

6.1.1 Capacity and Competing Priorities

While there are many regulatory requirements for mines that can be applied to mines in C&M there is some indication that compliance and enforcement with those requirements might become lax at C&M sites over time. The lack of attention to sites in C&M, by mines or environment departments, may not be intentional but may be a consequence of a lack of capacity within government, a lack of clear guidelines for managing C&M sites, competing priorities with the departments responsible for regulating mines, or be influenced by the political attitudes in government which are averse to restricting mining activities. One interviewee (B5) cautioned that there needs to be good strategies in place to ensure that obligations don’t get neglected. Interviewee B12 made similar comments but indicated that there is pressure within their Department to prioritise new applications over monitoring and compliance and that sites in C&M are at the bottom of the priority. Interviewee B6 described a lack of specific requirements to monitor C&M. The pressure identified by interviewee B12 suggests that attitudes in government do have an impact on how regulators prioritise work.

The gradual decline in attention to C&M sites by companies described by Interviewee B5 demonstrates a clear need for ongoing focus from regulators. Interviewee B5 explained that “What happens is once a site goes into care and maintenance, generally the attention that’s turned to the site gets less and less, and the longer it goes on for the less there is. And then that’s when difficulties start to come because it gets harder and harder to restart it. Partly because machinery just wears out, corrodes, suffers from lack of maintenance, those sorts of
things. And that also affects the ability for another company to come in and start it up ... It’s not always a matter where companies deliberately take away resources and under provide for an operation that’s been mothballed but through slow creep and attending to other things you know it’s easy to have things just slip by you... it can be a slow downward slide.”

Interviewee B12 described issues around competing priorities; “At the moment, these kind of tasks that come in they’re not related to applications we say this is something we should really do, we put it on our spreadsheet that keeps the list of all the jobs, but it’s down the bottom. It is literally the last section on the spreadsheet. It’s only one that people address when there’s... it’s reactive to an actual issue rather than preventative to any potential issue.” Interviewee B10 was very diplomatic in saying “I think we do very well with the resources we have, like anyone and everyone if we had more resources we could cover more ground.”

Complacency with C&M sites overtime may be exacerbated by issues of capacity and competing priorities within government agencies. In the Queensland discussion paper on addressing abandoned mines reform there were suggestions about improving departmental capacity, including skills, to deliver programs and mitigate and manage risks associated with abandoned and high-risk mines (Treasury (QLD) et al. 2018). Generic capacity and issues of competing priorities become problematic for mines in C&M where there is no formal regulation of mines in C&M despite the increased or changed risk.

When regulators become aware that a mine has gone into C&M it is likely that they will give that site some significant attention, though in the absence of clear guidelines this attention may diminish over time. Out of 12 interviewees who were regulators nine described the response and activity from the department when a mine goes into C&M. Seven interviewees (B1, B3, B4, B6, B8, B9 & B10) said that they would review the operating plan, environmental conditions, monitoring programs, they might send a compliance team to the site and or require a C&M plan (Interviewee B3, B8). Three interviewees (B3, B5, B9) said that they would check the government is holding enough security or bond for the site. Over time problems can emerge as competing priorities prevent mines in C&M from receiving the same level of scrutiny from regulators as they received when the mine initially went into C&M.
6.2 Existing Regulatory Options

This section identifies the regulatory tools used to manage the risks of C&M mines by analysing the responses from interviewees (see Appendix 5, table 5.7). Existing regulatory options to manage the specific risks associated with C&M are problematic. Some regulatory options like imposing fines, increasing bonds, forcing a mine in C&M to sell or close could lead to the company going into liquidation and the mine being abandoned. The lack of good regulatory options for managing C&M and the high risk of abandonment may lead to government inaction. The regulatory options identified through the interviewees are summarised in table 6.1 to identify: the regulatory tool; when that tool may be applied; and the potential impact of applying that tool. These are discussed in detail in the following sections.

Table 6.1: Regulatory options, when they might be applied & their potential impacts (based on interview responses)

<table>
<thead>
<tr>
<th>Regulatory Options (tools)</th>
<th>When this action may be required</th>
<th>Potential Impact of action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification (Interviewees; B1, B4, B7, B8, B10, B11, B12)</td>
<td>When a mine enters C&amp;M</td>
<td>- Gives government options to initiate a set of regulatory tools and review existing plans and conditions and consider changed risks</td>
</tr>
<tr>
<td>Forcing Closure/Rehabilitation (Interviewees; B2, B3, B7, B9)</td>
<td>When the remaining resource at a C&amp;M site is small and the company has no prospects of recommencing mining. This may happen by either cancelling licenses, or not extending approvals for operation plans. This is generally a last resort and may be triggered by a consistent failure of the company to comply with conditions.</td>
<td>- Rehabilitation and closure - Liquidation and abandonment</td>
</tr>
<tr>
<td>Progressive Rehabilitation (Interviewees; A1, B2, B3, B4, B5, B7, B10, B12)</td>
<td>At any mine throughout the life of the mine</td>
<td>- Improved understanding of site-specific rehabilitation challenges - Reduce overall closure costs - Better closure and rehabilitation outcomes - Reduces overall liability for company and government</td>
</tr>
<tr>
<td>Cancelling licenses, leases, tenements (Interviewees; B2, B7, B9, B11)</td>
<td>Where a company is non-compliant with meeting the conditions on a C&amp;M mine and where there is no foreseeable prospects of recommencing mining and the company is not amenable to selling the site</td>
<td>- Allows government to access bonds and or sell the mine</td>
</tr>
<tr>
<td>Time restrictions / Reviewing ‘mine plans’(^{21})</td>
<td>Putting a mine in C&amp;M may trigger the requirement for a revised mine plan this may be approved for a limited time e.g. 2 years. The government has</td>
<td>- Allows the government to review a mine plan and make new conditions.</td>
</tr>
</tbody>
</table>

\(^{21}\) The term ‘mine plan’ is used in general to describe an approved plan for mining and or mine closure – there are different
| **(Interviewees; B3, B9, B7)** | powers to cancel approvals based on the time rather than non-compliance – i.e. when the approval expires the government can either renew the approval or not. | - More leverage to encourage a company to sell the asset  
- Lead to the company pursuing an approved closure plan and or commencing an already approved closure plan  
- Cause a company to go into administration and or liquidation and the site to be sold or abandoned |
| **Requiring a C&M Plan**  
**(Interviewees; A1, A3, B3, B7, B8, B9, B10)** | A C&M plan may be required during the approvals stage of mining, as part of an operational plan or a mine closure plan, or within a certain time frame of entering C&M e.g. within 3 months. | - Set a comprehensive management plan that incorporates a range of regulatory requirements from a range of regulators  
- Clearly identify a pathway out of C&M  
- Set a time limit of C&M |
| **Amending Conditions**  
**(Interviewees; A4, B1, B3, B8, B9, B11, B12)** | Where a site in C&M has different, either reduced or increased, risks that require new conditions to best manage those risks | - Reduced or increased, monitoring and reporting requirements.  
- Possible financial relief from reduced monitoring for some aspects of a site |
| **Reporting**  
**(B1, B3, B9, B10, B11)** | At any mine throughout the life of the mine | - Provides an update to regulators on the operations and identifies how proponents are meeting conditions and rates of production |
| **Coercing / facilitating the sale of C&M sites**  
**(Interviewees; B1, B4, B7, B9, B10, B12)** | When there is a remaining mineable resource at a C&M site but where the existing company does not have the capacity to recommence mining, or is in administration | - Lead to a new owner recommencing mining  
- Lead to a new owner but may continue in C&M  
- Lead to a new owner who then tries to sell  
- Lead to a new owner who goes into administration and or liquidation |
| **Increasing bonds**  
**(Interviewees; A1, A2, A3, A4, B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, B11)** | When a mine in C&M is reviewed and the bonds are found to not be commensurate with the expected cost of closure. | - Can lead to a company going into administration and or liquidation.\(^{22}\)  
- May result in a more appropriate bond being held |
| **Definition\(^{23}\)**  
**(Interviewees; A1, A3, A4, B9, B12)** | Becomes relevant when a company claims to be in C&M | - Establishes parameters around the use of the terminology and what policies apply |

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\(^{22}\) Many interviewees discussed the importance of bonds being regularly reviewed and adjusted so that they are commensurate with the actual cost of a third party undertaking the full closure and rehabilitation as outlined in an approved closure plan.

\(^{23}\) A definition is not necessarily a policy tool but is an important aspect of applying policy tools.
### 6.2.1 Notification

Seven out of 16 interviewees (Interviewee B1, B4, B7, B8, B10, B11, B12) discussed requirements for companies to notify government about entering C&M. In the NSW Mining Act 1992 No 29, section 70 Conditions of a Mining Lease, a mine suspension must be in accordance with written consent from the Minister, suggesting that there is a process of applying to the Minister to suspend operations and place a mine in C&M. The WA Mines Safety and Inspection Act 1994 is one example of a statutory requirement for companies to notify if a mine has gone into C&M.

One of the interviewees from WA said “When you start looking at individual sites some of them might have commitments or obligations in their approvals that require them to notify us at certain stages but it’s not a standard thing across the industry” (Interview B10). Given that there is a standard requirement across all mines to notify of changes in WA, this response indicates that regulators do not have a clear understanding about the statutory requirements. In WA it was also identified that notification requirements are for a whole mine site, they do not apply if a single pit or other mine feature is put into C&M (Interview B11).

For notification requirements to be effective operators and regulators need to know that those requirements exist. There needs to be a clear definition of C&M, and a clear distinction between the C&M of a whole mine site and C&M of an individual mine feature. Definition of when notification of changes is required and who needs to be notified are also needed.

Four interviewees (B1, B4, B7, B12) said that they generally become aware a mine has gone into C&M either through the company notifying them, a request from the company to reduce monitoring, through ASX statements or through an annual report. Another interviewee explained that the notification of a mine going into C&M acts as a trigger for the Director of the EPA to require a C&M Plan (which is not always required) (Interviewee B8). In general, the notification of C&M could act as a trigger for a range of regulatory requirements: a revised operations plan or a C&M plan, the revision of fees, bonds, or other conditions.
6.2.2 Forcing Closure (including decommissioning and rehabilitation)

In instances where regulators might require a mine to be closed (which is not necessarily a regulatory option in every jurisdiction), there is the risk that the company does not have the funds available for closure or an approved closure plan. Four interviewees (Interviewee B2, B3, B7 & B9) described forced closure, but only two (Interviewees B2 & B9) indicated that there are specific mechanisms that empower government to force closure. However, they did not describe whether doing so was successful in achieving a closed and rehabilitated mine.

6.2.3 Progressive Rehabilitation

Eight out of 16 interviewees raised ‘progressive rehabilitation’ (Interviewees A1, B2, B3, B4, B5, B7, B10 & B12). Most responses referred to progressive rehabilitation as something that is required, these were mentions not discussion. Interviewee B5 raised that they are looking at ways to get companies to be more active with progressive rehabilitation and interviewee B7 talked about the benefits of progressive rehabilitation when it happens concurrently with mining. Where progressive rehabilitation is required and implemented this could mitigate some of the financial and environmental risks of a mine in C&M and at risk of abandonment. During C&M there is a key opportunity to take on some of the progressive rehabilitation works. Progressive rehabilitation is incentivised in WA and the NT through the requirement for an annual levy which is based on the cost of closure and area of disturbed land, consequently, levy payments are reduced as the rehabilitated area increases and the disturbed area decreases.

6.2.4 Cancelling Licenses

Four out of 16 interviewees talked about cancelling licenses, leases or tenements24 (B2, B7, B9 & B11), and described under what authority they would cancel a licence. In one case they just explained that it was something they had done. Generally, the cause for cancelling a license is non-compliance, it is probable that where there is non-compliance there are other actions that would be taken before cancelling a license which is seen as a last resort. One interviewee explained the actions that might be taken before cancelling a licence (B7); that there is a

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24 The term licenses is used to describe an authority over the area, eg. a lease or a tenement
“sliding scale of enforcement from negotiations and coercion all the way up to formal letter and then fines and really we only extinguish a tenement in extreme circumstances”.

6.2.5 Time Restrictions

Interviewee B7 explained how their department has reduced the period a mining lease is granted for this could be considered as a form of time restriction. “Where we used to give 21 year mining leases to anyone who asks, now you often get a mine lease for 7, 4 or even 2 years if we think that you’re a high risk of not meeting your environmental obligations and often mining leases get cancelled if we think you’re not meeting your obligations under your PEPR or you’re not going to get back there and mine or whatever and we obviously hold a sufficient bond to go back and do the rehabilitation.” The ability for government to reduce the time an approval is granted for based on the risk of a project follows a trend to use risk as a foundation on which to make conditions.

Other interviewees B9 and B8 both raised that they have an informal restriction of 2 years in their jurisdiction. In other jurisdictions the only reference to a time restriction is in the length of time a mine plan is approved for (Interviewee B2, B7). Time restrictions on approved plans gives regulators the ability to not renew the plan which could trigger forced mine closure or encourage a company to sell. Building in this mechanism gives regulators more options and companies more incentive to look for options to get out of C&M. The downfall is that extensions can be granted and so where there are intractable problems and no clear pathway out of C&M the default position is likely to be to extend any approval and keep a mine in C&M in preference to that mine being abandoned.

6.2.6 Operational Plans/ Care and Maintenance Plans

Different jurisdictions have different requirements for approved ‘plans’, ‘programs’ or ‘authorities’ to operate a mine, for the purpose of this section the term ‘operational plan’ is used to describe all such plans. See Table 6.2 below for the different names of operational plans used in different jurisdictions. In some jurisdictions there are separate mine closure plans, but they are generally included in an operational plan or are a condition of an operational plan.
<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Type of operational plan</th>
<th>C&amp;M Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW</td>
<td>Mining Operation Plan (MOP)</td>
<td>NA</td>
</tr>
<tr>
<td>NT</td>
<td>Mining Management Plan (MMP) / C&amp;M Plan</td>
<td>Yes (with clear guidelines)</td>
</tr>
<tr>
<td>Qld</td>
<td>Resource Authority (RA)</td>
<td>NA</td>
</tr>
<tr>
<td>SA</td>
<td>Program for Environmental Protection and Rehabilitation (PEPR - for mineral leases) Mining Operations Plan (MOP - for Private mines) Development Consent (DC very old mines)</td>
<td>NA</td>
</tr>
<tr>
<td>Tas</td>
<td>Mine Plan (MP)</td>
<td>Yes (but not for all sites and unclear about when and how a C&amp;M plan is required and there are no identifiable guidelines for C&amp;M plans)</td>
</tr>
<tr>
<td>Vic</td>
<td>Work Plan (WP)</td>
<td>NA</td>
</tr>
<tr>
<td>WA</td>
<td>Mine Plan (MP)</td>
<td>Yes (required through the Mine Closure Guidelines, refers to Environmental note which details environmental issues with C&amp;M, no guidelines for C&amp;M plans)</td>
</tr>
</tbody>
</table>

Out of the 16 interviews five interviewees directly discussed C&M plans or planning for C&M (Interviewee A1, A3, B3, B8 & B10). Others discussed operational plans (Interviewee B1, B2, B7 & B9). In WA and the NT there are requirements for C&M plans. In WA there is a requirement for C&M planning within Mine Closure Plans and that within three months of entering C&M a C&M plan needs to be approved. In WA there are no clear guidelines on what needs to be included in a C&M plan (Interviewee A3) however there is an environmental note on C&M that describes key risks and issues for C&M. In the NT there is a requirement upon entering C&M to submit a C&M plan as an amendment to the Mining Management Plan (MMP) for approval and there are detailed guidelines on what needs to be included25. In the NT there was also one example found of a mine, not in C&M, with a Conceptual Care and Maintenance Plan (CC&MP) which appears to have been required by the NT EPA.

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25 NT guidelines for C&M plans require information on; organisational structure, workforce, project details – location maps and site plans, previous activities and current status, work program, current site conditions, environmental management systems – environmental policy and responsibilities, statutory and non-statutory requirements, stakeholders and consultation, induction and training, identification of environmental aspects and impacts, environmental audits, inspections and monitoring, environmental performance – objectives and targets, performance reporting, emergency procedures an incident reporting, environmental management plans, closure plan, life of mine plan – unplanned closure, costing of closure. Under each of these headings are more specific details on what should be included.
Many factors are measurable before mining or during early phases of mining, preparing and planning for C&M based on the risks is also possible. Interviewee A1 demonstrated that some risks are identifiable and can and should be measured and planned for; “Things like maybe geotechnical risks so as an example if you have a large pit even if you have a major wall failure and there's a significant resource left you're probably still going to continue to mine because the economics suggests that even though it's going to cost a lot to reactivate the pit you're still going to do that. Versus if it's a single operator, underground mine and a single shaft if you lose that shaft the mines done, you're not going to start up again. So, should they have more proactive preliminary plans in place absolutely they should, and I don't think they necessarily do.”

Operational plans and or mine closure plans are required in all jurisdictions in Australia. In some jurisdictions when a mine goes into C&M regulators may require that existing plans be revised. While reviews or assessment of risk, monitoring and conditions may already occur in some jurisdictions, regardless of any formal C&M planning process, the lack of clarity is less than ideal. A lack of any formal C&M plan means that a lot of the activity is reactive. In Tasmania, there is generally a condition attached to a land use permit that gives the ability for the Director of the EPA to require a C&M plan, which is triggered by the notification of suspension of an operation (Interview B8). The requirement for a C&M plan may not be an actual C&M plan but a revised operational plan and this is not applied evenly across all mines (Interview B8).

6.2.7 Amending Conditions

Six out of the 16 interviewees raised the subject of conditions in relation to C&M, most interviewees talked specifically about monitoring conditions. An industry interviewee (A4) and one Government interviewee (B11) simply described what happens at a C&M site and commented that where there is a reduction in activity they might start ‘winding back’ monitoring. Other interviewees described that miners in C&M may request that their monitoring requirements be reduced (Interviewee B9, B11 & B12). Another interviewee
described a more government-initiated review and adjustment of conditions (B3) beyond monitoring. One interviewee (B12) explained that one of the ways they would find out a company has gone into C&M in the first place is when a company requests a reduction in monitoring. Interviewees B9, B7 and B3 describe how the request to reduce monitoring interacts with existing operational plans. One interviewee (B11) explained that the Minister can apply conditions at any time.

During C&M there may be a reduced risk because of reduced activity; for example, absence of stack emissions from an unused plant. Conversely the inactivity at a C&M site may lead to increased risks around dust emissions and a lack of staff to identify incidents and respond to them. Ongoing risks may continue like tailings seepage or there may be external factors that pose a management risks such as rain or fire. Most interviewees who discussed monitoring described that monitoring requirements are considered on a case by case basis based on the level of risk.

Interviewee B9 provided an example of amending conditions in response to changes in risk at a C&M site; “The company said well our fire risks have reduced significantly because we’re no longer having conveyers running through the coal and that was one of things that used to start the fires … and we’re also not having as many vehicles driving through the coal that could start a fire and we’re also not doing as much hot work that could start a fire... we said ok we accept all of those points but there’s another risk... these are external fires so a bush fire in the area can go into the mine… so we said yes we agree with you there’s a lot fewer fire risks on site that your causing yourself but there’s this external one, which is the main one, is still in play so you need to have enough people on site to deal with that under the different weather conditions. The hotter and windier it is the more people you need to have. So we actually put a requirement on them in just the past few weeks for this coming summer, because they reduced their staff right down to as few as four people over an area of 7km square. We said look that’s not enough to do what needs to be done so we gave them directions to increase that…”

The risks and issues relating to conditions appear in most cases to be captured through processes led by the company but appear to be ad hoc and not considered holistically across a mine site. Reduced activity on site does not always equate to reduced risk and, in some cases,
the reduced work force and active management of a site can increase risk for example - fire, tailings seepage, dust, chemical storage etc. A more formal process to identify changed risks at a C&M site is more likely to capture a holistic set of risks and result in a clear management plan or set of conditions to manage those risks. A C&M plan or revised operating or environment plan for a site in C&M is one way to consider the full set of conditions, monitoring requirements and risks. It would also improve transparency for stakeholders and different government agencies responsible for regulating a mine site.

6.2.8 Reporting

Five interviewees (B1, B3, B9, B10, B11) identified reporting as an existing regulatory tool used for mining which is relevant to C&M. Interviewees B1, B2 & B3 simply explained that there are reporting requirements for mines which continue through C&M. Interview B9 suggested that one of the ways their Department might identify a project is in C&M is through annual reporting data and regulators identifying a drop in production rates. Interviewee B10 identified that in the annual environmental reporting companies have to update a projects status.

More interesting is that reporting was identified as being important for helping identify the remaining ore at the site which in turn identifies how much longer the mine may be operating. Interviewee B10, in relation to information gathered from reporting, said “we've got information about the amount of commodity that's still there so if we've got a site that’s coming right towards the end of its expected life of mine that’s when we’ll be monitoring it potentially closer” (Interviewee B10). The value in reporting in relation to C&M is to identify where a mine has gone into C&M, to identify the remaining ore reserves which may be a trigger for other regulatory action and to monitor changes in environmental impact and risk.

6.2.9 Coercing / Facilitating the Sale of Care and Maintenance Mines

Out of 16 interviewees nine discussed the sale of mines in C&M as a pathway out of C&M. While there was a lot of discussion around the sale of mines, the role of government in that process and when government can or should intervene was unclear. Responses from government interviewees described either a passive or an active role for government in negotiating or instigating those sales. The cancelling of licenses through non-compliance or not
extending approvals for mine plans when approvals expire allows government to play an active role in facilitating the sale of mines in C&M. Mines in C&M may also be sold by the companies themselves, government may use the more passive role of coercion to influence this.

Interviewee B2 explained “we would be hoping to facilitate that another buyer would come on and take it over because that's going to be a better outcome to effectively rehabilitate it. We don't really want to get into the space where we have to actually get in and rehabilitate it ourselves. So, if there's a viable resource there, that's one of the best ways to get it addressed.” But other interviewees in discussing the sale of mines describe the government’s role as more passive for example interviewee B7 described “I've got a number of sites that I look after where administrators are responsible for the C&M and that's a bit more difficult because there's no real active rehabilitation going on and you are waiting for another buyer to come in and buy out the stranded asset and then meet some of the rehabilitation obligations.”

Whether the government plays an active role or not in initiating the sale there is still an active role for government in negotiating existing environmental liabilities through the sale. Interviewee B1 explained that “If a new owner comes in and purchases that they may well take on the liability of past activities. It's a bit of give and take…” Interviewee B4 explained in their jurisdiction that “the legislation is pretty clear, when there is no break in tenure the new company is responsible for the previous harm and previous disturbance, so like if the tenure just goes from you to me that's fine if there's a break in tenure and there was an abandonment the company can argue that the previous harm isn't theirs and we can't a) calculate financial assurance for it and b) unless you negotiate out that they are responsible for that they might be able to not take that on. We can always negotiate because they need to get an environmental authority from us, but it's not a neat process.”

It is likely that the process for negotiating the sale of mines and the liabilities associated with them vary in each jurisdiction. From interview responses it seems that there are a number of ways government might deal with selling mines in C&M, they could:

a) wait and hope the company sees the logic in selling
b) use coercion (a threat of some punitive action) to influence the company to sell
c) wait for an annual review or for an approval to expire and not extend or renew approvals
(this may be a form of coercion because in this scenario it’s likely the company still has rights to
the site - just not an approval to operate, the government may or may not be able to sell from
this position)
d) look for non-compliance to enact powers to cancel a license/ or forfeit tenements at which
point the government may be able to sell the site
e) if the company goes into administration – work with administrators to sell, or
f) if the company goes into liquidation and the mine is abandoned the government becomes
the owner of a site and can sell it.

In the case that government either cancels or forfeits a license, lease or tenement or where an
approval is not extended, it’s not clear what powers government has to sell those sites noting
that these actions may also be forms of coercion to influence a company to sell. When a mine
is abandoned it is clear that government becomes the owner of the site. If it is the case that
government are only able to sell a mine site that is abandoned, then the negotiation of
responsibility for existing liabilities is a significant factor and those negotiations may not result
in a new owner taking on those liabilities (see comments above from interviewee B4). This
reinforces that abandonment is the worst possible scenario.

The government’s objective in selling is two-fold, to ensure that a mine is sold and to ensure
that the new owner takes on the liabilities. Where a mine has been abandoned a new buyer is
in a strong position to argue against taking on exiting environmental liabilities. There may not
be very many interested buyers in a C&M or abandoned site, where there are environmental
legacies and a depleted resource with infrastructure that may or may not be well maintained,
putting government in a tight position in negotiations. There does not appear to be an example
of a clear process or guidelines for negotiating the transfer of responsibility for existing
liabilities.

The Government may use subsidies, exemptions or approvals as a way to negotiate in favour of
a new buyer becoming responsible for existing liabilities (Interviewee B4). Clarity around when
government can intervene in selling a mine would be beneficial, particularly where it could
avoid a break in the chain of custody which has the potential to weaken the governments
bargaining power over environmental conditions. A critical aspect of any change of ownership is that the new owner has the technical and financial capacity to manage the site and realistic prospects of reopening or the finances to close. This is discussed in Chapter 7.

### 6.2.10 Increasing Bonds

Bonds, also referred to as a financial assurance, bank guarantee or unconditional performance bond, protect governments from the costs of closure by requiring a mining company to estimate the cost of closure and pay the full amount or part of that amount as a bond. In every jurisdiction except for WA, bonds are the core mechanism that protects and incentivises against the abandonment of mines, including while mines are in C&M. Not all jurisdictions require a 100% bond. In some jurisdictions, bonds can be variable and be used to penalise poor performers by requiring a higher percentage of the estimated cost (Interviewee A4 & B4). In every interview except one (15 out of 16) there was a mention of bonds, 3 Interviewees (Interviewee B2, B3 & B9) described in detail that bonds are the principal regulatory mechanism to prevent the abandonment of mines, other interviewees shared the sentiment (Appendix 5 tab 5.6).

The benefit of having bonds includes securing the funds for rehabilitation regardless of the company’s survival, it creates a set of incentives for a company to meet their closure requirements and may also prevent uneconomic mines from opening. The financial incentive is clear, but there is also reputational risk that can impact on a company’s ability to borrow capital in the future. Interviewee B11 explained how a company spent $2 million to save $20,000 in bonds because losing that bond had a bigger reputational risk for the company. Interviewee B11 recalled that “there were certain projects where they couldn’t get funding from financial institutions, so the projects didn’t proceed.” This outcome is particularly useful where government’s may not have the ability to withhold approvals based on unsound economic plans.

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27 The NT requires a 100% bond as well as annual levy. WA requires an annual levy based on the estimated liability for closure, in unusual circumstances the Minister has power to require a bond but this is an exception to the rule.
Bonds are valuable for many reasons, but there are some issues. Seeking to increase bonds when a mine is already in C&M may place a significant financial strain on a company at a time when there is no income from production, cash reserves may be low and getting finance from institutions unlikely (Interviewee B11). Requiring an increased bond during C&M has the potential to put a struggling company into liquidation and to cause a mine to be abandoned. Two government interviewees (Interviewee B4 & B7) indicated that one of the first actions they take when a company goes into C&M is to review the bonds. Other interviewees discussed the importance of having regular reviews of the bond and adjusting them to reflect 100% of the closure cost, or 110% in some cases (Interviewee B7). A regular review can mitigate the risk of putting an excessive financial burden on a company with a mine in C&M.

One interviewee (A3) suggested that governments are not inclined to conduct the full closure and rehabilitation of a site, but they will secure a site and then figure out the next step – this was in reference to WA where bonds are no longer required. This was supported by other WA government interviewees B12 who said that they would secure a site rather than close it and B10 who described governments role in managing a site with the view to selling it as opposed to closing it. Interviewee A3 also made the point that governments only have to do what is legally required which is likely to be of a lesser standard than what some in the industry would do, particularly where they have made industry commitments to meet a certain standard of closure.

Bonds are the most common and effective regulatory tool to protect and incentivise against the abandonment of mine’s, but they are not perfect. Bonds need to be regularly reviewed and updated to avoid a scenario where a company is already in trouble and cannot afford any increase in bonds. Bonds should reflect the full cost of closure for a third party to undertake the closure, noting that it is likely to be substantially more than what it would cost the company. Levies used in WA and NT are also valuable tools to incentivise progressive rehabilitation and generate much needed funds to close existing abandoned mines, but levies do not protect or incentivise against failed closure or new abandonment. Levies should not replace bonds.

28 Before the introduction of the WA MRF the Department held $1.156 billion in bonds (DMIRS 2017) with the MRF in place they have relinquished over $1 billion and retained $138 million in bonds. A 2018 report of the WA MRF showed that between 2013 – June 2018, $140
6.2.11 C&M Definition

There wasn’t an overwhelming response from interviewees calling for a definition however responses suggest that there are implications for applying regulations and that a definition would help avoid the confusion that exists. Four interviewees agreed a C&M definition could be useful, three from industry, one from government. Perhaps the most significant interview responses on definition was from Interviewee B4 who explained how the absence of a definition impacts on their ability to regulate mines in C&M and limits their power to change conditions during that stage of mining. This has significant implication for the effectiveness of applying any regulatory tool.

Interviewee A3 stated that “the first thing you need to do is define the terms and what you mean by them. Otherwise people do tend to get themselves confused.” Interviewee A3 also raised consistency in terminology suggesting there are cultural difference in the use of C&M and confusion between post closure “monitoring and maintenance” (Interviewee A3). Interviewee A4 also identified that C&M is often confused with a post closure period of “monitoring and management” (Interviewee A4). In Chapter 1 it was identified that in some areas of Canada the term C&M is used to mean post closure ‘monitoring and maintenance’.

Interviewee A1 echoed concerns about consistency in the use of the term and confusion with other stages of mining, they said “if it is true C&M ... to me means that you absolutely plan to start up again if you don’t then it’s closed or it’s pre closure. So consistency in terminology is really important. So, you’ve got C&M, you’ve got pre closure and you have abandoned mines. Three very different things.” Interviewee A4 agreed that consistency has value; “I think a consistent understanding isn’t a bad thing... there is a lot of misunderstanding of what C&M actually is... people are conflating it with abandonment... I think a greater understanding of what C&M is would be useful.” They went on to explain that that premature closure is different to C&M, but that C&M can certainly lead to premature closure.
One interviewee demonstrated a confusion around the definition of C&M; they used the term C&M to mean *temporary closure with the intent of re-opening* but then made reference to a C&M mine that is closed, a mine which would be better classed as pre closure; “*(name of mine) is a coal mine not a bauxite mine ... it's closed, the smelter is closed so the coal mine associated with it is closed. It's been 2 years now and it'll probably be another 2 years before the works begin on the rehabilitation. So, in effect the sites in C&M.*” This should be classed as pre closure not C&M according to Interviewee A1’s description.

C&M can apply to a whole mine site and or an individual mine feature for example a tailings dam, a pit, a waste rock pile etc. Interviewee B11 explained that “*a pit can be isolated and not mined for a while that doesn’t mean it's been abandoned or whatever it's just 'isolated' it could be considered C&M but the projects not in C&M it might just be that one pit’s not being mined at that particular point in time.*” Using C&M to describe C&M for a single mine feature also appears in regulations in Victoria which require reporting on the stage of tailings. The Victorian regulations state “*care and maintenance refers to tailings dams into which no tailings material has been added during the reporting period, but where rehabilitation works have not yet commenced as the tailings dams may be utilised for tailings storage purposes again in the future*” (Victoria. Earth Resources. 2017).

The arguments made by interviewees above support the need for a clearer definition of C&M. In the case of interviewee B4 it is apparent that there are implications for regulators and how they can apply different tools by having a clear definition. In other jurisdictions the issue of being limited in the ability to apply regulations because of a lack of a definition was not raised but it may be the case that a lack of a definition means that there is a lack of clarity around any special conditions or exemptions that apply to a mine during the period of C&M.

Three core issues related to defining C&M as a stage of mining emerged from the interviews. The first issue was confusion with other stages of mining, for example, using C&M in reference to a mine in an early or premature phase of closure or when a mine is already closed or abandoned or post closure monitoring and maintenance. The second issue was the intention to recommence mining – the factor that sets C&M mines aside from pre closure and closure. The
third issue was that a company might put a mine feature (a pit, a facility, a tailings dam etc.) in C&M but the rest of the mine project might be in operation.

6.3 Defining Care and Maintenance as a Stage of Mining

Through this thesis C&M has been defined as: a stage of mining, where mining operations have temporarily ceased, where there are ongoing requirements to manage the site and meet environmental obligations, with the demonstrated intention to recommence mining within a reasonable time frame and where a company, group or individual, other than government, retains responsibility for the site

The significant aspects of this definition include:

- describing C&M as a stage of mining, to differentiate from other stages of mining
- using the language that mining has temporarily ‘ceased’, rather than temporarily ‘closed’ to distance C&M from closure – noting that the intent is recommencement of mining as opposed to closure
- specifying that there are ongoing requirements and obligations, to make it clear that C&M does not exempt companies from meeting obligations, this is described broadly to encompass a range of requirements which might include maintaining infrastructure as well as other conditions around safety, environment and monitoring.
- the intention to recommence mining should be demonstrated. In other words, it is important to separate C&M from other stages of mining like pre closure, closure, or abandonment where a mine is closed or closing. This is also worded to incorporate the idea of demonstrating the intention so that there is some evidence required by companies to legitimately place a mine in C&M, clearly articulating that the expectation is that C&M mines recommence mining
- explaining “within a reasonable time frame” to clarify that mines held in C&M indefinitely is not acceptable which addresses one of the core concerns about how C&M is used in practice
- the inclusion of the phrase “where a company, group or individual other than government retains responsibility for the site” is important to set C&M aside from abandoned mines. If government holds a site in C&M where there is no owner, it’s also
likely that other aspects of the definition and obligations can’t be met – like demonstrating the intention to recommence mining, fulfilling environmental obligations, maintaining infrastructure, make payments and other ongoing requirements and obligations a mine has, and which continue during a phase of C&M.

The following concepts are not included in this aspirational definition:

- A list of reasons for a site entering C&M is not included because it might be unnecessarily prescriptive and there are a wide range of reasons that may lead a company to make the decision to place a mine in C&M (Lamb et al. 2015), the reason is less important than the ability for government to negotiate around the conditions of entering into C&M and to define the desired outcomes.
- The element of choice to go into C&M (MCA 2017) or the need to negotiate with government about going into C&M is not included because it may be too prescriptive. Declaring that C&M is a choice of companies may inadvertently give the impression that companies are able to move in and out of C&M freely which should not be the case, alternatively negotiating with government to go into C&M restricts company’s ability to respond to market conditions. The way in which a decision to go into C&M is made is perhaps less important than detailing what a company needs to do once in C&M.
- removing the word ‘unplanned’ used in the DIIS and DMP definitions, given that the definition is aspirational there should be an aspiration that companies plan for C&M given the frequency that mines go into C&M, although going into C&M is unintentional and undesired there should be an element of preparedness and planning.

The definition does not include any distinction between a whole project and an individual mine feature. Both whole mines or individual mine features can be put into C&M but may be treated differently by operators and regulators. This distinction is made in Table 6.3 which incorporates ‘mine feature care and maintenance’ into the ‘operations stage’ given that the rest of the mine is still operating. Some mines may strategically place some features in C&M under different economic conditions or phases of mining to maximise profits.
The definition above is an aspirational definition. In reality, there are many pathways for mines in C&M to progress or regress to other stages of mining including – pre-closure/ closure/ relinquishment, recommencement of mining, indefinite C&M, abandonment (administration, receivership, liquidation), selling (either the asset or the company). These are shown in Figure 6.2 below. Among this list of pathways out of C&M there is only one that is considered in the definition and that is recommencement. A definition makes an impact on how policies are applied and so it is significant that the definition should focus on recommencement. However, some projects in C&M may never be able to recommence. How those mines are categorised and regulated need further consideration and attention, for example where recommencement is clearly not viable those mines should be in ‘pre-closure’ not C&M.

![Flowchart diagram showing potential outcomes or transfer of responsibility for mines in C&M](image)

**Figure 6.1: Potential Outcomes or Transfer of Responsibility for Mines in C&M**

C&M, whether for a whole project or an individual mine feature, describes something temporary and where operations have ceased but may recommence. However, where there is an individual mine feature in C&M but mining at other parts of the project is ongoing, the stage of the mine project is really still ‘operating’, the workforce is unlikely to have changed, processing facilities, other tailings facilities, other pits or underground workings are likely to all still be active. This aspect of defining C&M has the potential to cause confusion and is important that distinction is made between C&M of a mine features and C&M of a whole mine.
project so that regulatory approaches for whole mine projects in C&M can be developed without having to apply to individual mine features in C&M at operating mine sites.

The lack of understanding or consistency about C&M as a stage of mining is problematic. Table 6.2 is a revision of mine stages from Table 1.3 in Chapter 1, which was based on the Australian governments 2016 Guidelines – Leading Practice Sustainable Development Program for the Mining Industry – Mine Rehabilitation. The revised table is based on insights from interviewees and incorporates C&M, pre closure and post closure. Premature closure is not included as its own stage of mining because mines that have prematurely closed may either be in pre closure, closure or be abandoned. Premature closure just describes that a mine has entered a final stage of mining earlier than expected. A mine in C&M might end up in pre-closure, closure or be abandoned at which point it could then also be considered to have closed prematurely.

Table 6.3: Mine Stages (adapted from Chapter 1, Australian Department of Industry, Innovation and Science 2016 & interviews)

<table>
<thead>
<tr>
<th>Mine Stages</th>
<th>Description key activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration</td>
<td>Remote sensing, drilling, community consultation, base line environmental data collection, land clearing for tracks and drill pads, water management, waste management</td>
</tr>
<tr>
<td>Feasibility</td>
<td>Feasibility study considering all environmental, social and economic aspects of mining including mine closure</td>
</tr>
<tr>
<td>Planning and design</td>
<td>Consideration of all options for mining with thought to environment, social and economic aspects, community consultation *a critical phase for planning landforms and structures that will support mining and need closure</td>
</tr>
<tr>
<td>Construction and</td>
<td>A phase of intensive activity and employment to connect water, power, fuel and chemicals, construct crushing plants, processing facilities, waste rock storage, tailings storage, stockpile areas, accommodation, workshops, offices and roads and community consultation</td>
</tr>
<tr>
<td>commissioning</td>
<td></td>
</tr>
<tr>
<td>Operations</td>
<td>Operations commissioning stage – stripping for open pits/ development of declines/shafts, developing waste rock landforms and Tailings Storage Facilities (TSF) mature operations stage – steady operations and production</td>
</tr>
<tr>
<td></td>
<td>mine feature care and maintenance – where an individual mine feature eg. Tailings, mine pit, underground shaft etc. temporarily ceases operations but the rest of the mine continues to operate</td>
</tr>
<tr>
<td></td>
<td>pre-closure planning stage – refining closure criteria/ community consultation</td>
</tr>
<tr>
<td></td>
<td>progressive rehabilitation – rehabilitation of areas that are no longer required for the operation of the mine</td>
</tr>
<tr>
<td>Care and Maintenance</td>
<td>Where mining at a whole mine, mine feature, has temporarily stopped and the holder *(company or administrator) is responsible for compliance with ongoing monitoring, maintenance, reporting, fees and progressive rehabilitation requirements with the view to recommence mining</td>
</tr>
<tr>
<td>Pre-Closure</td>
<td>Working with the community and government to develop a set of agreed mine closure criteria and preparing to decommission and close a mine. A mine in pre-closure may have prematurely ceased operations without the necessary mine closure plans, these mines are not C&amp;M because there is no intention to re-commence mining</td>
</tr>
<tr>
<td>Abandonment</td>
<td>Where there is no staffing or activity on site and no holder with which responsibility for the site can be assigned and government assumes responsibility. Once a mine is</td>
</tr>
</tbody>
</table>
abandoned the government may either; secure the site and look for potential buyers to recommence mining; commence mine closure; or leave the site abandoned until funding becomes available to close. (*note there are 50,000 abandoned mines across Australia)

<table>
<thead>
<tr>
<th>Decommissioning and closure</th>
<th>Implementing closure plans, removing infrastructure, decommissioning tailings, reshaping landforms like waste rock landforms, re-establishing surface hydrology, treatment and disposal of waste-water, rehabilitation and remediation, monitoring, community consultation. This should include progressive rehabilitation throughout the LOM.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post closure – monitoring and maintenance</td>
<td>Ongoing monitoring and maintenance (or management) for any post closure problems, remedial works until relinquishment of</td>
</tr>
</tbody>
</table>

Table 6.2 lists ‘pre-closure’ twice. Once as an activity within the ‘operations’ stage of mining which is part of the Australian DIIS (2016) definition. It is included again as discrete stage of mining to offer an alternative to C&M for mines which are no longer operating, not yet closed and where there is no likelihood of re-commencing. As discussed among some interviewees, for mines where there is clearly no likelihood of recommencement they should be considered in a stage of ‘pre closure’, ‘pre closure’ is also used to describe activities during operation of a mine where final closure criteria and objectives are being negotiated with stakeholders and regulators.

Where closure is the most likely outcome there is little point in renegotiating operating conditions, maintaining infrastructure, exploring and looking at recommencement. As best practice guidelines suggest, the closure of mines needs to be undertaken in consultation with community. For mines in pre closure, developing closure criteria in consultation with communities and working towards achieving an approved mine closure plan are significantly different activities to maintaining a C&M site, and so require different descriptions and so ‘pre closure’ is listed as a separate stage of mining.

Figure 6.2 shows the interaction between C&M and other stages of mining. C&M may occur at any stage of mining, making it hard to incorporate to any one stage of mining. Therefore, C&M is described in Table 6.2 as its own stage of mining. Abandonment is not included as a stage of mining in Figure 6.2 but can occur at any time during any stage of mining, much like C&M.
Figure 6.2: Interactions Between Different Stages of Mining

6.4 Summary

Existing regulatory options have limited value in managing the underlying problems of a mine in C&M but are none the less important in providing avenues for government to intervene and regulate. A lack of specific regulatory requirements for C&M in most jurisdictions allows government to have flexibility in how they regulate mines in C&M. The lack of specific requirements, in some cases, allows regulators to use a range of other regulatory tools to manage and mitigate risks of C&M and work towards a positive outcome. In other circumstances, the absence of specific regulations for C&M may have allowed complacency and inaction to set in where there are intractable problems at a site preventing it from re-opening.

Regulatory flexibility should not preclude regulatory clarity. Clarity about requirements and expectations gives greater opportunity for regulatory interventions to be made and greater certainty for industry which would assist them meeting those expectations. Aspects of regulation where clarity could be required include: requirements to notify entry into C&M
which could act as a trigger for other actions; and requiring a C&M plan or a revision of operating or closure plans which might include a review of conditions and fees and progressive rehabilitation activities.

Setting a clear definition of C&M as a stage of mining has emerged as an important factor in both the application of regulation and for limiting the misuse of C&M. The misuse of C&M can in part be attributed to the inconsistency and confusion around C&M as a stage of mining. Separating C&M for other stages of mining, in particular abandonment, pre closure and post closure ‘monitoring and maintenance’ is important to arrive at a shared understanding and expectation about the types of activities that should be occurring during those different stage of mining.

Other regulatory options that are currently used in some jurisdictions are applied in a reactive way without guidance for companies with mines in C&M and often without clear resourcing or priority. Regulatory options of forcing closure, cancelling licenses, increasing bonds, or not extending approvals may be used to coerce mines into selling. Selling mines in C&M does not however ensure that those mines will recommence operation. Once sold these mines may sit in extended C&M or may be sold again or be abandoned. Protocols should be considered around the government’s role in coercing, facilitating or being responsible for the sale of mines as well as guidelines for the negotiation of custodial responsibility for environmental liabilities.

Clarity may assist regulators in managing and mitigating risk, provide guidance and certainty for industry and manage community expectations, which is all valuable. However, it is unlikely that regulatory clarity or regulations more generally can resolve some of the fundamental issues and uncertainties facing the mining sector that result in C&M. Chapter 7 discusses broader issues that cause mines to go into C&M and impact the ability or willingness of governments to instigate or companies to act to recommence mining or close mines.
Chapter 7: Care and Maintenance, Barriers to Recommencing or Rehabilitating

This chapter explores the barriers to the recommencement of mining or the closure and rehabilitation of C&M mines. Reviewing interview data and some grey literature, this chapter highlights the tensions and conflict in C&M regulation and the implications for mine closure. This review identifies aspects of C&M that make it difficult to regulate. Firstly, this chapter considers the governments priority to avoid abandonment the inability and, or, reluctance to enforce regulations to high risk C&M sites and suggests that some C&M sites are pseudo abandoned mines. The review of abandonment and indefinite C&M draws on ‘causal stories’ to understand the policy problem from a policy theory perspective.

The chapter then looks at three core issues which act as barriers to mine closure, the concept of sterilisation, corporate behaviour and managing uncertainty and risk. The emergence of sterilisation as a concept is reviewed considering how it supports the avoidance of mine closure and rehabilitation. Then corporate behaviour is examined and identifies problematic behaviour among large companies and the limitations of smaller companies to fulfil their closure requirements. Finally, the chapter discusses the range of factors that impact the viability of mines and considers mechanisms to identify and manage risk.

7.1 Legacy mines - Indefinite Care and Maintenance and Abandonment

Governments may allow mines to stay in C&M indefinitely to avoid mines being abandoned. This may be done through inaction, or rather by not taking any punitive action that may lead to the company going into administration or liquidation and a mine becoming abandoned. This section considers responses from interviewees on abandonment, avoiding rehabilitation and the benefits and problems with the existing regulation gaps.

Out of 16 interviews, 13 interviewees discussed C&M and abandonment or companies in administration (Appendix 5, table 5.429). Out of 12 government interviewees eight discussed

29 Other Appendix references that were used for consideration of this section: Details on the practice of mines going in and out of C&M – Appendix 4, table 4.2, column C / Details specific to C&M link to abandonment, defaulting, indefinite C&M – Appendix 5, tab 5.4 / Details specific for C&M and selling – Appendix 5 table 5.5 / Details specific to bonds – Appendix 5 tab 5.6
C&M in relation to abandonment or companies defaulting or being in administration. Among those eight it was generally accepted that some, not all, companies with mines in C&M are either avoiding closure or are at a high risk of abandonment or administration.

Three out of the four industry interviewees raised the issue of abandonment and indefinite C&M. One interviewee was of the view, in regard to C&M mines which are owned by a tier 3 company, that the mine is effectively abandoned or closed (Interview A1) “most mines that are said they’re in C&M are actually closed or abandoned...That’s the thing, that’s the default. If they (tier 3 companies) go into C&M it’s unlikely they’re ever going to start again unless they default, they go bankrupt, the government will pick it up from an abandoned perspective or another company will come in and try to operate it again.” Another industry interviewee was adamant that there was no link between C&M and abandonment and suggested that regulations have matured, they pointed to the use of bonds as a safeguard against abandonment; “I think safeguards are in place to avoid that (abandonment) happening or at least secured funds to cover any liabilities remaining should government be left with that liability. That doesn’t happen very often I would certainly hope” (Interview A4).

There are two possible benefits of mines going into C&M in relation to abandonment. The first is that if C&M was not an option for miners there is a likelihood that some mines would end up abandoned instead of in C&M. The second is that C&M does give the Government the notification that there could be fundamental problems with a site which has led to it going into C&M and may lead to it being abandoned – this warning gives government the ability to manage the risks to try and achieve a positive outcome for that site which might otherwise have been abandoned. However, the status of a mine whether it be officially listed as in C&M or abandoned does not change the fundamental issues at a site that make it a high risk.

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30 In the interviews there was a mixture of terminology used to describe different size companies. Bigger companies with multiple mines and, or a diversified portfolio of mines, referred to as ‘majors’, ‘tier 1’, or ‘larger companies’. Medium size companies did not get many mentions in the interviews, but where they were mentioned they were referred to as ‘mid tier’ companies. Smaller companies were most commonly referred to as ‘smaller companies’ or ‘tier 3’ companies. Tier 3 companies were characterised in some interviews as having a single mine operation or an exploration company trying to branch into mining (A3). The following sections will use ‘tier 1’, ‘tier 2’ and ‘tier 3’ to describe large, medium and small mining companies except where there is a direct quote that uses alternative terminology.
One industry interviewee explained the predicament of government in regulating sites in C&M and supports the issue raised in the Senate Inquiry that companies use C&M to avoid mine closure (see Section 5.2); “There are certainly companies that will just hold a site in supposed C&M to avoid doing their rehabilitation works. The mines Dep’t knows this but they don’t have a lot of ability to make changes. There are some requirements around expenditure on operations but it’s fairly minimal it can be as low as $5,000. It’s not hard to spend $5,000 on a site to claim it’s in C&M. The Department’s kind of boxed itself into a corner because if it actually then sort of then calls out that company and say’s no actually you’re closed the company can then just go into liquidation and hand back its lease and say ‘fine’ and avoid the whole thing anyway. The Department’s in a very hard sort of position where it if it makes too much noise around this C&M issue then it will end up with a greater number of abandoned sites on its book and at the moment it probably wants sites in C&M rather than abandoned. Which is an interesting policy situation” (Interview A3)\textsuperscript{31}. This statement goes to the core of the policy problem of C&M, that regulatory options to mitigate against the misuse of C&M are limited by the risk and potential for companies to abandon mines.

Interviewee B5 described four recent C&M projects that were abandoned; in two examples there was government intervention which demonstrates the point made above by interviewee A3 – requiring a company to close or increase bonds can lead to companies disclaiming. In a third example it seems there was ongoing government inaction... “We’ve had 4 operations go into liquidation over the last two to three years... the circumstances leading up have been various. One of them is because the operation had a major disaster on its site and was closed down by government because there was ongoing concern about impacts. One was because it had been struggling for years and years and when we asked them for increased financial assurance, they decided that they would get out. Another one had come to the end of its mine life, it had been sitting there just waiting around maybe someone wanted to do some final mining of the remnants of the ore body and no one came along so in the end it had got to the point where the company ran out of resources and again disclaimed.”

\textsuperscript{31} Interviewee A3 is speaking specifically about WA where there are no longer bonds required, the situation may be comparable in other jurisdictions to a lesser extent.
These examples provide useful scenarios to review through the lens of ‘causal stories’. They show that there can be unintended consequences to the regulatory decisions that are made. Stone’s (1989) table of types of causal theories offers types of action, consequence and cause. Using these types it could be seen that the range of regulatory approaches to address the risk of C&M described by Interviewee B4, which all led to abandonment were a result of unguided actions, with unintended consequences and have an inadvertent cause. Stone (1989) suggests inadvertent causes may be intervening conditions, unforeseen side effects, neglect, or careless omission.

The examples above show that where there was inaction or neglect, the company ran out of resources and abandoned the mine. Then there was forced closure which led to the company going bankrupt - intervening conditions with unforeseen side effects. Then there was an attempt to secure bonds which also led to the company going bankrupt – intervening conditions with unforeseen side effect. The omission of any regulation, resourcing or guidance may be also be considered a cause for the intractable problems with C&M. The omission of regulation for and carelessness in allowing companies to sell C&M sites to smaller companies who do not have the resources to survive a long period of C&M or fund recommencement or closure. All of the types of ‘inadvertent causes’ (Stone 1989) can be related to the way in which different regulatory tools are applied to C&M.

There is a slight blurring of the line with this interpretation of causal stories when considering that C&M sites becoming abandoned or being held indefinitely in C&M may be a deliberate attempt by companies to evade mine closure requirements. It is hard to call this unintentional, however the factors that lead a company into C&M are more likely to be because of carelessness or unforeseen side effects from business decisions, decisions about processes, environmental protections and safety factors at the mine site, or accidental from natural disasters. The factors that lead to C&M even when can be attributed to poor behaviour from companies are fundamentally inadvertent.

There have been two very clear statements through audit reports in Queensland and NSW that link C&M to abandonment and indefinite C&M. In Queensland the 2018 discussion paper in response to the findings of the 2014 & 2018 audit reports concluded that “C&M can be
perceived to be a precursor to a company entering administration or liquidation” (Queensland. Treasury et al. 2018, p.2). In NSW the Audit Report stated that “There is no mechanism to prevent a mine being in ‘care and maintenance’ indefinitely. The Department does not have a clear policy on the length of time and circumstances under which a mine can remain in ‘care and maintenance’. Indefinite postponement of rehabilitation and closure is therefore possible” (NSW. Audit Office 2017, p. 4).

The link between C&M and abandonment is complex. C&M is used by government to avoid abandonment. At the same time C&M mines that are held in C&M indefinitely could be seen as pseudo abandoned mines with comparable environmental, social and economic liabilities. C&M is not financially sustainable making projects in C&M a high risk for abandonment and their holding companies at risk of disclaiming. The inability or unwillingness to enforce regulations for fear of abandonment indicates a significant failure of existing regulations and highlights the ad hoc approach to regulating C&M mines. In this regard C&M and abandoned mines should be considered as ‘legacy mines’, where there is an ongoing risk and liability and few regulatory options to ensure the effective closure and rehabilitation and few scenarios that would support recommencement.

7.2 Objectives - Sterilisation vs. Closure

There is a tension between two objectives that exist within the mining industry and among mines departments, to mine and to close mines. The objective to mine is not just about establishing new mines but includes ongoing exploration, expanding existing mines and to protect against the ‘sterilisation’ of a resource that may become economically viable to mine in the future. With regard to C&M there is a tension between keeping a site open for future mining, despite unfavourable economic conditions, and requiring closure which would make future mining more expensive. There is a perception among some interviewees that closing a mine equates to sterilising a resource. This section considers sterilisation of a resource and how C&M is used to facilitate keeping a resource accessible for extraction. It identifies the tension this creates with the objective of closing mines, an important consideration in the context of an absence of closed mines in Australia.
7.2.1 Sterilisation

Sterilisation refers to the idea that an action, like prematurely closing a mine where there is still a remaining orebody, might prevent a resource from being mined in the future. The tension between closing and staying in C&M to avoid sterilisation emerged from interviews and revealed some important perceptions about sterilisation and valuing resources from government and industry. The term ‘sterilise’ came up in three out of four industry interviews, but all four industry responses described the sentiment of avoiding sterilisation. The three industry interviewees who used the term sterilisation did so in the context of government and policy, two of these interviewees are from WA the other from NSW.

One interviewee described that C&M is an issue for government who need to both protect the environment and make sure resources are accessible for mining (Interviewee A1). Another interviewee discussed the need for policy guidance and being upfront about the intent of going in and out of C&M, but the underlying need to not sterilise resources (Interviewee A3). Interviewee A4 emphasised the need for flexibility in policy to avoid sterilization. The other industry interviewee, who did not use the term sterilise, described the sentiment by explaining how companies will avoid closure where there is a resource left that could be of value in the future (Interviewee A2) a ‘mineable resource’.

There were four government interviewees who described the tension between a remaining resource and rehabilitation, none used the terminology ‘sterilise’. Interviewee B8 said they would encourage exploration to find more resources. Interviewee B10 said that you have to rehabilitate when there is no resource left. Interviewee B5 said they would look for assurance the company intended to mine in the future or they would encourage selling. Interviewee B9 said they would look to the company to prove there is still a resource at a site worth mining. While more subtle than industry responses the sentiment from these government interviewees is the same; if there is a resource left at a site the objective is to facilitate that resource being mined, consequently that the mine is not closed.

This sentiment is demonstrated by the Australian government in the 2016 Leading Practice Sustainable Development Program for the Mining Industry – Mine Closure handbook which includes C&M as a type of closure, “Closure may be only temporary in some cases, or may lead
into a program of care and maintenance. In this sense, the term ‘mine closure’ encompasses a wide range of drivers, processes and outcomes” (Australia. DIIS 2016, p.2). Elsewhere in the handbook this is clarified “Ideally, mines close only when their mineral resources are exhausted” (Australia. DIIS 2016, p.5) the emphasis is on exhausted. Greater clarity around when a resource is exhausted could be of benefit.

One interviewee suggested that perhaps there could be temporary land use for sites in C&M to support future mining. Interviewee A1 suggested that it might be beneficial to have temporary land uses for mines that are no longer viable but where there is still a resource that may be viable again in the future. Rather than completely close and rehabilitate a site, the existing mining landforms may support some other temporary activity until mining becomes economic again. A barrier to this, identified by the interviewee, is that existing legislation may prevent that from happening and it would require negotiation between government agencies, which is not well supported through legislation. In any case the emphasis on land use is important, recognising that an unrehabilitated site needs ongoing management and considering that there may be other options to fulfil that management need other than closing, mining or C&M. This is something that deserves further exploration.

The idea of sterilising a resource suggests that closure and rehabilitation might exclude future mining. One interviewee (A3) cautioned against sterilising resources but also identified that miners who have rehabilitated mines are reluctant to relinquish rehabilitated mines in case other miners seek to re-mine or mine their rehabilitated tailings or waste rock piles. This suggests that mining a closed and rehabilitated mine is not just possible but might be probable, which is at odds with the concern about ‘sterilisation’. There is nothing clear in legislation or in mine closure laws that would prevent a new mining company seeking to explore and mine an area that had been mined, closed and relinquished.

7.2.2 Closure and Re-mining
The threat of sterilising a resource may be overstated by industry. The greater threat is that the objective to close mines is of a lesser priority and in direct conflict with exhausting all resources, resulting in very few mines ever being closed and relinquished. The concept of sterilisation presumes that re-mining a mined and closed site is not possible. Re-mining may
not be economic, or a significant amount of value lost from the cost of moving landforms and dismantling infrastructure, however, it is possible. There is also a clear environmental, safety and public value in closing a mine during the indefinite period when mining that resource may (or may not) become economically viable. Temporary land uses, such as grazing for livestock or agriculture, could be considered a way of managing the land during extended periods where a mine may be in C&M, but this would need to be compatible with environment and community commitments and should not break a chain of custody and responsibility for closure requirements.

7.3 Remaining Resource and Infrastructure as Key Factors

The size and grade of the remaining resource at any given site is a key indicator of whether a site is likely to recommence mining or not and whether the government should require a site to be closed or not. Similarly, the infrastructure at a mine site is an important element which offers insights into whether a mine is likely to become profitable again or present prohibitive costs that prevent recommencement. This section considers interview responses that explain the importance of these factors in understanding whether or not a C&M mine is likely to reopen or not.

7.3.1 The importance of the remaining resource and exploration

Where there is a resource at a C&M site that has not been fully exploited the preference of the government and industry will be to mine rather than rehabilitate. The existing value in the infrastructure and the high cost of moving landforms for closure mean that industry will look for every opportunity to retain the value at the site for future mining (Interviewee A2). Similarly, government would prefer a site is mined because it delivers jobs and royalties and generates the funds needed to close a mine.

A few interviewees described the remaining resource as an important factor in whether a mine will re-open (Interviewee A2, B1, B2, B7 & B12). Where the resource grade, size, accessibility\(^{32}\) is low, a mine in C&M may either be hard to sell or difficult to convince shareholders to make
the required investment to recommence mining. Some interviewees discussed the importance of exploration in identifying new resources. One government interviewee explained that exploration is encouraged (Interviewee B8).

A lack of exploration and discovery of additional resources was also cited as being problematic and leading to sites going into C&M (Interviewee B12). Other interviewees described that sites in C&M may get sold to new companies who have the resources to invest in exploration (Interviewee B9 & B12). One industry interviewee (A2) explained how they are continually exploring to add more resource to a project, another industry interviewee described how sometimes a mine has started and the ore grade is lower than expected and so will put a mine in C&M to go back to do more exploration (Interviewee A3) interviewee B3 and B6 made a similar observation about exploration through C&M.

One interviewee described how they are able to measure a resource at a site “Generally speaking we know what resources are left in the mine sites in WA because they provide geological reporting to us they provide production reporting to us to royalties, we know what reserve was there when they got approved. Generally speaking, we've got information about the amount of commodity that's still there so if we've got a site that’s coming right towards the end of its expected life of mine that's when we'll be monitoring it potentially closer” (Interviewee B10).

Tracking the resource grade, size and accessibility as well as exploration activity can help regulators identify the risk of a project in C&M and potential pathways out of C&M. In some jurisdictions this may already be occurring. A lack of clarity and community consultation around exploration and the objectives of expansion and not sterilising resources is problematic in gaining community support for mining, particularly when the lived experience is more likely to be of exploration and expansion rather than closure and rehabilitation. Considering what resource remains at a mined site and understanding its value and future potential may be critical in managing C&M sites and in addressing the tension between closure and avoiding sterilisation.


7.3.2 The Importance of Maintaining Infrastructure

Seven interviewees discussed maintenance of infrastructure as critical to the effective environmental management of a C&M site (B4) and to whether or not the mine could ever hope to recommence mining (A1, A2, A3, A4, B3 & B10). Issues around infrastructure include the costs of closing or maintaining and often prohibitive costs of recommencing. Other management issues included the need to run machinery to flush and lubricate, to manage rust, and to prevent bolts from setting. General consensus among interviewees A1, A2, A3, A4, B3 and B10 is that processing facilities will degrade over time. If closed for a year or two a facility will need rebuilding and the costs to restart or rebuild would prohibit recommencing mining.

Interviewees A1 and A3 both noted that the company would be maintaining the infrastructure of mines in ‘true C&M’, if there is an intention to recommence mining. The indicator of maintaining infrastructure at a C&M site is included in the Commonwealth government’s definition of C&M. Interviewee A2 suggested that the cost of closing a processing plant may be around $1 million but restarting that plant is likely to cost around $15 million. Interviewee B3 raised the issues of competitiveness and new processing technologies which may stifle opportunity of C&M mines recommencing. Interviewee B3 suggested that retrofitting a processing plant is likely to cost around $200 million and unlikely to happen.

The maintenance of processing plants and other infrastructure is likely to give regulators insights into the viability of recommencement of mining at a given site. Recommencement is likely to be dependent on the state of key infrastructure and whether a processing facility needs to be rebuilt or retrofitted. This information in concert with information about the remaining resource is likely to give regulators strong indications about the prospects of recommencement.

7.4 Corporate Behaviour – Optionality vs. Vulnerability

The size of a company is a factor that is likely to affect why a mine is put into C&M and how that site is managed and whether that mine will recommence operations, be sold, closed or left in indefinite C&M. Ten interviewees raised the issue of company size in conversation about C&M. Three broad topic areas where size was a factor emerged, namely: corporate
responsibility; the cause of mines going into C&M; and the management and assessment of risk. Interviewees identified that the size of the company impacts their vulnerability to changes in market conditions and noted that different behaviours are associated with different sized companies.

### 7.4.1 Tier 3 Companies

Tier 3 companies are companies with limited financial capacity. Their mines are generally at a higher risk of abandonment. They are unlikely to be able to finance recommencement, unlikely to have resources to continue exploration and identify additional resources and unlikely to have other assets producing income to fund the C&M activity. One interviewee suggested that tier 3 companies are more likely to use C&M to avoid rehabilitation (Interviewee A3), another interviewee said tier 3 companies are less likely to reopen (Interviewee A1), five interviewees identified that tier 3 companies are either poor performers or don’t have the capacity to meet their obligations (Interviewee B5, B7, A1, A3 & A4).

One interviewee, from a tier 2 company who had recent experience of putting a mine into C&M offered some insight into how decisions are made when a company is economically weak; “When you’re operating at that (indicates 5% profit margin) you don’t make good decisions. It’s very difficult to make good long-term decisions, you’re always making short term, how do we keep her going for another week, decisions... if we’re operating here (indicates 5% profit margin) you’re sort of like how can we build this thing as cheaply and quickly as possible and what is the minimum we’ve got to do” (Interviewee A2). This comment was in the context of wanting to operate at a higher standard but that economic factors ultimately drive how decisions are made. The importance of linking profit margins and the ability to make good decisions offers a valuable insight about what to expect from smaller companies and their ability to be good performers.

Projects that are economically marginal or higher risk may need more stringent regulations, conditions, bonding arrangements. This application of regulatory tools at early stages of mine assessment may impact on the ability to open mines that have a high economic risk, or that are economically marginal. Preventing mines to open through applying strict regulations or conditions may be preferable to facilitating the opening, by not applying the most stringent
conditions. Marginal projects have a higher probability of not surviving fluctuations in the market and in the long term are at risk of being in C&M indefinitely struggling to meet closure obligations.

7.4.2 Tier 1 Companies

Tier 1 companies are financially secure. They are able to make strategic decisions about C&M and are more likely to re-open when it is strategic to do so or sell (or try to sell) problematic sites. Tier 1 companies have the option of holding on to a mineral deposit until mining becomes feasible again and still be able to afford the costs of recommencement. The responses from interviews suggest that tier 1 companies may be in a better financial position to make strategic decisions and affect commodity prices, but they may also use C&M to avoid rehabilitation or sell problematic sites to smaller companies who do not have the capacity to recommence mining or meet closure obligations.

Interviewee A1 identified the concept of “optionality,” where a tier 1 company has multiple mines and is mining multiple commodities and these mines are at various stages of production with various grades of ore. In response to market conditions this kind of operator has a range of strategic options to place some mines or parts of mines in and out of C&M to maximise profits in response to market conditions. In this scenario, where there is a clear plan to recommence mining, there is strong incentive to manage the site well to keep the utility of the equipment on site intact.

Three interviewees (B4, A1 & A3) discussed tier 1 companies placing mines in C&M and suggested that this might be done to drive up the commodity price by reducing the supply of that commodity. It was also described that tier 1 companies can “weather the storm” (Interviewee A3) of commodity price changes. These interviewees also discussed cost curves and profit margins as a way of describing a company’s vulnerability to market changes and likelihood of going into C&M.

Five government interviewees made comment about the behaviour of tier 1 companies relating to how they use subsidiaries (Interviewee B6) or tier 1 companies selling mines to tier 2 or tier 3 companies (Interviewee B3, B4, B5 & B7). Some of these comments were critical of
the behaviour others were simply descriptive. In some cases, selling mines to smaller companies who can be more agile and perhaps operate at lower costs and bring a C&M mine back into production may be valid. However there are some instances where the mine is simply not going to be profitable and the tier 2 or tier 3 company that has bought a C&M mine from a larger company may not have the financial capacity to maintain the mine or to recommence mining and may be forced to sell, or go into liquidation leaving an abandoned mine.

There is a tendency for mining companies (as explained by interviewee A2) to mine the most valuable resource first, in the hope of finding more ore through ongoing exploration programs and to pay off the capital borrowed to establish a mine. It is possible for some companies to mine the best most profitable grades of ore and sell the site when it becomes less profitable and or problematic. Big companies may also hold separate smaller subsidiary companies for each mine, making it easier to sell a whole company rather than an individual mine project which may involve some negotiation with state or territory governments.

One submission to the Commonwealth Senate Inquiry into mine rehabilitation offered an example of a tier 1 company in C&M which may be avoiding rehabilitation: “Out at Nhulunbuy, for example, you have the Alcan Gove alumina refinery now in care and maintenance, but you have the company, which is Rio Tinto, saying that it basically doesn't foresee any situation where it would be reopened. The question you have to ask in those circumstances is: why is it in care and maintenance other than to avoid the relinquishment of the rehabilitation bond and the commencement of costs associated with rehabilitation?” (Morris. D 2017 cited in Australia. Senate 2019, p. 59).

There are some noticeable differences and behaviour associated with the size of a company and their capacity to manage C&M sites and bring those mines back into production or close. Six interviewees linked the size of the company to their vulnerability of changes in commodity prices (Interviewee A1, A2, A3, B4, B11 & B12). There was the broad acceptance that there are mining companies who behave poorly - otherwise described as ‘laggards’ as opposed to leaders (Interviewee A3). Three of the four interviewees from industry all made some comment about tier 1 and tier 2 companies having some responsibility to lead and bring about
change and two interviewees described tier 1 companies in C&M as doing C&M well (Interviewee A3 & A4).

Size and capacity are perhaps just one factor that governments could consider in managing the risk of sites going into C&M noting that there are likely to be different challenges in managing sites held by different sized companies. It could be considered, perhaps overly simplistically, that Tier 1 companies may be more likely to use C&M as a lifeline – allowing them to make strategic decisions and influence commodity prices. Where-as Tier 3 companies may be more predisposed to using C&M as a loophole to avoid closure and rehabilitation that they simply don’t have the capacity to do.

7.5 Managing Risk - Predictable Factors vs. Stochastic Factors

There are underlying issues that impact whether a company in C&M is going to re-open or not. These are not driven by regulations, guidelines, community expectations or management plans, but by the financial capacity and management of the company and the potential value of the resource. A company’s capacity, the value of the remaining resource combined with the changes in commodity price will determine whether or not a C&M site will recommence mining. Two of these three factors, capacity and resource, can be measured and predicted and monitored for variations. The other, commodity price, is highly variable. This section considers the importance of measuring, recording and communicating information to manage and mitigate the risk of C&M.

7.5.1 Commodity Price

Most interviewees (14 out of 15 who discussed causes of mines going into C&M) link changes in commodity price and global markets to mines going into C&M, these influences can be considered as stochastic. A range of other factors may drive changes to the commodity price for a mineral. Some can be predicted others may be hard to predict. These factors include: the supply chain for a particular mineral; competitors opening or closing mines; corporate activity.

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33 Out of the 15 interviewees who discussed causes of mines going into C&M, 14 rated commodity prices, 10 rated resources and financial issues, 8 rated strategic corporate decisions, 4 rated environment, labour or operational problems, 2 mentioned supply chain issues and 1 mentioned infrastructure problems.
of buying and selling or stockpiling minerals or starving the market of minerals to affect the price; geopolitical situations like war and conflict; or, changes to policy which impact the mining sector (see Chapter 1.5). Based on the views of interviewees, commodity prices are considered a key driver for mines entering C&M, but a broader set of factors influence whether a mine will reopen. An upturn in the commodity price alone is not necessarily going to affect the company’s ability to recommence mining. The measurable factors at a C&M mine are also important to the recommencement of mining.

### 7.5.2 Resource and Infrastructure

Interviewees raised a range of factors that could indicate the prospects of a mine in C&M recommencing. These factors may be stochastic others are predictable and measurable (Interview B9). For example, two predictable factors consistently associated with recommencement by interviewees include: the remaining resource (Interviewee A2, B1, B2, B7 & B12) and the maintenance of infrastructure (A1, A2, A3, A4, B3 & B10) (see sections above 7.3). Other factors identified include environmental, geotechnical or safety issues, the state of the processing facility – degradation, efficiency, competitiveness with newer facilities, and cost to restart (Interviewee A2).

All of these factors are predictable, can be accurately measured and are considered to influence the likelihood of a mine in C&M recommencing. Further work on identifying the predictable and measurable factors at a mine site could establish indicators for the potential to restart and assist regulators in their approach to managing sites in C&M. The measurability of resources is considered in greater detail below.

Using government geoscience information and cross referencing with information from mining companies about the resource – how much resource was there, how much has been mined and therefore how much is likely to be left, along with any information from ongoing exploration at the site, could provide useful data to guide how government regulates a particular site in C&M. For instance, if it was clear there was a large and valuable resource left and that the company has strong financial capacity to bring that mine back into operation a government could determine that an extended period of C&M with a strong C&M plan might be suitable. Conversely where the resource left is minimal and not of a high grade and where there is no
exploration, or exploration results indicate there is limited prospects of a mineable resource, the government might prefer closure.

As discussed in section 7.2 there are tensions that exist between the objective of mining/avoiding sterilisation and mine closure. The remaining resource at a mine site is a key component of understanding the prospects of recommencing mining, as are the efficiency, maintenance and technology of processing facilities, and the geotechnical and environmental aspects of a mine. Without clear guidance on what resources, grades, size etc. warrant closure or extended C&M, or a more methodical way of assessing risk and the likelihood of recommencement at C&M sites, decision making in this area will continue to be opaque and likely to preference indefinite C&M to avoid closure/sterilisation. There are indicators that suggest whether a mine is likely to become operational again or not. Government should be aware of those indicators and be measuring them to inform how they make decisions about mines in C&M.

7.5.3 Financial Capacity - Early Detection Systems

Assessing financial capacity was recognized as a critical aspect of being able to effectively regulate mines. Interviewees identified important factors that might impact on a company’s financial capacity, these include profit margin, size of a company and size and grade of the ore. Interviewees B4 and B5 identified that they are undergoing a process of assessing financial and technical capabilities and assigning a level of risk to mine holders which will affect the amount of bond they have to pay. Interviewee B10 and B12 also indicated that there was an internal risk assessment process that would identify companies who had not been compliant through the operation of a mine will trigger some kind of risk level, though it wasn’t clear if that was for the company or the project but appeared as if it was for both. Other interviewees did not raise this issue but that does not mean that they are not already doing some level of financial or corporate risk assessment.

In the Achieving approved rehabilitation in Queensland 2018 discussion paper it was identified that through the Mineral and Energy Resources (Common Provisions) Regulation 2016 there are requirements for a company to demonstrate that they have the human, technical and financial resources to comply with a resource authority but this review of financial capacity
does not extend to capacity to comply with environmental and rehabilitation requirements. The discussion paper also highlighted that where there is a second company who has controlling interest in the company that operates the mine the government lacks the ability to assess that second company’s financial capacity and that the ability to assess is limited to a company’s capacity to meet resource obligations and do not include environmental or rehabilitation obligations (Queensland. Treasury et al. 2018 pg. 10). This issue is raised in response to an increasing number of mines at the later stages LoM and where companies are trying to divest.

The ability to assess financial and technical capabilities varies in the different jurisdictions but it is worth highlighting that in Queensland, their response to managing the risks around divestment and asset sales, specifically in response to the high risk of abandonment of sites in C&M, has been to increase government’s ability to assess a company’s financial capabilities and capacity with regard to meeting environmental obligations. Adopting this regulatory response in other jurisdictions will be helpful in mitigating the risk of small companies with no capacity buying and holding assets they can’t afford to manage, recommence mining or close.

The Achieving Improved Rehabilitation for Queensland Discussion paper also identifies that where the mine in question is operated by a subsidiary, the parent company may look to sell or divest the subsidiary. Where this occurs the State government doesn’t have the powers to assess the financial and technical capability of the buyer or entity with the controlling interest over the mine and the subsidiary. This process is regulated by Australian Securities and Investments Commission34 under the Corporations Act 2001 – section 50AA.

Queensland Treasury et al. (2018 p. 12) float the idea of reforming the Corporations Act 2001 but note it would be unlikely to occur and might impact other industries where this is not a problem. It’s suggested that there be “change of control assessments” (CCA) which would give governments power to assess the financial and technical capabilities of an entity that is seeking to take a controlling interest of a mining company (Queensland. Treasury et al. 2018, p. 14).

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34 Australian Securities and Investments Commission (ASIC) is a Federal Government agency who regulate the Corporations Act 2001 (Cth).
Strengthening state and territory powers to assess financial and technical capability could be expanded to include the assessment of parties with a controlling interest in a mine operation and those powers of assessment could be triggered by any change in controlling interest.

In Queensland, through the Department of Environment and Heritage Protection (DEHP), there are ‘intelligence collection plans’ to; “consider(ing) a range of additional information including debt, operator performance, and environmental values, use(ing) a data analytics and technology strategy to improve data collection and storage, collect(ing) information to provide indicators of precursors to non-compliance driving higher rehabilitation costs and failure to rehabilitate, assess(ing) financial risk indicators such as why and when mines go into care and maintenance” (Queensland. Audit Office 2018). The approach of monitoring the mining sector in this way is further testimony to the need for early intervention in high risk or vulnerable projects and demonstrates that there are a broader set of indicators that regulators could consider which may help inform their regulatory approach to managing those high-risk sites.

The earliest possible intervention is at the assessment phase of mining. When a company is preparing environmental assessment documents and studies that may include a draft mine closure plan there are options to require a draft or conceptual C&M plan for assessment. At this phase of mining a company is also likely to be preparing a feasibility or a definitive feasibility study (DFS) or bankable feasibility study (BFS) for internal corporate decision making on whether or not to proceed with a mine - a Final Investment Decision (FID). As identified in Queensland and in many of the interviews, there is an ability to require a company to demonstrate their financial capacity to meet their approval conditions. Strengthening these requirements and intervention points to manage risks before mining, during sales, takeovers, and major corporate decisions may assist in managing and mitigating risks of marginal projects which are likely to struggle financially.

7.5.4 Sharing Information Between Government Departments

Interviewees from WA and QLD talked about the importance of information sharing between government departments, specifically mining and environment, to help identify problem sites or non-compliance risks, and to have a coordinated approach to managing those risk. A lack of information sharing and clear delineation of responsibilities between different agencies was
raised in the QLD Audit Report (2014). Interviewee B5 highlighted the benefits of information sharing by saying “What we can do is amongst our-selves, between our agencies, talk about what we know about how companies are operating. For example, if a company starts to struggle it might start not to pay its annual lease rental fees, it might start not to pay council rates, or things like that. Or the environmental authority costs. That sort of thing. Or it might even from a safety and health concern it might start to get a little bit slack on the maintenance of the equipment and there could become a few safety issues relating to that - maybe there’s not enough staff on site to manage everything, those sort of things. They are all tell-tale signs that we can collectively get together and give ourselves a heads up on.”

Interviewee B12 also described a benefit in information sharing. Where there is a concern about a site they will engage with other government departments and where there is a problem site a working group between government agencies might be established “We do share a lot of information and when we’re dealing with something in care and maintenance and the risk of abandonment we almost always have a working group with them and other areas of government to make sure we’re all responding in the same way” (Interviewee B12).

In the 2018 Queensland Audit report, follow up from the 2014 report, the issue of communication between government agencies received considerable attention. The report noted that a manual on engagement between the environment and mines department had been developed and explained that the “manual covers: the roles of both departments; key areas and units within each department where interaction occurs; processes that need to happen; who is responsible; and what information should be shared and recorded. Both the Department of Natural Resources and Mines and the Department of Environment and Heritage Protection’s senior management and regional assessment staff confirm that the manual has clarified communication processes and protocols.” Such manuals and protocols, or more informal agreements, may already exist in other jurisdictions. It is worth noting their value and potential to help manage risks and ensure there is effective regulation of high-risk projects in C&M between government agencies.

7.6 Summary
This chapter has focused on the barriers and factors that impact the fate of C&M mines, whether they can recommence mining or be closed and rehabilitated. The chapter highlighted there is often no good outcome for mines in C&M, and conversely, a high risk of abandonment. In cases where regulatory action has been taken there have been adverse consequences leading to the abandonment of mines, and on the other hand, where there has been inaction and complacency mines have been left in indefinite C&M which can be seen as a pseudo abandoned mine. The chapter illustrates that existing regulations are not fit for purpose and upon application pose an even greater risk of abandonment. Further, by emphasising a ‘causal stories’ narrative (Stone 1989), C&M generates inadvertent causes, unguided actions and unintended consequences. Understanding these causes and putting in place regulations that are designed specifically to address these causes may therefore avert the unintended consequences.

Highlighting these unintended consequences enables greater understanding of the limitation of existing regulatory options and their ability to address the underlying problems of C&M. This connects to the broader issue of barriers to mine closure. This chapter has considered that the more subversive concept of sterilisation is at odds with clear policy objectives and requirements to close and rehabilitate mines. This suggests that the overwhelming priority to mine and extract resources impacts how decisions are made in government that may inadvertently or perhaps intentionally lead to avoiding or delaying mine closure.

The remaining resource and the viability of mine infrastructure are considered key factors that impact on the viability of recommencing mining. This is discussed within the context of ‘sterilisation’ or closure to suggest that greater clarity or guidance on how to evaluate the remaining resource and infrastructure may enable governments to make decisions about when to preference closure. Corporate behaviour is discussed in much the same way. Identifying that companies are prone to either avoid closure through C&M or to sell problematic sites depending on the companies’ size and capacity. Understanding the different risks posed by different sized companies, dependent on the value of the remaining resource and infrastructure may lead to different regulatory approaches to manage risk.
The chapter has also highlighted barriers to recommencement of mining and mine closure by reviewing the factors that give an indication whether a mine is likely to be able to recommence mining or not. This section finds that commodity prices are largely stochastic and hard to predict and while they are critical in driving mines into C&M they are just one among many factors that determine whether a mine may become viable again. It reiterates the importance of the remaining resource and the risks and values in infrastructure which are measurable and strong indications of future viability for mining.

Finally, the chapter considered the ability of governments to assess a company’s financial capacity and capabilities and draws on policy discussions in Queensland. It identified regulatory approaches being adopted in Queensland to increase state powers to assess financial capacity and the development of strategies to share information and co-ordinate between government departments in Queensland and WA. This chapter builds on the findings from Chapter 6, that existing regulatory approaches are limited and cannot solve the underlying issues that make mines unprofitable and act as a barrier to either recommencement or rehabilitation. This chapter uncovered broader tensions and barriers to mine closure that are not addressed in existing regulations.
Chapter 8: Summary of Findings and Conclusion

This thesis has focused on understanding the policy problem of C&M using scholarly and grey literature and interviews. The thesis reviewed scholarly literature on mine closure and legacy mines and the policy environment for mining regulations nationally. Grey literature on policy specific to mining and care and maintenance in all the states and the NT of Australia was also reviewed. In addition to the policy environment and broader literature, interviews with regulators and industry representatives, who have experience with C&M sites, explored the practice of how mines in C&M are regulated and managed. This chapter synthesises the findings to the core questions asked at the beginning of the thesis in three sections.

Firstly the ‘Policy Environment’, describes how C&M interacts with broader mine closure issues and how C&M is represented as a policy issue among stakeholders. Also, within the ‘Policy Environment’ the broader factors that influence the development of policy for the resource sector was considered. Secondly, the ‘Policy in Practice’ which reflects on the practice of C&M reviewing how policies are applied to care and maintenance sites, considering the broader set of barriers to mine closure and summarises that C&M can be used as both a loophole and a lifeline. Finally, the ‘Policy Problem’, this concluding section seeks to articulate C&M as policy problem and present a future research agenda.

8.1 The Policy Environment of Care and Maintenance

The absence of clear regulations or definitions for care and maintenance are a product of the broader policy environment for mining and mine closure regulations mine. This section condenses findings about the relationship between C&M and mine closure. Considers how C&M is represented as a policy issue and what the political factors are that influence mining regulations. This analysis seeks to explain why C&M has been able to persist as a regulatory gap by taking into account the broader policy environment for mining.

8.1.1 Defining C&M

C&M is not well defined, and the term is used inconsistently. However, where the term is defined it describes mines that have ceased operating temporarily. This is the most consistent understanding of the term, though many C&M mines never recommence mining. The absence
of a definition can create confusion which is evident by its misuse to describe post closure activities or pre closure planning. The lack of clarity and definition can restrict regulatory options. An aspirational definition of ‘care and maintenance’ has been developed through this study which incorporates key parameters around C&M as a stage of mining explicitly stating that the expectation is that these mines will commence mining (see section 6.3).

Care and Maintenance - A stage of mining, where mining operations have temporarily ceased, where there are ongoing requirements to manage the site and meet environmental obligations, with the demonstrated intention to recommence mining within a reasonable time frame and where a company, group or individual, other than government, retains responsibility for the site.

8.1.2 C&M and Mine Closure

Mine closure is recognised by regulators and industry as important and is now the subject of many modern policies. There is growing sentiment that modern mine closure policy has improved but failed to deliver a significant increase in closed mines (see section 2.1.2) (Glenn et al. 2014; Lamb et al. 2015). Mine closure has become a focus of regulatory reform in the mining sector in response to a legacy of abandoned mines and environmental and economic liabilities for which governments are now responsible.

C&M has recently emerged in policy discussion on mine closure and is increasingly identified as one way that companies can avoid mine closure and rehabilitation requirements (Queensland. Audit Office 2014, NSW. Audit Office 2017, Ashby et al. 2016, Vivoda et al. 2019). There has been a predisposition for policy discussions to focus on abandonment and mine rehabilitation regulations. Only recently through Auditor Generals reports in Queensland and NSW and the Senate Inquiry on Commonwealth responsibilities relating to mine rehabilitation has C&M been incorporated into policy discussions on mine closure and has subsequently received more attention. The connection between C&M and an evasion of mine closure is likely to receive more attention as the problems persist and as more and more mines evade closure through C&M.
8.1.3 Factors Influencing Resource Policy

There are many factors that influence resource policy development in Australia, including industry influence, public sentiment, international trade, and party politics. The resource sector operates globally and is affected by global markets. There has been a tendency for Australian governments to preference policies that encourage international trade and deregulation of trade, these can be described as ‘enabling policies’ (Vivoda et al. 2019) that encourage and seek to stimulate the mining sector. Internationally, some countries have moved towards more ‘resource nationalist’ policies which could be considered as ‘restrictive policies’ (Vivoda et al. 2019) which seek to deliver better environmental and social outcomes and a greater share of the benefits to host communities and countries. These types of enabling or restrictive policies can co-exist and in fact it is argued that effective regulation for the resource sector relies on a balance of the two (Vivoda et al. 2019).

The promotion of mining as critical to Australian jobs and economy is pervasive through policy discussion from both government and industry and promotes enabling policy to encourage investment and growth. Australia has, at times, shown a preference for a balance of enabling and restrictive policies. Recently however there has been a tendency to adopt more enabling policies. There has been significant criticism of the tactics used by the resource industry to exert policy pressure over government. There has also been criticism of governments’ inability to withstand this pressure and a subsequent failure to deliver policy that strikes a balance between private and public interests. The political factors that influence the broad approach to regulating the resource sector are significant in understanding options and barriers to future policy development in the area of mine closure and C&M and suggests that a restrictive policy approach is likely to be met with resistance from industry and some policy makers.

8.1.4 Existing regulatory environment and policy discussions and representations

There are just two examples of regulatory requirements specific to C&M in Australia, one each in WA and the NT. These are both requirements for developing C&M plans, however neither of these jurisdictions discuss C&M as a policy problem. NSW and Queensland have identified C&M as a policy problem in relation to mine closure and identified that mines may be held in C&M indefinitely and can be used by some companies to avoid mine closure. Queensland is the only jurisdiction that has both identified that C&M is a policy problem and is actively seeking to
address it. South Australia and Victoria are all but silent on C&M and the Tasmanian Minister for Mines has actively contested that there is any problem with C&M. C&M is emerging as a policy issue, but it remains marginal.

C&M is recognised as a policy problem by some NGOs, think tanks and unions, in research by academics, by the ALP, the Australian Greens (Australia. Senate 2019) and the NSW and Queensland state government (NSW. Audit Office 2017; Queensland. Audit Office 2015). In these cases, C&M is linked to issues of evading mine closure and subsequent environmental or social issues. Industry groups defend C&M as a legitimate stage of mining. These representations are focused on the economic and jobs value of the industry and hold the view that existing regulations are sufficient to manage any risks associated with C&M. They generally refute the notion that C&M is used to avoid mine closure.

A political split is evident in the modest and marginal discussions on C&M. The conservative Liberal National government and industry dismiss C&M as a policy issue. The moderate ALP and the progressive Greens acknowledge C&M is a policy problem but have different approaches to address it. In all cases C&M comes as a secondary issue to other mine closure issues. Unlike mine closure there is not a political consensus that C&M is a problem. There is however growing evidence and increased awareness about problems associated with C&M mines which may see the representation of C&M as a policy problem shift in the future.

8.2 Policy in Practice

This section considers the issues with policies relating to C&M and the barriers to mine closure. It revisits issues of corporate capacity and behaviour and tensions around mining and mine closure. This section describes the existing policy problem of applying regulations and offers a condensed set of regulatory tools for further consideration as possible options for managing C&M risks. In direct contradiction to the industries view that existing regulations are sufficient to address the risks of C&M described in the section above, this study has illustrated that existing regulations are not fit for purpose. Existing regulations are unable to address the underlying tensions that exists between the objective to mine and the objective to close mines. They are also unable to address external factors that influence whether or not a mine may become profitable again. The lack of a clear definition and the confusion between C&M, pre
closure and post closure also facilitates the misuse of C&M. A new regulatory approach is required to address underlying issues with both C&M and mine closure.

8.2.1 Problems with the Application of Regulatory Tools for Mines in C&M.

In most jurisdictions C&M is a regulatory grey area. With the exception of WA and the NT, there are neither policy documents specific to C&M nor any clear definition of C&M. The lack of clear guidance has enabled the creative application of other regulatory tools, not designed for C&M, to manage the risks of C&M sites and to limit the number of mines becoming abandoned. Policy tools, such as time restrictions tend to have limited value in that governments are likely to extend approvals or give exemptions because the alternative may be that the company goes into receivership and the mine abandoned. Applying other regulatory tools to sites in C&M are usually reactive, discretionary and done without guidance. A lack of specific guidance, priority or resourcing for C&M, particularly problematic sites, can lead to complacency and inaction. The table below is a summary of regulatory tools, identified in Chapter 6. These may assist in managing C&M sites but do not address the larger more systemic issues with mining that lead to mines going into C&M and prevent them from recommencing mining.

Table 8.1: Regulatory tools to assist in the management of C&M

<table>
<thead>
<tr>
<th>Regulatory Tool</th>
<th>Application</th>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>In the relevant Act(s) define C&amp;M</td>
<td>Have a clear, legal and binding definition of C&amp;M, which will assist in the development and application of other regulatory tools and be explicit in the expectation of C&amp;M as a temporary stage of mining where the intent is to recommence.</td>
</tr>
<tr>
<td>Notification of C&amp;M – site and feature 35</td>
<td>Requiring companies to notify the relevant department(s) upon entry into C&amp;M (or any change of mine stage)</td>
<td>There is a clear communication of change of mine stage which can act as a trigger for a range of other regulatory tools.</td>
</tr>
<tr>
<td>Conceptual C&amp;M Plans</td>
<td>Require a conceptual C&amp;M plan during mine assessment</td>
<td>A conceptual C&amp;M plan gives companies an opportunity to consider the risks around C&amp;M which can assist in both prevention and preparing for recommencement. This also gives regulators an opportunity to apply</td>
</tr>
</tbody>
</table>

35 Notification requirements could be separate for a whole mine project or individual mine feature, in any case it should be clear that there are different requirements for C&M mine sites, and individual mine features in C&M at an operating mine. An individual mine feature being placed in C&M is not a change to the “stage of mining”.
<table>
<thead>
<tr>
<th>Conditions around C&amp;M which may also help mitigate some associated risks.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C&amp;M Plan (incorporating time restrictions)</strong> Upon entering C&amp;M require the company to operate to an approved C&amp;M plan. Using a risk based and outcomes-based framework to address key risk areas and to work towards the desired outcome (recommencement) within a certain time frame.</td>
</tr>
<tr>
<td><strong>Progressive Rehabilitation</strong> Through operations plans and C&amp;M plans include requirements for progressive rehabilitation. (This could be incentivised through a levy system based on disturbed area, as done in WA and the NT, but should not replace bonds)</td>
</tr>
<tr>
<td><strong>Bonds</strong> Require 100% of the full cost of mine closure for a third party to conduct closure, as a bond, before mining commences, these bonds should be annually reviewed and adjusted to reflect the 100% cost of closure for a third party.</td>
</tr>
<tr>
<td><strong>Reporting</strong> Require and enforce publicly available annual reporting on C&amp;M, including detailed financial reporting on liabilities.</td>
</tr>
<tr>
<td><strong>Assessing Corporate Capacity</strong> Increase state government powers to assess, approve or reject projects based on corporate capacity of the company to meet all aspects of mining and mine closure.</td>
</tr>
<tr>
<td><strong>Assessing Changes in Controlling Interest</strong> Increase state government powers to assess, approve or reject changes to the controlling interests of a company operating a mine.</td>
</tr>
<tr>
<td><strong>Intelligence Collection Systems</strong> Using data storage and analytics systems, collect, store and analyse information about companies including debt, operator performance, and environmental values (Queensland Audit Office 2018).</td>
</tr>
</tbody>
</table>
A lack of a clear definition and guidelines that could restrict the use of C&M contributes the misuse and misunderstanding about C&M. Early detection and intervention could be triggered by changes to resource size, grade or accessibility; maintenance of infrastructure; the company’s capacity; changes in the control of a company; or emerging downward trend in the commodity price. These tools may help manage and identify risks and early intervention strategies may assist in avoiding C&M or abandonment.

### 8.2.2 Barriers to recommencement or Rehabilitation

There are many barriers to C&M mines either recommencing mining or undergoing closure and rehabilitation. Commodity prices, the remaining resource or other geotechnical factors and the company’s overall capacity play a pivotal role in determining the likelihood of recommencement. The outcome of mines in C&M is also impacted by the underlying tension between competing government objectives to facilitate mining and ensure mine closure.

A drop in the commodity price can act as a catalyst for driving mines into C&M however, a rise in commodity price is not the only indicator of whether a mine in C&M will be able to recommence mining. There are elements of mines that are measurable that indicate whether or not a particular mine has the prerequisites for recommencement. These include the value of the remaining resource and viability or safety of extraction, the maintenance of infrastructure and estimates costs of repairs, retro fitting or rebuilding and the companies size and financial capacity. These three elements in concert with a lift in commodity price may determine whether or not a mine is likely to be able to recommence.

These measurable factors, along with other data about a company’s performance and compliance may provide insights which could form the basis for developing guidance or benchmarks that determine when closure or selling or some other regulatory action may be preferred. This kind of approach is being adopted in Queensland. Further review on the
application of this and its success or failures may be valuable for other regulators and policy makers in understanding options for addressing the policy problems with C&M and mine closure.

Through interviews the use of the term ‘sterilisation’ was identified as a way of describing the avoidance of closure to ensure the accessibility of resources for future mining. The use of the term signals a preference for not closing mines, this is not clearly identified or articulated in policy or policy discussion but is evident in discussions on C&M and mine closure among regulators and industry. The concept of ‘avoiding sterilisation’ is a clear conflict with requirements and expectations for mine closure, for which there is significant policy and guidance. The emergence of the term and concept is particularly problematic for mines in C&M given that the application of regulation is reliant of the discretion of regulators in the absence of specific C&M policy. The emergence of the term and the concept of sterilisation is a significant learning from interview responses and represents a barrier to the closure and rehabilitation of C&M mines that warrants further research and investigation.

8.2.3 Care and Maintenance as a Loophole or Lifeline

C&M is used as both a loophole and a lifeline. During periods of low commodity price or where there are safety or environmental issues that need to be addressed, C&M provides an opportunity for companies to stop producing, retaining value of the ore, while addressing site specific issues or waiting for improved market conditions. In this scenario C&M is clearly a lifeline for those companies. Governments may allow the use of C&M as a way of avoiding abandonment. Mining companies can use C&M to evade mine closure requirements and costs. Whether allowed by government to avoid abandonment or used by companies to avoid mine closure C&M can be seen as a loophole. In practice this form of C&M simply facilitates a delay in the abandonment, or results in sites being held in C&M indefinitely and prevents mine closure.

Whether C&M be used as a loophole or as a lifeline, holding a mine site in C&M is undesirable. C&M is not financially sustainable for the company, it costs a significant amount to both close a mine and to actively manage a mine in C&M. C&M is a period where the mine will not be
producing income, making C&M mines a high risk for abandonment. C&M reduces staff and organisational knowledge of the site and infrastructure and so diminishes the opportunities for the highest standard of mine closure. C&M also prolongs environmental and safety risks from the storage of chemicals and hazardous materials to managing leachates, water flows, fire risks, erosion, dust pollution and public access. Together with these ongoing risks and degradation, a company’s financial resources are being depleted and not replenished. In effect, there is a negative overall impact on their future capacity to recommence or close the site and meet all their conditions. Some companies who intend to use C&M as a lifeline may consequently end up using C&M as a loophole.

8.3 Conclusion – The Policy Problem

This research has identified that in the absence of clear regulations C&M is in an ‘in-between’ policy space which allows it to be used as both a loophole and a lifeline.

Where C&M is a loophole, allowing mines to slip into abandonment or stay in C&M indefinitely, it is useful to refer back to causal stories and types of causal theories (Stone 1989). The policy problem of C&M is that existing government actions are unguided due to the ‘omission’ or absence of clear definitions or regulation for C&M. Where ‘intervening conditions,’ that are not fit for purpose, are applied there can be ‘unforeseen side effects’ causing companies to go into bankruptcy and abandon mines, where there is ‘neglect’ or where complacency has set in companies may simply run out of resources and disclaim. There is ‘carelessness’ in allowing companies to sell C&M sites to smaller companies without the capacity to maintain, recommence or rehabilitate the site which also can lead to indefinite C&M or abandonment. Underpinning all these causes is the ‘omission’ or absence of any regulation to guide regulators or companies and restrict certain activities which are known to have adverse outcomes.

The policy problem of C&M is that existing regulatory options available to address the misuse of C&M are not fit for purpose and are limited by the risk and potential for companies to abandon mines and the inability to make uneconomic mines viable again. In the absence of good policy options and where there are no clear pathways out of C&M, complacency and inaction can lead to prolonging mine closure indefinitely, these sites may be considered mining legacy sites or pseudo abandoned sites.
The barriers mentioned above are exacerbated by some poor behaviour in the mining sector. The mining industry is diverse and imperfect. There are some smaller companies that are simply not capable of meeting their environmental and mine closure obligations. There are larger companies who have little regard for the consequence and have no regulatory constraints in selling unprofitable mines to companies who don’t have the capacity to recommence mining or close mines. The industry is also dominated by stochastic commodity prices and site-specific uncertainties making the profitability of mines highly variable and vulnerable to external factors. C&M may be deliberately misused by some companies and for others it is may be an inadvertent consequence of operating a marginal mine during unfavourable market conditions.

The ongoing risk is that regulatory reform for C&M will continue to be sidelined. There is a preference by most governments for deregulation and enabling regulations, driven by the rhetoric of attracting investment and the promise of jobs and royalties. In public forums both industry and government have sidelined C&M as a policy issue. However, through interviews, it is apparent that there is some appetite among both industry and regulators to improve C&M regulation or at the very least improve clarity about its definition and requirements.

The lack of guidance and dedicated resources for regulators to respond to C&M mines combined with competing objectives and the threat of abandonment put regulators in a very difficult position when considering the regulation of C&M sites. Further thinking and research on the potential for policy tools to address risks associated with the broad uncertainty in the mining sector would be valuable in addressing C&M as a pathway to avoiding mine closure. Reviewing the development of powers in Queensland to assess changes in the controlling interest of companies and mine projects, would provide useful insights about the merits of that tool in protecting against abandonment and indefinite C&M.

A broader investigation of how pervasive the concept of resource sterilisation is within government and regulations and how it impacts the decisions regulators make would assist in understanding the broader barriers to achieving mine closure. Further examination of the measurable and translatable factors that could determine at what point closure should be a preference to extended C&M may be a valuable process. As C&M continues to emerge in
policy discussion on mine closure these may provide useful avenues of research to identify policy solutions.
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resources/insolvency/insolvency-information-for-directors-employees-creditors-and-shareholders/insolvency-a-glossary-of-terms/


Australia. Department of Industry Tourism and Resources. 2006. MINE CLOSURE Leading Practice Sustainable Development Program for the Mining Industry - Mine Closure and Completion October 2006


Australian Government and The Australian Capital Territory Bilateral agreement made under section 45 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) relating to environmental assessment

Australian Government and The Northern Territory of Australia (2014) Bilateral agreement made under section 45 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) relating to environmental assessment


Australian Government and The State of South Australia (2014) Bilateral agreement made under section 45 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) relating to environmental assessment

Australian Government and The State of Tasmania (2014) Bilateral agreement made under section 45 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) relating to environmental assessment


Australian Government and The State of Western Australia (2014) Bilateral agreement made under section 45 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) relating to environmental assessment


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http://www.mondaq.com/southafrica/x/648072/Mining/Proposed+Financial+Provisioning+Regulations+For+Mining+Rehabilitation+Released+For+Comment+in+RSA


### Appendix 1 Content Analysis – State and Territory Policy – C&M related content

**NSW Policy – Content Analysis**

<table>
<thead>
<tr>
<th>Policy Document</th>
<th>C&amp;M</th>
<th>Premature</th>
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<th>Moth</th>
<th>Suspended</th>
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<td>Environmental Planning and Assessment Act 1979 No 203</td>
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<td>NA (in relation to C&amp;M)</td>
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<td>Mining Act 1992 No 29</td>
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<td>NA (in relation to C&amp;M)</td>
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<tr>
<td>Contaminated Land Management Act 1997 No 140</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA (in relation to C&amp;M)</td>
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<td>EDP10 – Public Access to Environmental Information</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>ESG3: Mining Operations Plan (MOP) Guidelines, September 2013 (ESG3)</td>
<td>Types of changes that would typically require a new MOP include: the mine is placed into care and maintenance; or premature or unplanned closure.</td>
<td>Types of changes that would typically require a new MOP include: the mine is placed into care and maintenance; or premature or unplanned closure.</td>
<td>NA (in relation to C&amp;M)</td>
<td>NA</td>
<td>NA (in relation to C&amp;M)</td>
<td>NA</td>
</tr>
<tr>
<td>ESP1: Rehabilitation security deposits</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>NSW Auditor-General’s Report Performance Audit Mining Rehabilitation Security Deposits Department of Planning and Environment. May 2017</td>
<td>There is no mechanism to prevent a mine being in ‘care and maintenance’ indefinitely. The Department does not have a clear policy on the length of time and circumstances under which a mine can remain in ‘care and maintenance’. Indefinite postponement of rehabilitation and closure is therefore possible. ‘Care and maintenance’ is the period following temporary cessation of operations when infrastructure remains largely intact and the site continues to be managed. There are a range of valid reasons for a mining company to put a mine in ‘care and maintenance’, but it is also reasonable for the community to expect a limit to how long it has to wait for proper rehabilitation.</td>
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</table>

**Notes:**

- Recommendations: developing clear policy and procedures for ensuring a mine cannot be put into ‘care and maintenance’ indefinitely.
- There are few examples of large mines in NSW which have been successfully rehabilitated and closed to modern environmental standards. There are a range of reasons for this including weaker rehabilitation obligations in the past, and mine sites expanding or being placed into ‘care and maintenance’ rather than being closed and fully rehabilitated.
- A new MOP and cost estimate are also required if there are changes to the development consent or closure criteria, major variations from the planned surface footprint of the mine, if the mine is placed into care and maintenance, or premature or unplanned closure. Where security is calculated on the current level of disturbance, a new rehabilitation cost estimate is to be submitted on an annual basis.
- The audit focused on large coal and metaliferous mining operations, as they account for the majority of the mining-related disturbance across NSW. We reviewed 13 mines comprising a mix of underground and open-cut sites, spread across three regions. Eight sites were operational, three sites had ceased operations and two sites were in ‘care and maintenance’.
- Department is yet to develop a clear policy on the length of time a mine can be in ‘care and maintenance’ and the circumstances in which a mine can continue in that condition. This creates the potential for mine closure to be postponed indefinitely.
- The Department is reviewing the mine regulatory process for current and future open-cut coal mines. It advised the review is likely to examine the planning approval process, including specificity about the outcomes to be achieved and the standard of rehabilitation required. The Department is also planning improved guidance and enhanced oversight, which should improve the quality and consistency of rehabilitation of mine sites.
- Recommendations enhance oversight of mine rehabilitation by developing a clear policy and procedures for ensuring a mine cannot be put into ‘care and maintenance’ indefinitely.
## NT Policy – Content Analysis

<table>
<thead>
<tr>
<th>Policy Document</th>
<th>C&amp;M</th>
<th>Premature</th>
<th>Temporary</th>
<th>Moth</th>
<th>Suspend/d</th>
<th>Inactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINING MANAGEMENT ACT As in force at 31 December 2018</td>
<td>4 mining activity means any of the following activities: (f) operations for the care and maintenance of a mining site when an activity referred to in another paragraph of this definition, except paragraph (e), is suspended.</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>see 20B</td>
<td>NA</td>
</tr>
<tr>
<td>VALIDATION (MINING TENEMENTS) ACT 1987</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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</tr>
<tr>
<td>MCArTHuR river project AGREEMENT RATIFICATION ACT 1992</td>
<td>Services means the services of engineers, surveyors, architects and other professional consultants, experts and specialists, project managers, manufacturers, wholesalers, retailers, suppliers and Contractors and includes any other services necessary or incidental to the construction, continued operation or care and maintenance of the McArthur River Project.</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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<td>NA</td>
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<tr>
<td>MCArTHuR river project AGREEMENT RATIFICATION ACT 1992</td>
<td>subject to clause 19 abandons the McArthur River Project and does not resume operations on the McArthur River Project within that notice period. For the purposes of this provision, &quot;abandons&quot; shall include placing the McArthur River Project on a care and maintenance basis for a period of more than one year or a number of periods which total more than one year, provided that the Minister may in writing in his discretion extend that period of one year;</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>TANAMI EXPLORATION AGREEMENT RATIFICATION ACT 2004</td>
<td>Services means the services of engineers, surveyors, architects and other professional consultants, experts and specialists, project managers, manufacturers, wholesalers, retailers, suppliers and Contractors and includes any other services necessary or incidental to the construction, continued operation or care and maintenance of the McArthur River Project.</td>
<td>NA</td>
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<tr>
<td>MERRYR project AGREEMENT RATIFICATION ACT As in force at 1 May 2016</td>
<td>subject to clause 14 abandons the Merlin Project and does not resume operations on the Merlin Project and for the purposes of this provision, abandons shall include placing the Merlin Project on a care and maintenance basis for a period of more than three (3) years or a number of periods which total more than three (3) years, provided that the Territory may in writing at its discretion extend that period of three (3) years; or</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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</tr>
<tr>
<td>MINING (GOVE PENINSULA NABALCO AGREEMENT) ACT 1968</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>MINERAL TITLES ACT As in force at 7 November 2016</td>
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<td>NORTHERN TERRITORY ENVIRONMENT PROTECTION AUTHORITY ACT As in force at 12 April 2017</td>
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<td>MINERALS (ACQUISITION) ACT As in force at 21 September 2011</td>
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<td>ENVIRONMENTAL OFFENCES AND PENALTIES ACT As in force at 13 April 2011</td>
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<td>ENVIRONMENTAL ASSESSMENT ACT As in force at 1 January 2013</td>
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<tr>
<td>MINING MANAGEMENT REGULATIONS As in force at 1 October 2013</td>
<td>Mining Management Plan Structure Guide for Care and Maintenance Operations. DPIR 2017 This Advisory Note outlines statutory environmental management requirements during care and maintenance operations. When a mine site is placed under Care and Maintenance (C&amp;M), ongoing environmental obligations are required to be met to ensure compliance under the Mining Management Act (MMA).</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Mining Management Plan Structure Guide for Care and Maintenance Operations. DPIR 2017</td>
<td>When a mining site is planned to enter C&amp;M status, a C&amp;M Plan must be developed. The C&amp;M Plan must establish the status of all landforms and infrastructure with respect to the environmental risk of each aspect during the expected period of C&amp;M and the environmental management strategies and activities planned to manage/minimise the environmental impacts.</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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</tr>
<tr>
<td>Mining Management Plan Structure Guide for Care and Maintenance Operations. DPIR 2017</td>
<td>Once the C&amp;M Plan is developed it should be submitted to the DPIR and lodged as an amendment to the Mining Management Plan (MMP) for approval. The C&amp;M Plan requires detailed information regarding the management of water, weeds, feral animals, dust and fire management and other aspects as outlined in this structure guide.</td>
<td>NA</td>
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</tbody>
</table>
**QLD Policy – Content Analysis**

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<td>Mineral and Energy Resources (Financial Provisioning) Act 2018</td>
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**QLD Search for other grey literature**

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<tr>
<td>Queensland Audit Office. Follow-up of Report 15: 2013–14 Environmental regulation of the resources and waste industries Report 1: 2017–18</td>
<td>We also concluded that the two departments were not effectively managing financial assurances or mines that were in care and maintenance (mines that were not operating). This unnecessarily exposed the state to liabilities and the environment to harm. We made nine recommendations, all of which the two departments accepted. We recommended the departments improve data sharing and develop clearer guidelines and protocols when dealing with ‘care and maintenance’ sites. <strong>“</strong> establish clear definitions, guidelines, and formal protocols for dealing with the ongoing management of, and where necessary the transfer of responsibility for ‘care and maintenance’ sites. Recommendation fully implemented. <strong>“</strong> Managing care and maintenance sites. Both departments have worked collaboratively to define and document formal protocols on how they manage mines once in care and maintenance. They now define a mine as being in care and maintenance when the environmental authority holder is no longer operating the site to produce resources, but is maintaining the site, infrastructure, and equipment. Because the site is not producing resources, the operator does not pay royalties to the state, but it must pay rent and annual return fees. The risk of environmental harm remains. The original report also noted the lack of complete records kept by both departments on sites in care and maintenance. This resulted in limited oversight and inappropriate monitoring of these sites. Record keeping has improved but there is still no central record of all sites in care and maintenance. In future, the Department of Environment and Heritage Protection will record information on sites in care and maintenance in the Compliance and Risk Evaluation tool. <strong>“</strong> The Queensland Treasury Corporation issued its report in November 2016 and recommended the following reforms: (among other things) improving management of sites in care and maintenance. <strong>“</strong> The Department of Environment and Heritage Protection’s focus on risks relevant to rehabilitation includes: (among other things) assessing financial risk indicators such as why and when mines go into care and maintenance. <strong>“</strong> The Compliance Prioritisation Model prioritises sites for compliance activities by assessing and scoring 52 risk variables across three categories: environmental risk—each location is assigned a score based on the relevant environmental activity undertaken against the permit and baseline information on the environment type and consequence risk values § client risk—each entity is assigned a score based on data sources such as compliance history and outstanding fees or annual returns § location risk—each location is assigned a score based on data sources such as compliance level, compliance history, and operational status, such as sites in care and maintenance, to assess the compliance risk at specific locations. A total risk score is allocated to determine the inspection priority—bands 1–3. The aim of the Compliance Prioritisation Model is to target high-risk sites for inspection, placing sites with higher client, location or environmental risk in Band 1. Figure 3B shows the number of sites by priority band from July 2016 to March 2017. <strong>“</strong></td>
</tr>
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</table>
A cause of unsuccessful rehabilitation is the inability of the operators to meet the rehabilitation requirements which, in some cases, may be unachievable. This means some sites go into care and maintenance and a few operators forfeit the financial assurance to the state. As the financial assurance is often insufficient to cover the estimates cost of site rehabilitation, the state is left with an increasing legacy of sites that are not rehabilitated. There are a number of reasons why a mine might go into care and maintenance, such as changes in world commodity prices. It can also be used as a means of avoiding rehabilitation. There is no clear definition of care and maintenance sites and there are a lack of protocols between EHP and NRM about the management of these sites. This results in sites remaining in care and maintenance while the departments dispute over the administrative and regulatory responsibility for the site. There is no clear record of financial assurance held by the state because some assurance is held by NRM and some is held by EHP. Inadequate communication and processes between the two departments mean there is no reconciliation of records between the departments against funds held. At times, EHP staff did not know whether the financial assurance the required from an environmental authority holder had been requested, received or retained by NRM.

A 2007 review by the Service Delivery and Performance Commission found a lack of clarity of responsibilities and processes between public sector agencies for the transfer of sites to the NRM-administered Abandoned Mines Land Program (AMLPP). Despite recommendations made by the Commission in its report, there is still no clear definition about care and maintenance sites and no transparency on transfer of administrative responsibility for sites from EHP to the NRM - administered AMLPP. There is a lack of clear protocols between the two departments about the management of these sites. This results in sites remaining in care and maintenance while EHP and NRM dispute over the administrative and regulatory responsibility for the site.

A number of reasons, such as changes in world commodity prices, as to why a mine might go into care and maintenance. In some cases, particularly sites in care and maintenance for long periods, it may be the result of the expectations of full rehabilitation being unachievable and financially prohibitive and uses as a means of avoiding rehabilitation.

EHP advised that many of the level 1 sites would require up to 50 years of post-rehabilitation monitoring for successful rehabilitation before EHP can approve the surrender of the relevant environmental authority and return of financial assurance. It is unlikely that the government, operators and public were aware of this and the costs associated with the ongoing regulation of these sites.

Care and maintenance ‘Care and maintenance’ is a term used in the mining sector to describe the status of a non-operational mine site where there is potential to recommence works at a later date. The decision to move a site into care and maintenance is a major decision for a mining company with all potential impacts carefully evaluated. One factor influencing this decision may be low commodity prices, which are often cyclical. Under these circumstances, a company may choose to manage the site until economic conditions are favourable to recommence operations.

There has been concern expressed by some external stakeholders that care and maintenance equates with premature closure of a mine, however, this is not the case. It is important to recognise that under Queensland’s regulatory framework, although periods of care and maintenance may last several years, the ongoing environmental liability for the site, including rehabilitation, remains with the company. It is not relinquished until Government requirements have been met. Care and maintenance should also not be confused with abandonment, which is safe guarded by financial assurance mechanisms.

The existing regulatory framework is currently under review to better consider the definition and status of care and maintenance. QRC and its member companies are consulting with Government on proposed reform.

This is because C&M can be perceived to be a precursor to a company entering administration or liquidation.

### SA Policy – Content Analysis

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<td>If royalty payable on minerals recovered from a private mine is not paid on or by the day on which it fell due— (a) the Minister may, by written notice served on— (i) the proprietor of the mine; and (ii) if the Minister has given a notice under subsection (3)—the person carrying out mining operations at the private mine, make an order suspending mining operations at the mine; and</td>
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633—Closure, suspension or abandonment of mine (1) If the mine operator of a mine closes the mine, the mine operator must, at the time of the closure, ensure, so far as is reasonably practicable, that the mine is safe, including by being secure against unauthorised entry by any person. Maximum penalty: (a) in the case of an individual—$6 000; (b) in the case of a body corporate—$30 000. (2) If mining operations at a mine are suspended, the mine operator must ensure, so far as is reasonably practicable, that the mine is safe, including by being secure against unauthorised entry by any person, during the period of suspension. Maximum penalty: (a) in the case of an individual—$6 000; (b) in the case of a body corporate—$30 000.

140 Appeals (5) A notice of appeal does not operate as a stay of proceedings before the Mining Tribunal but the Supreme Court, on the application of any party, may make an order in respect of—
(a) the stay of proceedings; or
(b) the suspension of mining; or
(c) the appointment of receivers.

27. Notification of commencement of operations (1) The operator of a mine must notify the Chief Inspector of Mines before—(a) mining operations are commenced at the mine; and (b) mining operations are resumed after their suspension; and (c) mining operations are abandoned; and (d) mining operations are suspended. (4) The mine operator for a mine must ensure that the site senior officer—(a) has responsibility for mining operations and health and safety at the mine; and (b) is based in Tasmania at all times when the mine is operational; and (c) has sufficient authority and control over the mining operations to close or suspend operations, at the mine or in parts of the mine, that may expose employees to an unreasonable risk to their health or safety.
**Vic. Policy – Content Analysis**

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<td>Authorised Version No. 001 Environment Protection (Scheduled Premises) Regulations 2017 S.R. No. 45/2017 Authorised Version as at 25 June 2017</td>
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<td>Schedule 19: Guide - Statutory reporting for the mining industry Mineral Resources (Sustainable Development) (Mineral Industries) Regulations 2013 - Regulation 35 Annual Activity and Expenditure Return</td>
<td>in the &quot;Annual Activity and Expenditure Return&quot; form required under the &quot;Mineral Resources (Sustainable Development) (Mineral Industries) 2013 - Regulation 35 - Question 12.1 about the number of tailings dams in various states. Care and maintenance are given as a status option. There is no other reference to care and maintenance in this form.</td>
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| Statutory reporting for the mining industry. (Schedule 16: section 6.1) | (In reference to question 12.1 in explanatory notes) "care and maintenance refers to tailings dams into which no tailings material has been added during the reporting period, but where rehabilitation works have not yet commenced as the tailings dams may be utilised for tailings storage purposes again in the future."
| Regulating Stawell = http://earthresources.vic.gov.au/earth-resources-regulation/information-for-community-and-landholders/stawell-gold-mine/compliance-and-remedial-notices?SQ_ACTION=clear_design_name&full=true | ("Under Section 110 of MRSDA, ERR may issue a remedial notice to a licence holder who fails to comply with their licence conditions or provisions under MRSDA." In response to two licence condition issues the ERR assessment included the following assessment...) "However, given the decision to cease mining and processing at the site, ERR is satisfied that during care and maintenance the additional controls are no longer required. If mining and processing operations re-start, the directions given in this notice will be revisited."

**WA Policy – Content Analysis**

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<td>134. Powers of warden's court</td>
<td>(1) A warden's court has power to make orders on all matters within its jurisdiction, for — (j) the cessation or suspension by any party of any mining operations or works in connection therewith causing or likely to cause, injury to any other party, (f) the cessation or suspension at any time and from time to time of any mining operations or works, or the carrying on thereof under the direction or control of some person appointed by the warden’s court, for such period as seems necessary to the court.</td>
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<td>Mines Safety and Inspection Act 1994</td>
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<td>42. Commencement or suspension of mining to be notified</td>
<td>(1) The principal employer or the manager of a mine must, in accordance with the regulations, notify the district inspector for the region in which the mine is situated — (a) before mining operations are commenced at the mine; or (b) before mining operations are recommenced after their suspension; or (c) before mining operations are abandoned; or (d) before mining operations are suspended. (2) The principal employer or the manager must at the same time as giving notice under subsection (1) provide such evidence as is necessary to satisfy the district inspector for the region in which the mine is situated that the obligations under the Act as to commencement, recommencement, abandonment, or suspension of mining operations, as the case may require, have been complied with; and on receiving such a notice the district inspector must inspect the mine and verify the evidence provided with the notice and make a record accordingly. (3) A principal employer or manager must procure the approval in writing of the State mining engineer before mining operations are commenced at a mine. (4) A principal employer or manager who contravenes subsection (1), (2) or (3) commits an offence. (5) In this section, mining operations do not include exploration operations.</td>
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<tr>
<td>Mines Safety and Inspection Act 1994</td>
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<td>88. Plans of mine at its abandonment or suspension</td>
<td>(1) Where mining operations are about to be abandoned or suspended, the principal employer, or if a receiver has been appointed in respect of a principal employer, that receiver, or the manager must cause to be prepared to the satisfaction of the district inspector for the region in which the mine is situated an accurate plan or plans of the mining operations to the time of abandonment or discontinuance and must furnish that plan or those plans to the State mining engineer in accordance with the regulations before the mining operations are abandoned or suspended. (2) A principal employer, receiver, or manager who contravenes subsection (1) commits an offence.</td>
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89 (3) If mining operations are abandoned or suspended, the principal employer at the mine at that time must keep all record books and log books that have been kept under this Act in respect of the mine for a period of 6 years from the time of abandonment or suspension; and if the principal employer appears likely to go into liquidation or receivership must take steps to ensure that such record books and log books are safely kept for that period.

104 (1) The Governor may make regulations prescribing all matters that are required or permitted by this Act to be prescribed, or are necessary or convenient to be prescribed, for achieving the objects and giving effect to the purposes of this Act, and in particular—

(a) prescribing the measures which must be taken before mining operations are suspended and during any period of suspension or before a mine is closed or abandoned and after closure or abandonment;

3.12. General details to be included in notification Each notification must include the following details—

(d) what mining operations are to be affected, and whether they are to be commenced, recommenced, abandoned or suspended; and

(e) the date on which the mining operations are to be commenced, recommenced, abandoned or suspended (as the case may be).

3.14. Details to be included in notification of suspension Notification of the suspension of mining operations at a mine must, in addition to the details set out in regulation 3.12, include the following details—

(a) the reason for the suspension and the planned duration of the suspension; and

(b) whether the closure is total or whether access to underground and/or open pit workings is to be maintained; and

(c) if underground and/or open pit access is to be maintained, details of the arrangements that have been made for the provision of regular services and emergency services to ensure the safety of employees engaged in maintaining the mine; and

(d) the measures that have been taken to...
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<td>Identification, reporting and classification of contaminated sites in Western Australia Contaminated Sites Guidelines. June 2017.</td>
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<td>Requirements for Mandatory Auditors' Reports. Contaminated Sites Guidelines. November 2016</td>
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<td>The Western Australian Contaminated Sites Auditor Scheme. Contaminated Sites Guidelines November 2016</td>
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When the decision is made to place a mine on care and maintenance (C&M), it has to be recognised that there are still ongoing environmental obligations to be met. The commitments made in any Notice of Intent (NOI) or Annual Environmental Report (AER) which have subsequently been imposed as conditions on the relevant tenement/s, still apply and if not complied with may put the tenement/s at risk of forfeiture action. Furthermore, relevant sections of the Mining Act 1978 and Mining Regulation 1981 apply.

It is therefore necessary to have in place a care and maintenance plan not only for the plant and equipment on site but also for the management of all environmental aspects of the site during this phase. It is also essential that public safety is considered during the C&M phase.
As early as possible after the decision is made to place a site on care and maintenance, an environmental audit of the site should be carried out. This will establish the status of all landforms and infrastructure with respect to the environmental risk of each element during the expected period of C&M. If this time is not known, then for the next two years as a minimum. From this audit, a plan can be developed to manage/ameliorate the environmental risks identified.

The following outlines some aspects of mining operations that need to be considered. This is not intended to be a complete coverage of all potential environmental risks. Each site will be unique and may have other aspects that need to be considered when going onto C&M. Once the C&M plan is developed it should be submitted to the Department of Mines and Petroleum (DMP) for our information.

There are two main environmental risks from unrehabilitated, or partly rehabilitated waste rock dumps. These are dispersal of dump material to the surrounding environment as a result of erosion; and pollution of the surrounding environment as a result of chemicals or other materials coming from the dump. Severe erosion of dumps can disperse large quantities of material that may affect surrounding vegetation and habitat, block natural drainage lines and interfere with the operations of other land users in the area. Dumps may contain a number of chemicals that could be mobilised over time and pollute ground or surface waters and cause damage to vegetation and habitat.

Tailings storage facilities have the same potential risks as waste dumps, with the added risks of release of liquor from the facility or in the worst case, catastrophic failure of the facility. There is potential for release of liquor from the facility as seepage through the containment walls, directly into the ground water through the base of the facility, through over-topping of the facility and through any under drainage or gravity out-fall from the decant pond. A catastrophic event can occur as a result of failure of a containing wall (especially in a facility with unconsolidated tailings), through a structural weakness in the wall because of a design or construction fault, or erosion of the wall, particularly through over-topping in the event of heavy rainfall.

At the time of shut down, treatment plants will contain significant volumes of process-related materials and chemicals. If these are not stored or disposed of correctly, they may disperse outside the plant area and have an adverse effect on the environment.

Most mines store significant quantities of various chemicals, fuels, oils and greases including used chemicals, oils and greases. If not stored in appropriate containers or disposed of correctly, these can disperse and cause harm to the environment, through damage to vegetation or ground and surface waters.

If appropriate bunding or other surface drainage structures are not in place at the time of placing an open-pit operation on C&M, there is a possibility that significant surface water flows will make their way into the open pit. The pit then acts as a storage dam depriving vegetation system downstream of their normal supply of water from surface drainage following rainfall events. Pits may fill with saline or low pH water during C&M. This may not be a problem during C&M, but disposal of this water if and when the operation recommences, may pose environmental problems.
As for open pits, openings to underground workings such as shafts and decline portals may act as drainage pathways to underground workings thus depriving downstream vegetation of normal water supply. If mining is recommenced, the disposal of any water from flooded underground workings may pose an environmental problem.

Natural and engineered drainage structures around the mine site may become ineffective due to erosion, sedimentation or other factors. This can lead to severe erosion of the natural land surface, or the erosion of constructed landforms such as waste dumps or tailings facilities.

Regular environmental monitoring carried out during operations should generally continue through the C&M stage. Extra monitoring may need to be carried out, especially to determine stability of structures that may be prone to erosion. Establish a regular inspection regime carried out by competent persons. Results of all monitoring and inspections should be recorded in writing and analysed by qualified people.

It is important that there is an emergency response action plan in place with clear lines of communication. Any adverse findings during inspections or monitoring that may lead to serious environmental harm must be dealt with in a timely manner. If a catastrophic event does occur, it is essential that there is a plan in place to minimise injury and damage.

Regular reporting to DMP and other government agencies carried out during operations will need to be continued through the C&M stage. Any environmental incidents and potential major incidents should be reported at the time of occurrence/discovery.

Mining operations may be forced to close prematurely. This may be permanent or "suspended operations under care and maintenance". In these circumstances, mine operators need to take into account the safety obligations required under sections 42 and 88 of the Mines Safety and Inspection Act 1994 relating to mine suspension or abandonment. One of those obligations is to notify the relevant District Inspector for the Resources Safety Division of DMP before a mining operation is suspended or abandoned.

The description of the closure work programs, usually referred to as "closure task register", should include but not be limited to the following information: Key tasks for premature closure...

Phase following temporary cessation of mining operations where infrastructure remains intact and the site continues to be managed. All mining operations suspended, site being maintained and monitored.

2.8... Mine operators also need to take into account the safety obligations required under sections 42 and 88 of the Mines Safety and Inspection Act 1994, relating to mine suspension or abandonment.
4.12.3 Although practical planning for premature closure (permanent or suspended operations under care and maintenance) may not be done in detail in the early stages of the project, consideration must be given in the Mine Closure Plans for how a proponent plans to deal with these closure scenarios which may arise from economic, environmental, safety or other external pressures. In particular, this should include confirmation that appropriate materials are available on site and contingencies are provided to make landforms such as tailings storage facilities and waste dumps secure and non-polluting in the event of premature closure. In such an event, an accelerated closure process will need to be implemented (section 2.7).

Operators must contact the relevant Environmental Officers at DMP and DER as early as possible for advice on site-specific requirements in the event of these closures. If a systematic closure plan is in place, the operation will be well placed to respond (DEH 2002). Proponents should be aware they are required to notify the district inspector of mines of the suspension of a mining operation under the Mines Safety Inspection Act 1994. DMP expects that for partial closure, caretaker personnel are maintained at the site. For total closure the site should be secured and signposted using sufficient measures to prevent inadvertent entry. Additional requirements with respect to the isolation of services, removal of explosives, chemicals, hazardous materials, plant and/or buildings may be applicable depending upon the mine status and/or duration of the closure and underground access and management of subsidence would need to be addressed. DMP has provided four template documents on the DMP webpage for commencement, suspension, recommencement and abandonment.

| WA Guidelines for Preparing Mine Closure Plans May 2015 | Care and maintenance: Phase following temporary cessation of mining operations where infrastructure remains intact and the site continues to be managed. All mining operations suspended, site being maintained and monitored. | see B73 | NA | see B73 | NA | NA | see B73 | NA | NA |
Appendix 2 Content Analysis of Submissions and Final Report of the Senate Standing Committees on Environment and Communications 2017 Inquiry Rehabilitation of mining and resources projects as it relates to Commonwealth responsibilities

Review of submissions

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<th>Submitter</th>
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<th>temporary</th>
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<td>Financial assurances are inadequate. Mining companies consistently underestimate costs associated with rehabilitation, and when the mine is no longer financially viable, it is easier to put it into care and maintenance, declare bankruptcy, or simply walk away. A more recent strategy is to sell off to a ‘minor miner’ and avoid any rehabilitation responsibilities, as in the case of Rio Tinto selling the Blair Athol coal mine to Terracor for $1.00. State Governments have not protected the public interest, neither for environmental restoration or financial responsibility which will ultimately fall to the taxpayer. State governments continue to approve mine closure plans that that leave a final void. That mine owners of operational mines that are also owners of abandoned mines, or mines that are in care and maintenance, or that have not been operational for a defined period (rehabilitation must commence within 2 years of when the area becomes available) be compelled to rehabilitate these mines or risk losing approvals for the mines still in operation. The miners are making billions of dollars profit and must fulfil their obligations for extracting our resources, and they must clean up their mess. That a proper definition be applied to ‘care and maintenance’, and that it be time limited (2 years).</td>
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<td>That Commonwealth responsibilities for rehabilitation of mines be extended to the care and maintenance phase of mine closure, as examples of negative health impacts have occurred after mining has stopped but before rehabilitation has commenced. Lack of research and monitoring. There is a paucity of data on aspects of mine rehabilitation such as base line studies, long term monitoring, Health Impact Assessments or community consultation, and if any such data has been collected, it is not publicly available. DEA could not find any health statistics on people working or living near mines in the care and maintenance phase, or mines that have been rehabilitated or abandoned. Care and maintenance phase: Many mines in Australia are in the care and maintenance phase, during which production is stopped. The site is required to be managed to ensure it remains in a safe and stable condition, but there is no requirement for rehabilitation. For example, in New South Wales (NSW), 123 mines are in the care and maintenance phase, and 112 are considered abandoned. Only one mine in NSW has been fully rehabilitated and relinquished in the past 10 years.2 While this enquiry asks for comments on the rehabilitation of mining and resources projects, adverse health impacts are arising during the care and maintenance phase and before the rehabilitation phase of the mine has begun. Two examples of failures of management during the care and maintenance phase have occurred with severe impacts on human health. The first example is the 2014 fire at the Morwell coal mine in the Latrobe Valley. An old part of the mine no longer in operation had not been adequately protected from fire hazard, unlike active sections of the mine. The open and unprotected coal face was set alight by burning embers from a nearby bushfire. The resultant fire on the coal face burnt for 45 days and affected thousands of nearby residents. The severe air pollution from the fire, which included particulate matter (PM10 and PM2.5), CO, and other airborne pollutants and toxins was implicated in short-term negative health impacts such as respiratory illnesses, increased risk of heart attack and stroke. Long-term health impacts similar to those found from exposure to air pollution are expected.3 The second example of health impacts during the care and maintenance phase of an inoperative mine is Linc Energy’s in Situ Coal Gasification (ISCG) project at Hopeland, near Chinchilla in Queensland. The project, which ceased in 2013, is alleged to have contaminated 314 km2 of farming lands in the surrounding area, and farmers have been banned from digging deeper than 2 metres into the soil because of a flammability risk.</td>
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<td>In arguing the case, amongst other things, State Delegates agreed that governments’ must shut care and maintenance mines and ensure that all mine sites are rehabilitated and paid for by the miners - including the infilling of mine voids and replication of original land contours.</td>
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<td>That Commonwealth responsibilities for rehabilitation of mines be extended to the care and maintenance phase of mine closure, as examples of negative health impacts have occurred after mining has stopped but before rehabilitation has commenced. Lack of research and monitoring. There is a paucity of data on aspects of mine rehabilitation such as base line studies, long term monitoring, Health Impact Assessments or community consultation, and if any such data has been collected, it is not publicly available. DEA could not find any health statistics on people working or living near mines in the care and maintenance phase, or mines that have been rehabilitated or abandoned. Care and maintenance phase: Many mines in Australia are in the care and maintenance phase, during which production is stopped. The site is required to be managed to ensure it remains in a safe and stable condition, but there is no requirement for rehabilitation. For example, in New South Wales (NSW), 123 mines are in the care and maintenance phase, and 112 are considered abandoned. Only one mine in NSW has been fully rehabilitated and relinquished in the past 10 years.2 While this enquiry asks for comments on the rehabilitation of mining and resources projects, adverse health impacts are arising during the care and maintenance phase and before the rehabilitation phase of the mine has begun. Two examples of failures of management during the care and maintenance phase have occurred with severe impacts on human health. The first example is the 2014 fire at the Morwell coal mine in the Latrobe Valley. An old part of the mine no longer in operation had not been adequately protected from fire hazard, unlike active sections of the mine. The open and unprotected coal face was set alight by burning embers from a nearby bushfire. The resultant fire on the coal face burnt for 45 days and affected thousands of nearby residents. The severe air pollution from the fire, which included particulate matter (PM10 and PM2.5), CO, and other airborne pollutants and toxins was implicated in short-term negative health impacts such as respiratory illnesses, increased risk of heart attack and stroke. Long-term health impacts similar to those found from exposure to air pollution are expected.3 The second example of health impacts during the care and maintenance phase of an inoperative mine is Linc Energy’s in Situ Coal Gasification (ISCG) project at Hopeland, near Chinchilla in Queensland. The project, which ceased in 2013, is alleged to have contaminated 314 km2 of farming lands in the surrounding area, and farmers have been banned from digging deeper than 2 metres into the soil because of a flammability risk.</td>
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<td>Closing loopholes that allow indefinite ‘care and maintenance’. Equally bringing mines out of care and maintenance into closure and rehabilitation could deliver hundreds of jobs such as Central Queensland where according to the Department of Natural resources and Mines there are six open cut coal mines in care and maintenance. 24 Rehabilitating these require a significant investment in plant, equipment and people given all these sites have low rates of progressive rehabilitation meaning the majority of these sites remain in a condition requiring significant earthworks and other physical works to complete the final landforms. The spin offs or multiplier effects of an investment in rehabilitating mines in maintenance in Central Queensland and elsewhere will deliver thousands of jobs and billions of dollars worth of investment in rural and regional Australia over the decades required to rehabilitate these sites. loopholes that allow indefinite ‘care and maintenance’ and sale to minnows must be closed - Strictly limit ‘care and maintenance’ and put in place strict financial requirements and standards to prevent sale of mines to minnows who do not have capacity to undertake full rehabilitation.</td>
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<td>Recent research published by The Australia Institute indicates that, in New South Wales, there have been almost no relinquishments of mining leases that show mining is totally concluded and the site fully available for other purposes. Most mine sites not in active production tend to be placed on “care and maintenance”</td>
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<td>13 The Australia Institute</td>
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<td>Most states’ mining departments do not publish detailed estimates of how many mines are operating in the state. Australia has somewhere between 460 and 2,944 mines currently operating according to government estimates. Little data is published on mines in care and maintenance. Official estimates aggregate to between 206 and 972 mines in care and maintenance across Australia. Still less information is available on mines undergoing final closure. Data from Tasmania and examples from other states sum to 8 mines that have begun final closure in the last ten years.</td>
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Of concern in every state and territory is that mines can avoid or delay rehabilitation responsibilities by entering an indefinite, and often undefined, ‘care and maintenance’ mode. Responsibilities during ‘care and maintenance’ tend to relate to keeping a site safe and stable and avoid any need to undertake progressive or meaningful rehabilitation. A decision to enter ‘care and maintenance’ can occur with no need for the proponent to provide certainty as to when they will recommence operations or close and rehabilitate the mine. Reference the Queensland Audit Generals report. Close loopholes that allow indefinite ‘care and maintenance’ status for mines, and the sale of mines and resource projects to small companies ill-equipped to undertake rehabilitation.
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<td>Our concerns are on the time limits on the Chain-of-Responsibility legislation given the long life of mines and the ability for mines to be placed into care and maintenance. We invite the Committee to review EJA’s publication Dodging clean-up costs: six tricks mining companies play (copy attached) as background to how and why companies avoid rehabilitation costs. We CARE AN O MAINTENANCE This is the term for putting a coal mine in mothballs. It’s on the spectrum somewhere between digging and closing down. At least one private law firm acknowledges that it is ‘not surprising’ that companies are placing mines into care and maintenance in the current economic climate.8 When a mine is in care and maintenance, its operator ostensibly waits for the saleable price of its product to increase so the mine can start producing again. As such, the mine does not need to be rehabilitated and future costs stay off the balance sheet. In Queensland, the term ‘care and maintenance’ is not defined in legislation.9 A mine could be in care and maintenance in perpetuity, or until the mining company goes bankrupt.10 The Queensland Audit Office (2014) recognised that government responsibility for mines in care and maintenance is unclear which has led to inter-departmental disputes.11 The company controls whether the site is in ‘care and maintenance’ and those sites appear to be handled by the Department of Natural Resources and Mines. Environmentally speaking, the only requirement is to comply with ‘care and maintenance’ provisions. Thus, it appears difficult for the government push mines from ‘care and maintenance’ into rehabilitation.12 As at July 2013 in Queensland some 104 mines were in care and maintenance.13 In contrast, approximately 60 large-scale coal mines were in operation14 and between 15,000 and 17,000 mines of all types had been ‘abandoned’ in Queensland.15 There are approximately 50,000 abandoned mines in Australia.16 The functions of the NMRC and Commissioner would appear to be to investigate and report on: - the status of all mines in each jurisdiction (i.e. in use, mothballed, abandoned);</td>
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<td>At the same time, there are a range of strategies that corporations use to avoid their rehabilitation liabilities, including letting mines sit idle in ‘care and maintenance’, offloading mines with rehabilitation liabilities to smaller players and putting operations into liquidation.4 There needs to be defining principle of our national environmental law that specifies that polluting companies must internalise the environmental and social costs of their business and clean up and compensate for the environmental harm that arises from their activity, as presently no such provision exists. Reference the Queensland Audit Generals report. A particular concern to ACF is the current status of Paladin Energy’s Kayelekera mine in Malawi. Production was suspended at this controversial operation in 2014 and the project remains in extended care and maintenance. Local community groups and national civil society organisations have raised concerns over the continuing impacts of the mine and the company has declined requests by Australian non-government organisations to discuss the operation and related concerns. ACF urges the Committee to examine the status of rehabilitation works and environmental impacts at this operation and the wider adequacy of the regulatory framework and compliance of Australian uranium companies operating outside Australian jurisdiction.</td>
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| 31 Dr Jason Tuckwell | NA | NA | NA | NA | YES | NA | What appears to be the dominant issue, is the profound lack of data on the state of current rehabilitation of existing or ‘suspended’ mines. This lack of data and transparency, a key determinate for the Senate enquiries terms of reference, forms the principle finding of the Australia Institute’s preliminary investigation, The Dark Side of the Boom. ([http://www.tai.org.au/sites/default/files/P19%20Dark%20side%20of%20the%20boom%20-%20SW%20FINAL.pdf](http://www.tai.org.au/sites/default/files/P19%20Dark%20side%20of%20the%20boom%20-%20SW%20FINAL.pdf)) Moreover against this opacity, is the demonstrable ability of the mining industry to perform...
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<td>42 Friends of Big Hill Stawell</td>
<td>YES</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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<td>43 Mineral Policy Institute</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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<td>44 Western Australian Government</td>
<td>NA</td>
<td>NA</td>
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1) Improve the management of site rehabilitation by the following means: a) Determine the fates of all rehabilitation recommendations made in past major government reports, analyse those not fully implemented, recommend which of these deserve renewed scrutiny and publicly release the resulting report. b) Mandate staged rehabilitation for all sites still the responsibility of their operators. This would end the practice of operators avoiding their site rehabilitation obligations by delaying site rehabilitation until final closure and then never closing the site, but instead consigning the site to the limbo of indefinite ‘care and maintenance’. Have a single government agency regulate the environmental performance on all extractive sites (exploratory-phase, active, ‘care and maintenance’, recently closed and abandoned) and use any relevant regulatory powers that it has to maximise the magnitude and quality of any rehabilitation. Note that this regulation would extend from the capping of exploration drill-holes to long term monitoring of rehabilitated sites (as some problems such as slumpng, and ground-water contamination may not become apparent until after rehabilitation has been signed-off as successfully completed). (attachment to submission) OPERATIONAL SITES Operational sites are sites where the site operator still has legal responsibilities. Such sites include ‘care-and-maintenance’ sites (where active resource extraction has been suspended and may later resume), sites in their closure stage, even post-closure sites (where long-term site monitoring or continuing treatment may be required). QAO (2013-14) (attachment to submission) If rehabilitation is delayed until after closure, there is the incentive never to formally close the site at all, but instead consign it (and its unfulfilled rehabilitation obligations) to the indefinite limbo of ‘care and maintenance’. A site is in ‘care and maintenance’ if the environmental authority holder is no longer operating the site to produce resources, but is maintaining the site, infrastructure and equipment. A site may go into ‘care and maintenance’, because of a temporary downturn in world commodity prices. However, in some cases, particularly sites in care and maintenance for long periods, the operator may believe that full rehabilitation is unachievable or financially prohibitive and that indefinite ‘care and maintenance’ status can be used to indefinitely avoid rehabilitation (QAO, 2013-14). With continuing delay in even starting the rehabilitation process, there is also the continuing risk of bankruptcy and the transfer of rehabilitation obligations to government – or of operators convincing a government-of-the-day that it is now ‘unreasonable’ to have onerous rehabilitation obligations fulfilled. Dr. Enskine of the CMLR asserts that ‘The Government doesn’t want to take on the risk of a closed mine and the industry is reluctant to spend the money required to safely close the mine.’ Instead, what we see are mines placed into care and maintenance, where the mining companies can avoid paying out rehabilitation bonds, because the mine isn’t officially closed (Australian Broadcasting Corporation, 2015a).

Mines are allowed to be abandoned without rehabilitation if deemed under “Care and Maintenance” with the same consequences as above “Care and Maintenance” is used as a means of side-stepping rehabilitation responsibility and condoned by NSW Planning.

Mining companies are avoiding clean up costs by divesting obligations, downgrading the mine to an artificial ‘care and maintenance’, extracting until the company makes a loss, actively choosing not to rehabilitate the land, and applying for a discount on their financial assurance (West, M. 2016). It appears to be optimal for mining companies to delay rehabilitation under the current regime; and this was further reinforced by my paper. Ultimately, the taxpayers are bearing the risk and ultimate cost. Similarly, the Frances Creek Mine owned by Territory Ore is being downgraded to ‘care and maintenance’ as the price of Iron Ore has dropped. However, the rock walls of the pits are made of carbonaceous shale, which can cause acidification when it reacts with water. As the pit slowly fills with water, modelling suggests that it will spill after 2022 (Fitzgerald, 2016).

Hypothesis 3 Referring back to the Germany case study, old workings of operational (or care and maintenance) underground coal mines could be used to help facilitate not only the generation of power but assist in the issue of the dewatering of these workings by using pumped-storage hydroelectric technology. The progressive rehabilitation programs could include areas for solar farms. Solar panels could be installed on to existing built infrastructure including dedicated haul roads. Furthermore, for those abandoned mines or mines in care and maintenance (mines whereby the environmental holders are unable to meet rehabilitation costs present as a high risk of being abandoned) there is insufficient financial assurance held by the states departments to cover the cost of remediation or rehabilitation. 32

SGM is currently owned by a Canadian company Kirkland Lake Gold and since December 2016 the operations have been placed in a self-imposed “care and maintenance” status even though the MDRSA Act (1990) does not recognise this status. The total SGM bond is $6.1 million dollars. Kirkland Lake Gold has advised its board that SGM will require $9.8 million each consecutive year for “care and maintenance”.

185
| 45 Australian Tyre Recyclers Association | NA | NA | NA | NA | NA | NA |
| 46 Maules Creek Community Council Inc | NA | NA | NA | NA | NA | NA |
| 47 Peabody Energy | NA | NA | NA | NA | NA | NA |
| 48 Rio Tinto | NA | NA | NA | NA | NA | NA |
| 49 NSW Minerals Council (NSWMC) | NA | NA | NA | NA | NA | NA |
| 50 Minerals Council of Australia | YES | YES | NA | NA | NA | NA |
| 51 Mr Gary Reed | NA | NA | NA | NA | NA | NA |
| 52 Mr Phillip Spark | NA | NA | NA | NA | NA | NA |
| 53 Northern Territory Government | NA | NA | NA | NA | NA | NA |
| 54 BHP Billiton | NA | NA | NA | NA | NA | NA |
| 55 Department of Industry, Innovation and Science | NA | NA | NA | NA | NA | NA |
| 56 East Kimberley Chamber of Commerce and Industry | NA | NA | NA | NA | NA | NA |
| 57 Glencore | NA | NA | NA | NA | NA | NA |
| 58 South Australian Government | NA | NA | NA | NA | NA | NA |
| 59 Mr Frank Hooke | NA | NA | NA | NA | NA | NA |
| 60 Ms Vanessa Richardson | NA | NA | NA | NA | NA | NA |
| 61 Mr Jim Leggate | NA | NA | NA | NA | NA | NA |
| 62 Mr Chris Bilsland | NA | NA | NA | NA | NA | NA |
| 63 Ms Wies Schuiringa | NA | NA | NA | NA | NA | NA |
| 64 ARC Centre for Mine Site Restoration | NA | NA | NA | NA | NA | NA |
| 65 Mr Volker Pfannenberg | NA | NA | NA | NA | NA | NA |
| 66 Mr Robert Kent | NA | NA | NA | NA | NA | NA |
| 67 Government of Victoria | Yes | NA | NA | NA | NA | NA |

B.7. Care and maintenance

In some cases, mining companies may choose to place a mine into care and maintenance. The decision to move a site into care and maintenance is a major decision for a mining company with all potential impacts carefully evaluated. One factor influencing this decision may be low commodity prices – which are often cyclical. Under these circumstances, a company may choose to manage the site until economic conditions are favourable to recommence operations. Care and maintenance should not be confused with premature closure of a mine. Periods of care and maintenance may last several years. However, in both care and maintenance and premature closure, the ongoing liability for the site remains with the mining lease holder – it is not relinquished until government requirements have been met. Care and maintenance should also not be confused with abandonment, which is safe guarded by financial assurance mechanisms.

Sites which are abandoned from 1990 onward fall under the responsibility of ERR in accordance with the MR(SD) Act. The abandoned Benambra Mine in East Gippsland, Victoria, was successfully rehabilitated by ERR in the early 2000s at a cost of approximately $6 million to the State. The Benambra mine was abandoned in July 1996 when the operator went into administration. The mine was placed into care and maintenance, managed initially by the Administrator and later by DEDJTR (formerly the Department of Primary Industries).
<table>
<thead>
<tr>
<th>Code</th>
<th>Organisation</th>
<th>Key Points</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>Government of Tasmania</td>
<td>YES NA NA NA NA NA Mines in Care and Maintenance (T or f?) A number of mines have entered 'care and maintenance' in Tasmania in recent years. The principal driver for this approach has been lower commodity prices that impact on an operation's financial profitability. Of the eight mines on care and maintenance in 2015, one has since restarted, another has sought new markets through a successful R&amp;D program, three have commenced refurbishment works for restart, another is entering closure phase, and two remain in care and maintenance. Where a mine temporarily ceases operation, a Care and Maintenance Plan (CMP) must be submitted for approval by the Director of the EPA. The CMP outlines how the mine will be maintained while not in operation. Being in care and maintenance does not release a mine operator from rehabilitation obligations. In fact, there are examples in Tasmania where significant progressive rehabilitation has been earned out during care and maintenance, an activity that the Government encourages. It should also be noted that there is no implication that any mines in Tasmania are entering care and maintenance as a means of avoiding their rehabilitation obligations.</td>
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<tr>
<td>69</td>
<td>Mr Peter Coggins</td>
<td>YES NA NA NA NA NA With the closure of the Kandos Cement Works in late 2011, the Car A mining lease is not required for a site on which road base is made. It is, however, in the interests of Kandos to maintain CML12. If it surrendered the lease or was required to surrender the lease on the grounds that the mine has been on a care and maintenance for an excessive period and there is no commitment to resume mining, it would face the cost of rehabilitating the mine site. Well Creek Mine ceased to operate and officially went into, and remains, on a care and maintenance basis. We are advised that the NSW Department of Industry has a policy of allowing mines to be on a care and maintenance basis for a maximum of two years. This mine, however, has now been on care and maintenance for over five years and we understand this is not an unusual situation. There are no royalties payable to Governments from a mine on extended care and maintenance but Governments are keen to foster a climate favourable to mining and mining companies and are accordingly prepared to allow mines to remain on care and maintenance well past the official maximum of two years, even when resumption of mining becomes extremely unlikely and avoidance of the cost of rehabilitation is clearly the motive for not terminating a mining lease. We are concerned that Kandos will attempt to keep the Carwell Creek Mine on never ending care and maintenance... Consider the practice of putting mines on extended care and maintenance as a means to defer and ultimately avoid the cost of rehabilitation. (We suggest that that regulators set a two year maximum period for a mine to be on care and maintenance, permitting longer periods only when there is a contracted commitment to a resumption of mining with an absolute maximum of ten years for any mine to be on care and maintenance).</td>
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<tr>
<td>70</td>
<td>- name withheld</td>
<td>NA NA NA NA NA NA</td>
<td></td>
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<tr>
<td>71</td>
<td>Bendigo and District Environmental Council</td>
<td>NA NA NA NA NA NA</td>
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<tr>
<td>72</td>
<td>Mr Andrew Helps</td>
<td>YES NA NA NA NA NA Stawell Gold mine - currently under care and maintenance. This mine has no EPBC permit as it was in operation prior to the introduction of the EPBC Act. Since 1966, I have never seen a properly remediated end of life mine in Victoria. The common practice is to put a mine on &quot;care and maintenance&quot; and then look to divert the asset during the next peaking of the mining cycle. It is important to note the very long mine life of the very rich mines such as Broken Hill, and Kalgoorlie.</td>
<td></td>
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<tr>
<td>73</td>
<td>Mr Wayne Hamilton</td>
<td>NA NA NA NA NA NA The NOAMI mining occurrence hierarchy (NOAMI, 2004) was also adapted to include Heritage and Care and Maintenance sites (Figure 1). The one care and maintenance site was found though self-research. Because a neglected site has not been terminated it can be assumed that there has been little to no rehabilitation... 'Care and maintenance' sites were also included in the NOAMI mining occurrence hierarchy (Miller, Northe &amp; Yellishetty, 2017). Although, mines under care and maintenance typically undergo progressive rehabilitation, our analysis included them under 'in-active' to highlight their future rehabilitation need... It would be prudent for future research, to remove bias from the reporting process by assuming that only mining occurrences in active mining are active and all occurrences outside the boundaries of current leases should initially be considered as neglected. In practice, mining can cease in one area and continue in an other. Consequently, neglected sites could be reclassified as 'terminated' or care and maintenance with further research. Similarly, active sites could revert to inactive with more updated information. Nevertheless, for this report the inactive mines identified theoretically represent a larger group of which the derelict mine sites of the DMP are a subset... According to the Audit Office report into rehabilitation security deposits (2017), 86 of approximately 450 sites are in care and maintenance but of 105 mines classed as state significant, 12 are in care and maintenance... The Mine Atlas divides the mining occurrences into three categories which are defined as follows: 1. Operating mine: currently in operation (does not include those in care and maintenance) 2. Historic mine: ceased to operate and is unlikely to operate in the future (includes neglected sites). Heritage listing is not taken into consideration, so it cannot be confirmed whether heritage listed sites are included in this category. 3. Mineral deposit: undeveloped deposit identified through invasive techniques such as drilling.</td>
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<tr>
<td>74</td>
<td>Monash University</td>
<td>YES NA NA NA NA NA The NOAMI mining occurrence hierarchy (NOAMI, 2004) was also adapted to include Heritage and Care and Maintenance sites (Figure 1). The one care and maintenance site was found though self-research. Because a neglected site has not been terminated it can be assumed that there has been little to no rehabilitation... 'Care and maintenance' sites were also included in the NOAMI mining occurrence hierarchy (Miller, Northe &amp; Yellishetty, 2017). Although, mines under care and maintenance typically undergo progressive rehabilitation, our analysis included them under 'in-active' to highlight their future rehabilitation need... It would be prudent for future research, to remove bias from the reporting process by assuming that only mining occurrences in active mining are active and all occurrences outside the boundaries of current leases should initially be considered as neglected. In practice, mining can cease in one area and continue in an other. Consequently, neglected sites could be reclassified as 'terminated' or care and maintenance with further research. Similarly, active sites could revert to inactive with more updated information. Nevertheless, for this report the inactive mines identified theoretically represent a larger group of which the derelict mine sites of the DMP are a subset... According to the Audit Office report into rehabilitation security deposits (2017), 86 of approximately 450 sites are in care and maintenance but of 105 mines classed as state significant, 12 are in care and maintenance... The Mine Atlas divides the mining occurrences into three categories which are defined as follows: 1. Operating mine: currently in operation (does not include those in care and maintenance) 2. Historic mine: ceased to operate and is unlikely to operate in the future (includes neglected sites). Heritage listing is not taken into consideration, so it cannot be confirmed whether heritage listed sites are included in this category. 3. Mineral deposit: undeveloped deposit identified through invasive techniques such as drilling.</td>
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<td>75</td>
<td>Mr Frank Batini</td>
<td>NA NA NA NA NA NA</td>
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<td>76</td>
<td>Bushwalking WA</td>
<td>NA NA NA NA NA NA</td>
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<td>77</td>
<td>Mr Harley Lacy</td>
<td>NA NA YES NA NA NA</td>
<td>Without the legislative capacity to capture past corporate ownership of a mine site i.e. transfer liabilities via sale and through a chain of future failed companies, trade to the point of premature closure, become bankrupt, etc. many of the State's financial mechanisms to ensure a reduction in the risk of unplanned closure, will I believe, tend to be inadequate to the task ahead, and to address those of the past, without massive capital injections from the Commonwealth.</td>
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<td>78</td>
<td>Ash Development Association of Australia (ADAA)</td>
<td>NA NA NA NA NA NA</td>
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<td>79</td>
<td>Australian Energy Council</td>
<td>NA NA NA NA NA NA</td>
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<tr>
<td>80</td>
<td>Mr David Watkins</td>
<td>NA NA NA (in relation to C&amp;M) NA NA NA NA</td>
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In this latter regard, we note troubling trends documented in other submissions to the Inquiry, including asset transfers and mines being held indefinitely in “care and maintenance” as a way to avoid rehabilitation...One of our main concerns is the very long term, and indeed in some cases perpetual, care and maintenance required for some mine sites on Aboriginal land, and the apparent failure to regulate for the governance and financing of this care.

Wagners have conducted successful trials with stockpiled ash stored at the mothballed Swanbank B power station (near Ipswich, Qld).

In 2012, the Playford power station was mothballed.

Out of 93 submissions there were 56 group submissions and 37 individual submissions. Out of 56 group submissions 18 mention C&M. Out of 37 individual submissions 10 mention C&M. Out of the 18 groups submissions that mention C&M – 10 were environment groups (3 local env groups/ 1 a state peak env group /6 national groups) - 2 were state government and another -2 were mining industry groups - 1 was from a university – 1 from a union – 1 from a think tank – 1 from a women’s group.

<table>
<thead>
<tr>
<th>type of group</th>
<th>C&amp;M define or describe y/na</th>
<th>C&amp;M as a problem y/na</th>
<th>C&amp;M prob rehab</th>
<th>C&amp;M regulation fix</th>
<th>C&amp;M prob time</th>
<th>C&amp;M prob bankruptcy/sell offs</th>
<th>C&amp;M health</th>
<th>referenc e a site</th>
<th>reference QLD Audit</th>
<th>links C&amp;M to bonds</th>
<th>links C&amp;M to adequate bonds</th>
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<td>envi</td>
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<td>envi + health</td>
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Content Analysis of C&M mentions in Senate Inquiry Submissions
Of the 18 group submissions - 9 talk about C&M in relation to mine rehabilitation - 8 of those identify that C&M is a problem for rehabilitation.

7 submissions reference at least one specific site in C&M - 3 of them are just descriptive of those specific sites, 4 identify specific C&M sites as a problem.

6 submissions identify that there is no time limit for how long a mine can be in C&M / 5 submission advocate for specific regulatory fixes – four of those advocate for limits on the time sites can be in C&M.

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**Final Senate Committee Report – all Mentions of C&M**

<table>
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<tr>
<td>15</td>
<td>Care and maintenance' status and its relationship to rehabilitation work. 2.38 Mine operations where production has been suspended (for example, due to changes in commodity prices or technical problems) are referred to as being in a state of 'care and maintenance', where the site is maintained and kept safe until production recommences or the mine is closed. The use of care and maintenance can impact on the status and timeliness of rehabilitation work undertaken at a site. This issue is discussed further in Chapter 4.</td>
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<td>15-16</td>
<td>2.40 The Australian Conservation Foundation observed that most mine closures in Australia 'are unplanned and a result of economic and market factors'. The Mineral Policy Institute noted a study examining the reasons for closure of 1000 mines in Australia, which found that between 1981 and 2009 only 25 per cent of the mine closures examined were planned. The remaining 75 per cent of mine closures 'were either premature or unplanned closures resulting in unsatisfactory closures, mines left in care and maintenance or simply abandoned with no attempt at formal closure'.</td>
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4.61 Mr David Morris commented on the difficulties of managing a site in care and maintenance… When prices crashed that became a big worry regarding when these mines were ever going to reopen… So they remain in care and maintenance. If you opened a mine like that and the prices suddenly changed and you had a rehabilitation bond with the government that was too large that you could walk away from it, you would wait until the resource became more valuable. So a site will enter care and maintenance—when prices crash—become a big worry. There is no clear definition of care and maintenance sites and there are a lack of protocols between the departments dispute over the administrative and regulatory responsibility for the site.63

4.62 Most states and territories do not appear to hold detailed records of the number of sites in care and maintenance and the length of time these sites have been in that state, although there are examples of sites being in care and maintenance for decades.66

5.23 As at the end of the 2017 financial year, there were five projects in the program—one site which was abandoned after the introduction of the Mining Rehabilitation Fund (MRF), and four historic sites: the Black Diamond, the Procura, and the Elverdton Dumps.25

4.63 The MCA articulated the reasons for sites entering care and maintenance, acknowledging that low commodity prices may be one motivation: The decision to move a site into care and maintenance is a major decision for a mining company with all potential impacts carefully evaluated. One factor influencing this decision may be low commodity prices—which are often cyclical. Under these circumstances, a company may choose to manage the site until economic conditions are favourable to recommence operations. Care and maintenance should not be confused with premature closure of a mine. Periods of care and maintenance may last several years. However, in both care and maintenance and premature closure, the ongoing liability for the site remains with the mining lease holder—and it is not relinquished until government approval is granted. Care and maintenance may not be confused with avoidance of rehabilitation, which is safe-guarded by financial assurance mechanisms.67 4.64 Several stakeholders argued that regulations should be implemented that prevent mines remaining in care and maintenance indefinitely, and include stricter parameters around allowing sites to enter care and maintenance, to ensure it is not simply used to avoid rehabilitation. Mr Morris told the committee: [R]egulations should really include some kind of reasonableness requirement for a mine going into care and maintenance. Potentially, if there were a dip in commodity prices that meant a mine needed to go into a period of maintenance until that price came back up, that might be reasonable. But you’ve got to set some kind of reasonableness parameter around it, or a time frame parameter around it, because otherwise you can have these mines sitting and deteriorating in their care and maintenance mode, where the government can’t draw upon the rehabilitation bond they have and the community can’t start being employed in the rehabilitation of that site. You end up having a legacy that drags out for a very long time, and the only beneficiary of that is the company that’s responsible for the site.68

4.64 Several stakeholders argued that there is a need to consider whether to allow policies on rehabilitation. The practice of mines being placed into ‘care and maintenance’ indefinitely can also be used as a means of avoiding rehabilitation. A decision to enter ‘care and maintenance’ can occur with no need for the proponent to provide certainty as to when they will recommence operations or close and rehabilitate the site.62

4.3 This chapter also canvasses concerns relating to business practices that stakeholders feared could result in industry deliberately avoiding rehabilitation obligations, namely: the practice of mines being placed into ‘care and maintenance’ indefinitely; and mines being sold to smaller resources companies with significant rehabilitation liabilities outstanding.

Use of ‘care and maintenance’ as an alternative to site rehabilitation

4.57 As noted in Chapter 2, mine operations where production has been suspended are referred to as being in a state of ‘care and maintenance’, where the site is maintained and infrastructure remains largely intact until production recommences or the mine is closed.4.58 Some stakeholders expressed concern that in some cases, care and maintenance is used to avoid rehabilitation obligations when there is no prospect of mine operations recommencing. The Environmental Defenders Office of Australia (EDOs) submitted: ‘Of concern in every state and territory is that mines can avoid or delay rehabilitation responsibilities by entering an indefinite, and often undefined, ‘care and maintenance’ mode. Responsibilities during ‘care and maintenance’ tend to relate to keeping a site safe and stable and avoid any need to undertake progressive or meaningful rehabilitation. A decision to enter ‘care and maintenance’ can occur with no need for the proponent to provide certainty as to when they will recommence operations or close and rehabilitate the site.’

Business practices that may result in the avoidance of rehabilitation obligations

4.45 The committee heard concerns in relation to two particular business practices that some stakeholders feared could result in companies deliberately avoiding their rehabilitation obligations. These are the practices of mines being placed into ‘care and maintenance’ indefinite as an alternative to undertaking rehabilitation and closure; and mines being sold to smaller resources companies with significant rehabilitation liabilities still outstanding.

Business practices that may result in the avoidance of rehabilitation obligations

4.56 The committee heard concerns in relation to two particular business practices that some stakeholders feared could result in companies deliberately avoiding their rehabilitation obligations. These are the practices of mines being placed into ‘care and maintenance’ indefinite as an alternative to undertaking rehabilitation and closure; and mines being sold to smaller resources companies with significant rehabilitation liabilities still outstanding.

4.34 The report canvasses concerns relating to business practices that stakeholders feared could result in industry deliberately avoiding rehabilitation obligations, namely: the practice of mines being placed into ‘care and maintenance’ indefinitely; and mines being sold to smaller resources companies with significant rehabilitation liabilities outstanding.

4.34 The report canvasses concerns relating to business practices that stakeholders feared could result in industry deliberately avoiding rehabilitation obligations, namely: the practice of mines being placed into ‘care and maintenance’ indefinitely; and mines being sold to smaller resources companies with significant rehabilitation liabilities outstanding.

The Lock the Gate Alliance argued similar sentiment...
The Lock the Gate Alliance argued that while industry and the Australian government have at various points collaborated to produce leading practice guidance material relating to mine rehabilitation (as noted in Chapter 2), 'in the absence of a process that sees this guidance translated into action on the ground, they have little impact on rehabilitation performance'. Lock the Gate recommended that in order to drive improvement in rehabilitation performance, the Commonwealth should commit to working with Australian states and territories to develop a set of national standards covering issues including: closing loopholes that allow mining companies to place sites in indefinite 'care and maintenance'.

**Final Senate Committee Report – Recommendations**

**Recommendation 1**
The Australian Greens recommend that the Commonwealth Government coordinate and provide funding towards a complete national inventory of current and abandoned mine sites in Australia, including consistent national information about mines in the final closure phase and sites in care and maintenance.

**Care and maintenance**

1.12 The Australian Greens are concerned that mine operators in Australia are currently able to place sites in 'care and maintenance' mode with little or no restriction on how long this status may be retained without rehabilitation works being undertaken. While we acknowledge there may be instances in which a site's operations may need to be temporarily suspended, there must be clear parameters around how this occurs to ensure that sites are not being placed into perpetual care and maintenance mode in order to avoid site rehabilitation liabilities. Standards around care and maintenance are best developed at a national level to ensure consistency across jurisdictions.

**Recommendation 6**
The Australian Greens recommend that the Commonwealth Government develop enforceable national standards that limit the ability of mining companies to place sites into perpetual 'care and maintenance' to avoid rehabilitation obligations.

**Recommendation 1**
Labor Senators recommend that as a part of the upcoming legislated review of the EPBC Act and/or Labor's commitment to reforming environmental laws, the Commonwealth Government include in the consultation process the proposal to mandate that rehabilitation related conditions, as well as provisions regarding 'care and maintenance', must be applied to mining projects during consideration under the EPBC Act to ensure that approved mines have the lowest possible impact on matters of national environmental significance and to ensure approved mines are not left for extended periods of time in perpetual 'care and maintenance' while not being managed and monitored to avoid rehabilitation obligations.
Appendix 3 Approved Interview Questions

Questions

Government:
(Ice breaker type questions – how long have you been with the Department etc)

- When a company makes a decision to place a mine in C&M what then is your Departments role or how does the Department respond?
  - What kind of risk factors do you look out for and how do you manage or regulate those?
  - From a regulatory perspective are there benefits from mines being in C&M?
  - What happens when a mine goes out of C&M - what kind of pathways or options are there?

- What policies are there that are specific to mines in C&M or that could be applied to mines and C&M?
  - Is there an example of where this may have happened?

- Have you noticed any changes in the prevalence of mines going into care and maintenance?
  - What factors do you think have led to that change?

Industry:
(Ice breaker type questions – how long have you been with the Department etc)

- In your view what circumstances might lead to a company placing a mine in care and maintenance?
  - Is it more likely to be external factors or internal factors?

- Once a mine is in care and maintenance can you describe what might be happening day to day at the site?
  - What kind of risk factors would the care and maintenance team be looking out for?
  - What kind of benefits are there for putting mines in C&M?

- What kind of pathways are there for mines in care and maintenance, what happens after care and maintenance?
  - What is the most common outcome for these sites in your experience?

- Have you noticed any changes in the prevalence of mines going into care and maintenance?
  - What factors do you think have led to that change?
### 4.1 Causes for C&M

<table>
<thead>
<tr>
<th>Int.</th>
<th>Commodity Price</th>
<th>Resource / financial problems</th>
<th>Company size and diversification / strategic decision</th>
<th>Environment or Safety or Labour</th>
<th>Supply Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td></td>
<td>With a wider portfolio you’ve got more of that freedom to make decision, you’ve got the portfolio to balance them out and also obviously the majors typically have the better-quality deposits. You look at as an example what FMG are doing in the Pilbara their grades are significantly lower than what both what Rio or BHP produce. So they are more sensitive to those commodity cycles. Whilst they do have multiple operations, they’ve all kind of trading around at that lower quality level so they don’t have that ability as much to switch things off and on again. <em>(relates to commodity price and diversification)</em></td>
<td>The other one is when you look at more of a large business perspective so it’s not single mines it’s where they’ve got a portfolio there could be a situation where either gain because of commodity prices but again the individual costs of running a site things can move around in the portfolio. So you may have a league of operations and as certain sites may drop into the higher end of operating costs and the value and everything that if you’ve got capacity in another mine you would logically close down your lower margin operation to value add to the higher margin operation.</td>
<td>Other ones would be where you’ve had something gone wrong so if there’s an infrastructure area so if you’ve lost a key part of your supply chain or there’s a pit wall issue or perhaps there’s been a safety incident - things like that can shut you down. I guess there’s the technical component but also that license to operate perspective as well.</td>
<td>Also, downstream issues so as an example maybe your buyers stop buying and therefore there isn’t as much demand in the market anymore so again kind of driven by economics but its supply and demand.</td>
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<td>A2</td>
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<td>Most of these things go into C&amp;M for two reasons, the resource runs out or the price changes...</td>
<td>(once you’ve established that you’ve mined the highest grade resource and there is still resource left) You’ve now got two decisions to make - is it economic (with the gold price the same) we’ve built the plant that cost us $100 million, we’ve got the camp and all the people … it’s cost us $150 million to build a gold mine … it takes you 10 years from discovery to starting... you never ever want to work out how much it costs you to do the stuff in that 10 years because you would never ever go exploring...</td>
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<td>A2</td>
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<td>When you stand back far enough it tracks the total value of the supply of money that’s out there. The gold price - when you divide it into the amount of gold people think is out there vs the amount of money people think is out there that’s how you get the gold price. In the long run, in the short term it sorts of goes like that (indicates up and down).</td>
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<td>You track the value of gold over the last 2-300 years...</td>
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<td>A2</td>
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<td>we mine that resource and it is wholly and solely beholden to a price that’s decided somewhere in the world every hour. You can go online and find all the views in the world on what changes the gold price - no one knows. Right now, gold is suffering because the US interest rates are adjusting. In the short term you’ll see gold go like this (indicates up and down) because as interest rates go up the gold price goes down, but it will correct in the long run... You can track the value of gold over the last 2-300 years...</td>
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**Appendix 4 Interview Data Analysis (first phase) – Policy Issues**

A1 Copper and nickel are very much beholden to trade, if China is expanding up it goes, if the US is expanding up it goes, if we’re in the middle of a trade war down it goes it’s all very supply and demand driven. So, no-one really knows we’re all extraordinary optimists, you’ve got to be optimistic in this business, you get out of bed each morning and you go "it'll be ok (laughs), we’ll make it work today".

A1 < So we’ve got all this sunk capital and if we shut down what happens - we have to let all of these people go, which are our family and they’ve got families themselves ... each one of those people working there is paid a minimum of $100,000 it costs us $300 a day per person. they are incredibly valuable to us... this plant we spent $100 million building it was built solely for the purpose for processing that it has no other value, it’s not like a car... if you wanted to sell that (the processing plant) to another mine up the road it worth $5 (million) if you’re lucky. There is some serious naval gazing and conversations and financial calculations of what have we got to do to keep going, we still have a resource here and the shutdown cost is enormous ... everyone starts to look at what’s it going to take to go deeper and bigger, is there another ore body over here we can find... if the answer to all of that is no; or the other big driver is - we’re operating at $1200 but the gold price suddenly goes to $900 an ounce and our operating costs usually are - for something like that - are between $1100 and $1200 we’d be operating on the margin....
| A2 | We've got to here (indicates that the high value resource has been mined) we're thinking about doing this (expanding to mine the lower grade ore) and the price has changed - sadly it's a pretty easy conversation - well we've got to shut down. |
| A3 | There'll be a downturn in the market the commodity price will drop, someone else will come on to the market, additional suppliers coming onto the market so basically the economics of the operation is the primary reason that sites go into C&M. There are other reasons... |
| A3 | Then if you get into some of the very large metalliferous mines the sort of the iron ores, those sorts of things - don't know if I've ever seen an iron ore mine go into C&M they will like channel line deposits you will mine it out once it's gone its gone. The larger mines they tend to sort of keep going and when they shut, they shut. It sorts of varies between the commodities. |
| A3 | < The major issue is around the economics. The economics under the cost structure of the company is such that it is no longer economic to mine that resource, by and large. Because mining is cyclic, you know companies will, it's a big decision to be honest with you, a company may place amine in C&M as a temporary measure until the commodity cycle picks up again. That would be the primary reason why a mine would be placed into C&M. |
| A3 | < The benefits are obviously economic. You're basically positioning yourself for the next upturn so it's a very strategic benefit for the company. In some cases, a company might come to the conclusion that under their existing cost structure that they can no longer productively mine operate that mine so they may look at options to perhaps sell the asset as well. I would suggest that's not a very common thing to occur but there may be circumstances in which they look to sell the mine. The last thing they want to do for example is to close a mine when there is an additional resource there that may be profitable in the future, economic in the future and have a much longer life or perhaps during that period the company might make the decision to sell the asset if it's viable. |
| B1 | A site will go into C&M for a variety of reasons. It may go into C&M because its having financial problems or it may be the fact that the value of the resource has dropped on the share market and therefore the current operations are not feasible. |
| B2 | it really comes down to the value of the resource. Some mines have just got a really mineable resource then there is less and less potential for it to go into C&M. But those others that are just marginal... for example the coal price has just gone up that will give more people an appetite to get in there and actually mine those out. |
| B2 | Or something has happened at the site an accident or an issue on site that requires them to stop operations until that issues if rectified before they can recommence. |
One of your problems is always this question of commodities. Things like iron ore, the price was $120 then it was $50, if your cash costs are $70 that's never going to change much. If iron ore is hovering around $50 to $70, I can't see those sites coming back into operation. Other commodities it's a similar story. I mean there've been some gold operations where gold hits $1600 and everyone gets out of bed and goes to work in the morning thinking we're going to open the mine again, but it might not be that simple. Cash cost is one thing but the ability to predict forward prices, or hedge forward, it's a black art but you have to be good at it to survive that situation.

Volatility in the resource sector and particular the prices and particularly the copper mines the smaller mines are very dependent on the copper price going up and down and they go into C&M a fair bit.

When a company goes into C&M it can be for one of two reasons. The sort of benign reason is that the resource prices for the minerals its mining have taken a downturn and the operation as it is may not be profitable any more or marginally profitable so the company ceases operation for a short period of time, wait for the prices to get better and then pick it up and carry forward.

Different minerals go up and down – for example coal went down for a bit and is back up again”

There's various ways a mine can go into C&M the most common one is the resource has become uneconomical or extracted - so there's obviously finite lives for a lot of these mines We've found probably more recently the mine goes into C&M because the resource or the commodity price has dipped to a point where it's no longer economic rather than the resource being exhausted and that said even when they think the resource is all exhausted you often get secondary or even tertiary mines coming in taking over that tenement and the environmental obligations that they operate under and try to extract a little bit more of the resource out whether it's out of the tailings or the waste rock dump or even re-mining the pit itself to try and get a bit of resource out at a lower cost.

As you know with mining it's very cyclic. We've had a number in C&M over the last few of years that are now coming back online and coming out of C&M so obviously with the recent downfall over the last couple of years in the mining sector we saw a few go into C&M but with commodity prices coming up we're seeing that turn around so now we've really only got a handful that are considered to be in C&M with quite a few starting up and with a few more that are tipped to start up in the next year or two if things stay the way they are.

Yes... sites can go into C&M for all sorts of different reasons... the price of the commodity their mining has gone down means it's no longer viable in the short term, it might be again in a year or two's time,
< (Post GFC - especially with the gold price) gold is still a major commodity in WA so a change in the gold price definitely affects how many sites go into C&M. There seems to be a trend where there’s more sites trying to open up again rather than the other way around at the moment, that’s probably the trend that we’re seeing. It’s all driven very much by commodities and WA is mainly drive by iron ore, gold, petroleum then I think nickel and aluminium... there’s almost every mineral you can think of that’s a mine for it in WA. So, it depends very much on the different commodity prices. A few years ago, nickel was struggling really badly... nickel west was talking about closing down their large nickel mines in the goldfields such as Mt Keith and Leinster and now all of a sudden, their taking about longer-term expansions... so yes, its very commodity driven. Lithium is a big thing at the moment.

Things like the battery metals, there was a time where they, and even nickel for example the price of nickel just went through the floor and nickel mines were going into C&M left, right and centre and that was purely driven by the commodity price, so once the commodity price picks up then some of these mines start opening up all over the place. Things like lithium with the demand for batteries we have mines opening up all over the place.

Companies can isolate particular areas of a mine... for example - most gold mines have multiple satellite pits that supply sources of gold... if you look at the economics of mining it costs a lot of money to construct a mine and build a plant so there’s an incentive to pay back the debt and the loans that are taken on in order to do that in many cases mines are ‘high graded’ initially so they mine out high grade materials and then they come back later and take the lower grade.

Iron ore was a bit of an example of that with a lot of the marginal iron ore deposits when the iron ore price dropped right down suddenly became unviable but at a $180 a tonne pretty much the whole state was viable. The big companies obviously can sustain that commodity price changes because their business model and the way they’re structured and the volume of material they produced is such that they can weather what the smaller juniors can’t.

< Once the capital costs are paid off and the repayments on all the upfront borrowings are under control they can then mine the lower grade material and still make good but if they mine the lower grade upfront they’re not going to be keeping up with paying their debts... So a pit can be isolated and not mined for a while that doesn’t mean it’s been abandoned or whatever it’s just ’isolated’ it could be considered C&M but the projects not in C&M it might just be that one pits not being mined at that particular point in time. And if it is finalised then there is a process that needs to be gone through and sign off achieved for stating that the site has been left in a condition that’s acceptable... with a pit for example... that the pits been appropriately burred or backfilled or made safe, had the walls battered down, depending on what scenario your dealing with. In most of the cases with the deeper pits they tend to be just left as a pit void we accept that it will be a pit void and it’s not really going to be of any benefit in the future but it needs to be left in a safe condition with an appropriately established abandonment bund around that pit. They can sit like that for many years, decades and then someone can come back in the future and they might re commence mining, some of these might have underground developments at the bottom of the pits... things like seismicity can be a game changer when it comes to long term mining, it may be that’s it’s not safe at that point in time to go back in, but with improvement or different mining methods there may be the ability to go back in and recommence mining. At some sites it might mean a big cut back, the pits cut back to a safer angle and any problematic material mined out and removed so it will then allow for safe operation at the dept of the pit. The costs of doing that is significant and then economics come into play about how much resource is there and is economic to cut that pit back to go deeper to get that remaining ore, they’re the decision that are informed through geological models, market conditions. There’s a whole heap of drivers that would control how that occur. They Department and he Government don’t really have a hand in that ... it’s the company that make those decision about whether they will go in this pit or not, whether they’ll stop mining here and mine another pit for a period and just suspend mining in the other area.

< Benefit of going into CC&M) Changes in both beneficiation technology and in the value of certain commodities there is benefit if the tailings storage facilities and possibly the waste rocks remain open in C&M and haven’t gone through the full mine closure process because it can become economic to re-mine or reprocess. We’ve seen that with lithium at the moment, where there are tailings storage facilities that contain quite a large resource of lithium that which wasn’t valuable at the time it was deposited it they were extracting for the tantalum or something else and they’re now reprocessing. Which has a long-term benefit for the government because there’s less waste deposited in the environment permanently and has less impact than going and find a virgin lithium resource and new disturbance and all of that. I think that probably those circumstances are limited. So, where you’re talking about base commodities like gold and iron ore and even mineral sands, probably not so much (benefit).

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At other times it’s doing deals with buyers for that particular metal, so they do a deal with a big overseas company who wants to buy a particular commodity in bulk and they geta good arrangement and good deal with it that will be enough to sustain the recommencement of mining out of C&M and back into productive mining.

There’s always big spikes and boom and dips. Everyone you know suddenly goes off to work in nickel mines and then nickel prices have hit really high prices now are now made redundant and are looking for work anywhere... the same happened with iron ore, though far fewer of those went in to care and maintenance because they tend to be longer term projects. The same with gold, there’s a regular pattern over a couple of years a steady flow of the smaller sites going into C&M as they run out of resources because they haven’t done any exploration and

(see under commodity price - companies haven’t done exploration.... And run out of resource ...) They just process and extract the value out of what they know is there, without doing any expenditure to extend the life of that mine... if they’ve got the new structure and staff who are prepared to develop a regional exploration program and are prepared to spend money on it on a bigger scale.

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then there’ll be something that changes in the global commodity cycle or economic situation and there’ll be some merger and acquisition between gold mining companies or a new one will move into Australia and they’ll acquire a lot of the smaller ones and there’ll be an injection of cash and possibly a consolidation of processing capacity in a certain area, and people will go ok we’re going to upgrade the mill at this site which means we can bring this mine, this mine and this mine out of C&M and away we go again. That’s something that we see repeated over and over. Along with other things like the exchange rate.

it tends to be companies that get set up there’s a big expenditure on all the new infrastructure and then they just operate and they don’t spend too much money on exploration and then it comes to the end of that 7 to ten year mine life and they go into care and maintenance. Which doesn’t mean there’s no resource out there, they just haven’t had that in their plan it’s been a ten-year plan for what-ever reason. Then a different company will come in and acquire it because it’s cheaper because it’s in C&M and go from there.
### 4.2 C&M Mines in Practice

<table>
<thead>
<tr>
<th>What happens when mines are in C&amp;M / decision to go into C&amp;M</th>
<th>Out of C&amp;M - Selling/ exploration/ avoiding rehab / closure</th>
<th>Planning for C&amp;M / Mine Plans / time restriction</th>
<th>Prevalence of C&amp;M</th>
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<tbody>
<tr>
<td>So quite often what you see is... C&amp;M isn’t planned very well it’s reactive... because it is often off the back something off the scene like commodity prices, or an accident or infrastructure failure, that it’s not planned out very well so what will be a typical sort of approach is that things are shut down, they’re made safe... they get the crew off site as quickly as possible and then it’s really just you know might be a couple of signs put up a couple of fences but there’s no ongoing monitoring or maintenance of those, the site is basically shut down and there is no skeleton crew that manages it in that C&amp;M period. That is what I have seen in the past I think there is more awareness now that that isn’t acceptable and that you need to have C&amp;M plans developed in the event of unplanned closure.</td>
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<td>Time is a great one. Again, as resources continue to be mined, lower grades are going to become more and more attractive once the high grades are gone, so therefore something that is currently uneconomic could be economic in the future. The importance of that one is that you’re not doing anything in the short term that could sterilize that resource in the future. I think there is a huge opportunity that comes from that which is about temporary use of the land. So if you know there is a remaining resource in the ground that’s currently economic you’ve got all your infrastructure on site, so you’ve got accommodation, you’ve got power, you’ve got water, you’ve got everything you need could you use the site for something else for a 50 year period? And then once it becomes economic again you switch back to it. That’s something that no-one that I know of has looked at yet.</td>
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<td>An obvious one is divestment, so if a company still holds on to it, they could divest it to a junior who may have different operating overheads - so what uneconomic to a major could be economic to a junior.</td>
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<td>My view is that that’s the default, most mines that are said they’re in C&amp;M are actually closed or abandoned...That’s the thing, that’s that default. If they (small companies) go into C&amp;M it’s unlikely they’re ever going to start again unless they default they go bankrupt, the government will pick it up from an abandoned perspective or another company will come in and try to operate it again.</td>
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<td>What we are trying to move towards is that it’s more of a planned process so that there’s actually a demobilisation plan in place, you understand what your key risks are you make decision on whether you should keep pieces of infrastructure in tact or actually demolish them for the C&amp;M period what are your site security measures going to be are you going to have an onsite permanent security presence or not - those sort issues need to be taken into account.</td>
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<td>Certainly within (NAME OF CORP) we have it as a mandatory part of our risk assessment for closure that we actually consider if there’s a risk of unplanned closure and how we look at that is you know so it could be commodity prices, I mentioned earlier about the position on the cost curve and margins, if you’ve got a single site at the bottom of that cost curve you would have to consider that that’s at more of a risk of early closure than say one of the ones that producing most of your profit and therefore you have to have a C&amp;M plan at least a preliminary one in place that’s ready to roll for that site.</td>
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<td>Things like maybe geotechnical risks so as an example if you have a large pit even if you have a major wall failure and there’s a significant resource left you’ll probably still going to continue to mine because the economics suggests that even though it’s going to cost a lot to reactivates the pit you’re still going to do that. Versus if it’s a single operator, underground mine and a single shaft if you lose that shaft the mines done, you’re not going to start up again. So, should they have more proactive preliminary plans in place absolutely they should, and I don’t think the necessarily do.</td>
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<td>Has there been increases, probably after the boom I would say there would have been a lot - basing this on zero information - I think it’s an issue that’s always been around and will continue to be around because of the speculative nature mining operations.</td>
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You’ve now got two decisions to make - is it economic (with the gold price the same) we’ve built the plant that cost us $100 million, we’ve got the camp and all the people ... it’s cost us $150 million to build a gold mine ... it takes you 10 years from discovery to starting... you never ever want to work out how much it costs you to do the stuff in that 10 years because you would never ever go exploring... That’s the big thing you really do as much as you can to not go into closure. We’ve all got our mine closure plans, you know to to close all of that down is a big undertaking, then your rehabilitating that (tailings), your pulling that (processing plant) down, you’re removing that you don’t fill that in but you make that safe (open pit) and you walk away - or you try to.
So we’ve got all this sunk capital and if we shut down what happens - we have to let all of these people go, which are our family and they’ve got families themselves... each one of those people working there is paid a minimum of $100,000 it costs us $300 a day per person... they are incredibly valuable to us... this plant we spent $100 million building it was built solely for the purpose for processing that it has no other value, it’s not like a car... if you wanted to sell that (the processing plant) to another mine up the road it worth $5 (million) if you’re lucky. There is some serious naval gaz ing and conversations and financial calculations of what have we got to do to keep going, we still have a resource here and the shutdown cost is enormous .... everyone starts to look at what’s it going to take to go deeper and bigger, is there another ore body over here we can find... if the answer to all of that is no; or the other big driver is - we’re operating at $1200 but the gold price suddenly goes to $900 an ounce and our operating costs usually are - for something like that - are between $1100 and $1200 we’d be operating on the margin....

< It all comes back to this little puppy here (the left-over ore) the minute that (commodity price) moves past that (operating cost) you go hey guys let’s start up again. There’s that massive dynamic and most shareholders or owners of the company, we’re all intrinsic optimists, if that resource is there, if everybody is confident on the future upside of it, everyone goes yep let’s just keep it on C&M we’ll find it on C&M because who know what happens in a year or two time the price will change we all believe that we’ll get going again. Or if the owners and the shareholders have the view look that we just don’t think that the price is going to go up enough for us to justify restarting it we don’t want to own this anymore - you then go through a sale process again you don’t go through closure. There’s always going to be somebody out there who is going to value that. I mean look at that you’ve built all of that you’ve got all that physical infrastructure there. WA is such a small place these days somebody will buy that off you even if you’re selling to them for 1 million or 2 million dollars. We would all rather do that and put it into a set of hands who are going to look after it and somehow create value in the future, than tear it all down to destroy that value. In the big picture that’s the thinking and the thought process that drives companies when they’re running operations and then making those decisions of do we go into C&M or closure. Everyone would rather than avoid closure like the avoid - like you’d prefer to go to hospital - you would do everything you can to not go there.

So, the conversation goes along the lines of... we’re going into C&M or we’re closing. Ok we’re staying on C&M which means we’re not closing this (the tailings) we’re leaving it open which means we’ve got to managed it, we’re not closing this (the processing plant) we’re not shutting it down we’re not spending the million $ I just talked about we’re just bringing it down and we’re just putting it on C&M.

The reason we put it in C&M was because the underground mine had been losing money and the open pit was going to take a lot of money to start up and the company didn’t have the money to continue to fund the underground and to fund the new open pit. We presented this plan to the shareholder - this is the challenge but we need to shut down for a period of time work out the appropriate way to move forward and then we will need money from you guys to do this and they went “yep no dramas but we’re not ready to give you money right now it’s going to take us about 4 - 6 months to get the money sorted.” We went “no drama’s we’ll shut the whole thing down and put it on C&M”. That meant bringing the plant down we sadly laid about 100 people off in the first round of redundancies, we left about 50 people there because then over the next two weeks we slowly brought the underground down about 2 weeks later - out of the 50 we laid off about 30 -35 even today there’s about 15 people on site who are mainly the C&M people who are going down checking the pumps, we’ve got a power station here a couple of guys who run the power station, we have a camp we have a couple of guys the cooks the cleaners they’re all there running these blokes, then we’ve got two or three people here looking after the plant and this (tailings) they’re just maintaining it - you turn it over every day because their big pieces of equipment if they sit they start to get problems, you turn it over everyday oil it and grease it, we check all the pumps... we worked out that costs us about $200,000 a month... it’s a million dollars a year to leave an operation on C&M a year. Then there’s the government all of the tenements and everything we own that costs us another $1 million in land rentals and rates and all that sort of stuff. Just standing still and not producing anything costs a company $1200 we’d be operating on the margin....

In the past ten years they’ve mined in this area here and this area is almost extracted there’s about 25% or more left in that area... then we’ve got all this material here and we thought there was nothing here or the previous owners thought there was nothing there, (NAME OF CORP) bought it we’ve done a lot of drilling. Well what do you do - we drill we drill like mad, in the two years we’ve owned it we’ve taken it from this (shows image of small area of resource) to this (shows a much larger resource), from drilling we’ve added all of this (shows the larger resource).... in two years we’ve added at least 6 years to the mine life, I reckon this thing, this mine on its own will go for 10 years, we only know it’s going to go for 5, I can only put my hand on my heart and say five years but I’m pretty confident we’ll find another 5 years after that. On top of that they’ve discovered, we lost another ore body the size of (NAME OF MINE) - we just can’t process it yet because there is a technical challenge with regard to processing it.
about $2 million a year. So, their pretty serious conversations that you go through with regard to putting it on C&M. Does it get any cheaper if you just shut it down and walk away - absolutely not - your liabilities increase because you immediately go into closure.

Going into C&M is your last choice... your biggest cost are your fixed cost which are your people. Maintaining the asset as I said it's 2 million bucks a years, it's easy to go into C&M, it's an easy thing to do it's coming out of C&M that is really really hard... that's what people are thinking about at the time... it is an easy tool but people choose not to do it because they know the consequences ... and the hardness of coming back out of C&M.... when you're going to want to come out of C&M it's going to cost you $10 (million)... the first thing everyone looks at when we're facing that is how do we cut costs and maintain the revenue and the first question is can we shed half our workforce and continue to operate.

So our company is having that conversation what are we doing to avoid closure at some point in time well we've been exploring aggressively to expand the life of the known asset and we're starting to look into these other areas and look at these other known assets or resources to see how can they could be brought into the business model of the operation that's the majority of what we do. The other thing we do, and we're not there yet, but our plan - one of my jobs... is to say we don't want to operate our operations at this point (indicates the 5% operating margin) on the cost versus revenue, we want to operate such that we have a 20% or a 30% margin every day of the week such that the business is generating money that can be put into exploration that can be put into sustaining the operation and making sure that we can have good conversations about everything else that goes on with operating a good mine.

Not a lot (lol)... effectively when a site goes into C&M or it gets mothballed, so initially there's a fair bit of activity in terms of all the pipes have got to be flushed the tanks have got to be drained. Basically, the hazardous chemicals and the hazards around the site need to be addressed. So, there will be a lot of those chemicals will be removed those sort of things. Also, there'll be a general clean-up of the site to start with you know a lot of waste and rubbish and those sorts of things will get picked up and then security measures will be put in place. Whether that's someone regularly visiting the site, or they put a fence around it, it will vary depending on the location and so forth. Then a sort of C&M plan will be put in place and that will generally involve, certain parts of the plant need to be turned over to keep them visible. So, someone will go in and they'll start up the bore mill if it's a gold plant or they'll press the button on other things, pumps and those sort of things - just simply to keep things operations.

Basically, it would depend on the commodity. Like gold sites never seem to close because new technologies come along, there is always gold in the ground, we will always chase a lower grade through technology or price or those sorts of things. You often find with gold operations they will go onto C&M and with a very high chance, that at some point, they will re-open. Often with the capital investment that goes into a gold mine is fairly small so even if the plant is not maintained properly it's not much for a newer company to come in replace the plant and get an operation going again.

Generally you will find that there will be a sort of routine maintenance program that will still need to be going on the number of people that will be on site at any one time will range from nobody to a few depending on what the operation is and where it is.
irrespective of whether the plant is operation, it's still a going concern if you like.

There are some sites that have been on C&M for a long period of time. E.g. Cause Nickel, Bulong that went onto C&M 3 or 4 times that was a nickel laterite. Not sure if it's currently going at the moment. Magellan lead. A lot of them go C&M and come out again, but it does seem to vary on size. The smaller owners can do it more effectively.

There are certainly companies that will just hold a site in supposed C&M to avoid doing their rehabilitation works. The mines Dep’t knows this but they don’t have a lot of ability to make changes. There are some requirements around expenditure on operations but it’s fairly minimal it can be as low as $5,000. It’s not hard to spend $5,000 on a site to claim it’s in C&M. The Departments kind of boxed itself into a corner because if it actually then sort of then calls out that company and say’s no actually your closed the company can then just go in to liquidation and hand back its lease and say ‘fine’ and avoid the whole thing anyway. The Departments in a very hard sort of position where it if it makes too much noise around this C&M issue then it will end up with a greater number of abandoned sites on its book and at the moment it probably wants site in C&M rather than abandoned. Which is an interesting policy situation.

A company’s first preference is to not put a mine in C&M, because it’s productive and it’s an asset, it’s owned by the company and it’s a very very expensive asset to maintain even if you’re not operating. In the first instance I think companies are very averse to putting mines in C&M.

C&M certainly isn’t abandonment, abandonment is not something we ever want to see in the industry, quite clearly. That means a company has defaulted on its obligations and walked away. Regulations have matured to a point, I think, where that is pretty unlikely. Governments have safeguarded through the bonding mechanism. Abandonment I think is the poorest end point for any mine site, in this day and age we would not want to see that whatsoever. And as I said I think safeguards are in place to avoid that happening or at least secured funds to cover any liabilities remaining should government be left with that liability. That doesn’t happen very often I would certainly hope.

How do we manage this site when it’s in care and maintenance, we have a license, they have an environmental protection license through the EPA and we require them to maintain their storage capacity out there, even when it’s in C&M mode. And they have to notify us when it gets to a certain level and that certain level is determined by a storm event. So, we allow them for our rainfall area I think it’s a 1 in 100-year 72 hour storm event – they have to have the capacity to contain that. So, if they have a storm, they should be able to capture it all. After that storm event they have about 7 days to discharge or reduce their water level.

We still hold the same requirements (whether operating or in C&M) those licenses are available on the website....

If a new owner comes in and purchases that they may well take on the liability of past activities. It’s a bit of give and take, if a mining company comes in they don’t want to start with a headache from someone else’s poor practices, but those practices occurred many many years ago, and obviously what they did back then we wouldn’t allow now.

There are a couple of conditions on the license that are specifically related to C&M mode. As I said the issues arose in 2011 / 2012, and we actually get them to review their water balance annually to make sure their tracking alright.

A couple of mine owners have looked at it and have done some analysis on the ore that’s left there. Unfortunately, it hasn’t looked profitable enough for them. The practices that were engaged in the 1800’s obviously they left a lot of the ore that they could possibly extract now with modern practices.
Certainly, any legacies at a mining site, and a new mining company wanting to come in and mine it they are considered that they will have to take on those old legacies and try and rehabilitate them if they can. Sometimes with those efforts it might be a joint negotiation, they might say well if we rehabilitate this area, or we might be willing to do this but we’re not willing to do that, or we might do this if you help us out with some funds to do the rehabilitation work. It’s the case of you’re better off having them in there to do the works, and maybe do the mining and maybe do some rehabilitation works rather than not having anything done. At the end of the day you want a win win situation, a win for the community, a win for the environment and a win for the company – they’re the best outcomes if you can get them.

There are requirements there it’s probably more of a case of if a company just winds up rather than going into a c&m mode where they just probably say ok well it’s no longer profitable for us to do it so we’ll try and sell the facility but stay here until we sell it. The ones that give in to the problems are when they just go the company ceases to exist we’ve got no assets its gone to a receiver your dealing with an accountant that comes it that doesn’t know anything much about the mining, he’s trying to get the best he can out of the liquidators for the people who are owed money. I’ve only had that happen once…. It all happened pretty quickly the resource was picked up fairly quickly by the new operators, so it wasn’t too bad.

Going from c&m might be a precursor to closing the sites and receivership it becomes more of a problem, they just walk off the site and leave it and go into receivership. The c&m mode normally a company makes a financial decision that they wish to sell that asset or move elsewhere or do whatever, it still, resources are still there to maintain it. When it goes into receivership it becomes more of a problem, they just walk off the site, tools are left, tools and equipment are just left, that’s probably more of a messy scenario than a c&m mode.

We have the legislation, which is primarily our driver which is called the Protection of the Environment Operations Act and the associated regulations under the Act. All our policies come off that Act. Whether the mine is operating, or it slips into C&M we still want the same outcome. As in we will still have limits on discharge from the premises if it has any discharges in the way of water. Presumably if it’s in C&M mode it wouldn’t have any stack emissions from an actual processing facility, so air emissions, presumably it wouldn’t have anything like that operating, primarily you’d only have a storm water discharge limits and they are dealing with quality of storm water as well as volume.

The license remains the same... we’ve put a couple of conditions to ensure it is flexible enough to be applicable even in an operational stage or a care and maintenance stage.

I think the worst-case scenario is a company operating until they walk off the site and leave it and go into receivership. The c&m mode normally a company makes a financial decision that they wish to sell that asset or move elsewhere or do whatever, it still, resources are still there to maintain it. When it goes into receivership it becomes more of a problem, they just walk off the site, tools are left, tools and equipment are just left, that’s probably more of a messy scenario than a c&m mode.

There are a couple of other players you have with a mine, the Department of planning, also you may have the local council.... The planning legislation here is tiered structure. Small developments that aren’t state significant or larger the local council will approve it, deal with the assessment process. Larger developments the state planning authority will take on the role of assessment and in conjunction with the council will deal with any approvals or denials. Also being a mine, you have the Department of natural resources or the old mines department, they change their name fairly regularly depending how the government is going... The mines department issue a mining operation the company has to submit a ‘mining operations plan’ which has to be approved by the mines department. They also oversee part of that, they issue them a license as well within that. It could be the council, or it could be the planning NSW they have issued a development consent approval, now a development consent approval will have a number of conditions and so they’ve got to adhere to those as well.

Certainly the cases of if a company just winds up rather than going into a c&m mode where they just probably say ok well it’s no longer profitable for us to do it so we’ll try and sell the facility but stay here until we sell it. The ones that give in to the problems are when they just go the company ceases to exist we’ve got no assets its gone to a receiver your dealing with an accountant that comes it that doesn’t know anything much about the mining, he’s trying to get the best he can out of the liquidators for the people who are owed money. I’ve only had that happen once…. It all happened pretty quickly the resource was picked up fairly quickly by the new operators, so it wasn’t too bad.

The same thing occurs again, when they (sapphire mines) slip into C&M they still have disturbed areas which they must maintain... So, if the prices are going down or they’re going to stop mining they would be required to rehab or stabilise that area that they’re currently disturbing and that would be left to rehabilitate.... The main thing is we get them to maintain or ensure that any active area that they're actively mining is rehabbed and stabilised before they go into a C&M mode. But it’s very easy as I said when you’ve only dealing with a couple of acres at the best of it.

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Going from c&m might be a precursor to closing the sites and walking away from them but certainly, as I said, we just watch the sites when they go into C&M just ensure there is maintenance and monitoring being undertaken by the company, and that’s all you can do I suppose.

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Sometimes you've got to be careful. The current site has been closed since 2015, it's going on 3 years. There's still staff out there it's still owned... It's (c&m) certainly a warning to say look ok look we have to keep an eye on this facility, you don't let things lapse, as in you know you don't like to find an annual return or sampling, water sampling hasn't been done... you need to maintain that rapport with staff on site, they'll let you know pretty quickly if it looks like it's going to go south and possibly going into receivership. I suppose the main thing is that when it does go into c&m mode you do keep a bit of a watching brief on it to make sure it is still actively being maintained.

It's a bit like if you're trying to sell your motor car you're better off maintaining keeping it washed and polished and looking good to try and sell it rather than letting it sit out in the yard and letting it fall apart and then trying to sell it.

So, a MOP is I guess it's a bit of a weird term even when they're in c&m they are still required to have a MOP. And effectively what a MOP is a rehabilitation management plan. When C&M triggers them to submit a new MOP and that MOP needs to detail the types of activities, including rehabilitation, C&M of rehabilitation that will be conducted through that C&M phase. Now a mining operations plan can be approved anywhere up until 7 years. Generally, in terms of C&M we actually approve them for a shorter period of time. Of recent times we've generally been shortening that up to a 2- or 3-year period and the logic behind that is... if they ask for an extension, they need to justify to us as to why they need to continue in C&M.

I think in NSW we don't see it as much as you do in WA, particularly there's a lot of metalliferous mines in WA, you'll see one mine take off because the metal prices for that particular metal has gone up, where another one like zinc for example has gone down - so they just mothball that site and wait around for that commodity take off again before they recommence mining. You see that a bit more in WA. Certainly, in NSW with potentially more metalliferous mines coming up in the west you may see more and more of that happen.

As time goes on and they continue to have it in C&M we do have what they call 'good faith provisions' under the Mining Act. So, if you look under section 125 which is 'grounds for cancellation of authorities'. We've just gone through a bit of an exercise where we've identified a lot of sites that have actually just been in a holding pattern for a number of years. So we've actually sent out a 'show cause' letter to all of the sites to say well show cause as to why we shouldn't be cancelling this lease particularly around the good faith argument which is section 125.1g that they need to demonstrate that they're actually utilising - well that the decision maker is satisfied that the holder of the authority has failed to use the land the subject of the authority in good faith for the purpose of which the authority was granted or has used the land for a purpose other than which the authority has granted. So that's our hook in terms of actually having a site continue to go on in C&M, they need to demonstrate to us as to why there's still utilising that land in good faith.

We can direct them to issue a MOP for closure. Transfer them from a C&M phase into a closure phase.

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To show what they're doing to utilise that site. It's reasonable you know to say the market has dived at this time it's not feasible. We can't drive somebody to mine it's reasonable you know to say the grounds for cancellation of authorities'. We've just gone through a bit of an exercise where we've identified a lot of sites that have actually just been in a holding pattern for a number of years. So we've actually sent out a 'show cause' letter to all of the sites to say well show cause as to why we shouldn't be cancelling this lease particularly around the good faith argument which is section 125.1g that they need to demonstrate that they're actually utilising - well that the decision maker is satisfied that the holder of the authority has failed to use the land the subject of the authority in good faith for the purpose of which the authority was granted or has used the land for a purpose other than which the authority has granted. So that's our hook in terms of actually having a site continue to go on in C&M, they need to demonstrate to us as to why there's still utilising that land in good faith.

We can actually issue directions. So, they're called section 240 directions, we can issue 240 directions for a range of issues. So we can basically issue a direction to give effect to a condition, so we can give an effect to that title condition to submit another mop it could be to address and adverse impact or address a risk of there being such an impact to conserve the environment to rehabilitate land or water, so we can issue a range of notice to actually do that.

We don't necessarily treat a mine in C&M any different from an operating site, they still fall under our regulatory remit we still go out and inspect them, we're still looking at a security, they're still preparing annual environmental reports, we're still looking at them as they would be mining. It's just a different phase, as to what they're up to. Our regulatory regime doesn't really change, we've still got oversight over them.

That's were a security bond process comes into it to make sure we've got sufficient security that in the event that that does occur that we have got funds to be able to undertake the rehabilitation. We consider that as an end of pipeline solution.... As part of our regulatory oversight over that sight we'd be issuing directions at that site well in advance that will exist before that would occur. Obviously there has been times in the past where that regulatory oversight hasn't been that far.

It would generally be managed by the Derelict Mines Program.... That security would be forfeited, and it utilised for the rehabilitation of that site.

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To show what they're doing to utilise that site. It's reasonable you know to say the market has dived at this time it's not feasible. We can't drive somebody to mine it's reasonable you know to say the grounds for cancellation of authorities'. We've just gone through a bit of an exercise where we've identified a lot of sites that have actually just been in a holding pattern for a number of years. So we've actually sent out a 'show cause' letter to all of the sites to say well show cause as to why we shouldn't be cancelling this lease particularly around the good faith argument which is section 125.1g that they need to demonstrate that they're actually utilising - well that the decision maker is satisfied that the holder of the authority has failed to use the land the subject of the authority in good faith for the purpose of which the authority was granted or has used the land for a purpose other than which the authority has granted. So that's our hook in terms of actually having a site continue to go on in C&M, they need to demonstrate to us as to why there's still utilising that land in good faith.

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We don't necessarily treat a mine in C&M any different from an operating site, they still fall under our regulatory remit we still go out and inspect them, we're still looking at a security, they're still preparing annual environmental reports, we're still looking at them as they would be mining. It's just a different phase, as to what they're up to. Our regulatory regime doesn't really change, we've still got oversight over them.

That's were a security bond process comes into it to make sure we've got sufficient security that in the event that that does occur that we have got funds to be able to undertake the rehabilitation. We consider that as an end of pipeline solution.... As part of our regulatory oversight over that sight we'd be issuing directions at that site well in advance that will exist before that would occur. Obviously there has been times in the past where that regulatory oversight hasn't been that far.

It would generally be managed by the Derelict Mines Program.... That security would be forfeited, and it utilised for the rehabilitation of that site.
### B2

The first thing we do is check that we hold sufficient security to rehab the site as is. Right. Which is obviously important because if they're going into C&M, they're not going to be making more money we need to be sure that we are holding sufficient security to minimise any exposure of the community to paying for clean-up. So, there's checks on security.

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<tr>
<th>In terms of environmental management, the power of the act is undiminished whether the mine is in C&amp;M or operating. The point is that if you're not in C&amp;M or you're not operating then the expectation is that you will be actively working to close down and rehab. And bear in mind as I said at the beginning the first important point is making sure we're holding the right security, so if the worst comes to the worst the government can step in and complete cleaning up that site.</th>
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<td>There are operations that you look at and think yes, they could have a chance of restarting, you have operations you look at and you think no that's never going to work again. And then you have a third class of operation where you think ok if they changed the way the operate they could maybe continue and make money and that maybe an operation where you continue excavating the commodity but you might not get for any form of processing you might just sell the raw material.</td>
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<td>The Act requires that there is a document called the Mine Management Plan which is updated annually or as required. If you go into C&amp;M, then your MMP is in the C&amp;M Plan. To maintain the authorisation there has to be an MMP. There was talk of revising the MMP template to include a C&amp;M template but it's difficult because, as I said earlier on, each site is unique. Having a template is difficult, having a template for C&amp;M is even more difficult - exploration seems to be fairly straightforward.</td>
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### B3

If the proposed intention is to restart at some time in the future when the market changes positively then we would be looking to make sure they have a program to keep everything operational if you like without risk. So, this would be things like inspecting pipes and circuitry to make sure there was like I say there is no leak or fire risk during the C&M period.

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<tr>
<th>We have one site I can think of that went into so-called C&amp;M, but I think they were just hoping that the market would change and in the mean time they are working on the long term rehab. My gut feeling is that the market is unlikely to change sufficiently for them to come back into production. Fortunately, it's a commodity where they don't have a great deal of onsite processing there's not a lot of complications. But if you think of a gold mill or a uranium mill or a copper mill or aluminium plant, stopping that for any length of time give you an awful lot of headaches when it comes to restarting. And that in itself can often be an economic bar to restarting.</th>
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<td>We then require a C&amp;M plan. Which would set out all different aspects, now primarily we're concerned about environmental protection ....</td>
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<td>We'd also look at plans for restart, what activities, how much notice would you be giving us for a restart.</td>
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### 203

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<th>In other countries I've seen plants that have been idle for 15-20 years and these were centrally planned economies admitted, and people sort of said oh well we could start again tomorrow - well unlikely. Apart from anything else you have to remember that if you've been idle for a few years, apart from all the sort of mechanical, electrical, physical issues of restart - rotating machinery, hydraulics, electrics, you've got the fact that technology has changes possibly in that time, even though the commodity price has increased you may be competing against a more modern plant and in order to meet the market requirement you might have the need to introduce new technology, process technology and it might just not be possible or economic to do so.</th>
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<td>Whether you should say 5 years or 10 years I would say 5 years, personally. It's certainly not a policy matter here at the moment. But purely and simply because I look at oh the (NAME OF MINE) I think, back in the 1980's early 90's there's all sorts of things that can go wrong. I mean they mothballed the plant, they cleaned it thoroughly and all the rest of it but walking around on inspections after that time you could see materials rusting structures starting to fall through lack of use and deep maintenance. People who knew about the ins and outs of the plant moved on - that's a significant issue on many sites.</td>
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<td>Maybe half a dozen, it might be more, if you go to the Department website there may be a list there, I'm not sure, there used to be ... I can think of about 3 or 4 that claim to be in C&amp;M. As I say, one I'm aware of is doing a lot of active rehab while hoping commodity prices increase. Another one I know they suspended operations to do a lot more exploration and they will probably restart, and the others - well your guess is as good as mine as to what their real intention is.</td>
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When people go into C&M basically what will happen is generally speaking people will call us... unless people formally notify us, or we see it through ASX announcements ourselves - there's no formal notification process in QLD at the moment. But we generally will find out through some way or form, through our friends at NRM or through the company that they've gone into C&M. Our response from there is generally we'll talk to the company and say 'look what are you doing' making sure they will still adhere to their environmental obligations and if required we will issue documentation either an order or something to make sure they will continue to do so. But in the first instance they become what we would consider 'higher risk' so we would send our compliance team out there to make sure they still complete all the works required under the environmental authorities.

We don't have specific policies for C&M mines, but QLD is as you know we're working on that. We don't even have a formal definition of what is C&M. But we can apply all our ordinary policies in terms of enforcement in our act we can apply anything like all our tools in our act to a C&M mine it's just the biggest decision making criteria you have around administrative decisions areas - is it worthwhile doing it, do they have the means to actually do what we want them to do, if we do this will they go out of business you know so you have some financial implications to consider when you make those decisions but we basically can use any tool under our act for C&M. It's just we deal with them as if their a normal mine.

We've got a regulatory strategy that says if you're higher risk we will come to your site more often so we would put them on a list that I could request that my mine compliance colleagues to actually go out there. And the person that's signs the orders where there is an option to do a bit of downstream processing at the site and improve the economics but if the commodity price is down you might be better off just saying ok I'm just going to sell the raw material I can do that and make dollars, whereas the investment in downstream processing is not going to pay me back anything. As I say every site is unique and that's your problem, while that sounds like a bizarre scenario I can think of one situation where it's absolutely spot on, and there are various production costs that could never change if they went into that area and therefore just digging up and selling the raw material was something they could do and make a profit but they could no longer make a better profit by processing because other things had changed.

Companies tend to come out of C&M when the price goes up so they're very price dependent in terms of being able to make a go of mines... The ones that are totally financially unsound will end up being sold or being abandoned.
B4

< When they on sell we generally will get the company... come back and say we're going back into production what do we need to do so most of them once they get sold do go back into production.

B4

< When it’s disbanded, abandoned the tenue goes so then the only way is to peg a new tenure and that’s a whole new process so we don’t hold the property we become the owner of the property we have to manage it and we own the asset so with mine another company did come in and peg the mining lease so they need to go through a whole process of a new mining lease being granted. So it’s not that easy for us to do that but a process there in terms of disbandment you know I think it would be more helpful if we had a special tenure for that so we could actually sell an asset or at least get another company to take it over. Because if you have to go through a new mining lease that opens up Native Title aspects etc. That in itself is a little bit challenging.

B4

< Ah look when there is a break in tenure, so the legislation is pretty clear, when there is no break in tenure the new company is responsible for the previous harm and previous disturbance, so like if the tenure just goes from you to me that’s fine if there’s a break in tenure and there was an abandonment the company can argue that the previous harm isn’t theirs and we can’t a) calculate financial assurance for it and b) unless you negotiate out that they are responsible for that they might be able to not take that on. We can always negotiate because they need to get an environmental authority from us, but it’s not a neat process.

B4

< The biggest problem is in relation to, as I said to you before, the tenure component of it. Whilst there is a tenure in place we can issue documentation and people can access the mine... like we will pursue people to a Director level if we have to, so even if the company is not viable we can back to the Directors and issue executive officer liability. If the mining tenure is not there, although the EA then survives; right the environmental authority the environmental conditions survive if they have no access we can’t issue any other documentation to say you have to do XY and Z if they have no access, so that’s a little bit hard for us.

B4

< What happens is once a site goes into care and maintenance, generally the attention that’s turned to the site gets less and less, and the longer it goes on for the less there is. And then that’s when difficulties start to come because it gets harder and harder to restart it. Partly because machinery just wears out, corrodes, suffers from lack of maintenance, those sorts of things. And that also affects the ability for another company to come in and start it up."

B4

< "C&M could be just a wait it out or it could be a precursor step to go into receivership and then into liquidation then into either windup or disclaim.”

B5

"What happens is once a site goes into care and maintenance, generally the attention that’s turned to the site gets less and less, and the longer it goes on for the less there is. And then that’s when difficulties start to come because it gets harder and harder to restart it. Partly because machinery just wears out, corrodes, suffers from lack of maintenance, those sorts of things. And that also affects the ability for another company to come in and start it up." We’ve got to work within the legislation that’s current, we can’t exceed our powers ... that can limit us at times. What we can do is amongst our-selves, between our agencies, talk about what we know about how companies are operating. For example, if a company starts to struggle it might start not to pay its annual lease rental fees, it might start not to pay council rates, things like. Or the environmental authority costs. That sort of thing. Or it might even from a safety and health concern it might start to get a little bit slack on the maintenance of the equipment and there could become a few safety issues relating to that - maybe there’s not enough staff on site to manage everything, those sort of things. They are all tell-tale signs that we can collectively get together and give ourselves a heads up on. Now the thing is it’s got to be an internal confidential thing because some of the information is commercial in confidence and it could well impact on the financial and shareholder status of the company if it was made public and as government agencies we’re privy to commercial in confidence information about companies. We have to be very careful about that.

B5

"C&M could be just a wait it out or it could be a precursor step to go into receivership and then into liquidation then into either windup or disclaim.” We’ve had 4 operations go into liquidation over the last two to three years... the circumstances leading up have been various. One of them is because the operation had a major disaster on its site and was closed down by government because there was ongoing concern about impacts. One was because it had been struggling for years and years and when we asked them for increased financial assurance, they decided that they would get out. Another one had come to the end of its mine life, it had been sitting there just waiting around maybe someone wanted to do some final mining of the remanence of the ore body and no one came along so in the end it had got to the point where the company ran out of resources and again disclaimed

B5

"We sometimes get involved in looking at sites that may be struggling to just help get a feel for the sort of issues that are on the sites. Or that we can maybe look forward to say well if this company goes into receivership or liquidation then these are the sort problems the state will be left with. Sometimes if you get in early enough you can have conversations with the company and get them to do a little be to improve the status.... at least getting them into a proper maintenance mode while they’re in that, proper care rather than just neglect... improper management and maintenance where there is not enough attention paid to a site.” "We've had 4 operations go into liquidation over the last two to three years... the circumstances leading up have been various. One of them is because the operation had a major disaster on its site and was closed down by government because there was ongoing concern about impacts. One was because it had been struggling for years and years and when we asked them for increased financial assurance, they decided that they would get out. Another one had come to the end of its mine life, it had been sitting there just waiting around maybe someone wanted to do some final mining of the remanence of the ore body and no one came along so in the end it had got to the point where the company ran out of resources and again disclaimed

B5

"You could have a company that has multiple operations, where they close one down for a while and if they have plenty of resources they could do a good job of maintaining that site to the point where it’s a very simple process to start it back up again when there’s an upturn in the resource price of the minerals they’re mining and away they go again.” "We've had 4 operations go into liquidation over the last two to three years... the circumstances leading up have been various. One of them is because the operation had a major disaster on its site and was closed down by government because there was ongoing concern about impacts. One was because it had been struggling for years and years and when we asked them for increased financial assurance, they decided that they would get out. Another one had come to the end of its mine life, it had been sitting there just waiting around maybe someone wanted to do some final mining of the remanence of the ore body and no one came along so in the end it had got to the point where the company ran out of resources and again disclaimed
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<th>It’s not always a matter where companies deliberately take away resources and under provide for an operation that’s been mothballed but through slow creep and attending to other things you know it’s easy to have things just slip by you... it can be a slow downward slide.</th>
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<td>If we’ve been involved with that mine site before, in the sense that we’ve issued permits, then we’d look at what the permits, the conditions on those water effecting activity permits would be and then provide advice to the regulator which is the Department of Energy and Mines, around well this activity is actually, they haven’t done this activity therefore there either nothing they need to put in place or they’ve started this activity they may need to complete this in a time frame... things like that and if it’s already been completed then it might just be noting that while it’s in C&amp;M if they’ve put in for instance bunding around a site then they need to maintain that bunding so even though they’re not on site they need to maintain it because that’s not part of the closure that we might of had in terms of the conditions on the permit.</td>
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<td><strong>B7</strong></td>
<td>Our Departments role is to administer adherence or compliance to the Mining Act, the Mines and Inspection Act and the Opal Mining Act. I'll just be talking about non opal mines, I'll be talking about metalics, uranium and quarries, which there are 5-600 across the state. Under the Mining Act... you apply for a mineral lease which if granted give you exclusive rights to mine the resource in payment for part of the royalties and typically there is a limited term for those leases.</td>
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<td><strong>B7</strong></td>
<td>Very rarely. We've kind of got a sliding scale of enforcement from negotiations and coercion all the way up to formal letter and then fines and really we only extinguish a tenements in extreme circumstances when its proven repeatedly that the miner can't continue to mine or meet its rehabilitation obligations. Before we relinquish tenements, we would use the bond to do the rehabilitation ourselves... then we'll see out the rest of the tenement and then we just don't renew it, it will be surrendered and then the miner walks off.</td>
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<td><strong>B7</strong></td>
<td>If you asked me 5 or 6 years ago I would have said C&amp;M is really only in extreme circumstances when a mine is about to go into closure or administration... there's a lot more mines still in C&amp;M than in operation in SA in the leaner times</td>
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<td><strong>B7</strong></td>
<td>&lt; Private mines are actually exempt from some of the provisions of the Mining Act and typically are over metro quarries and longer legacies sites but for all intents and purposes we try to regulate them like we would any other mine... Mineral leases are for metalics and uranium and extractive mineral leases or EMIs are for major extractives he definition is a little bit blurred...</td>
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<td><strong>B7</strong></td>
<td>&lt; Now you have both license conditions within the type tenement that you have so a mining lease has various lease conditions and they're just high level so you know access to land and broad environmental outcomes. The PEPR or the other environmental approval is under this legislation has a lot more detail so it has particular criteria that the miner has to meet like the protection of surface water, groundwater, air quality, noise, dust, traffic all the types of issues you'd expect to see at a mine site.</td>
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<td><strong>B7</strong></td>
<td>&lt; All types of mineral leases require a PEPR - A Program for Environmental Protection and Rehabilitation, formerly, up until about 5 years ago they were called MRP - Mining and Rehabilitation Plan - effectively the same thing. Private mines have what's called a MOP - A Mine Operations Plan, and some very old mines have what's called a DP a Development Plan. Basically, they outline how the mine will operate and what the environmental criteria that the miner has to meet.</td>
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<td><strong>B7</strong></td>
<td>When a miner goes into C&amp;M, they're still obliged to meet conditions under their PEPR... often they will notify us when they go into C&amp;M or we'll often know in advance.</td>
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<td><strong>B7</strong></td>
<td>When a site goes into C&amp;M you lose access to the plant and equipment that was there before. That's why we push for progressive rehabilitation concurrently with the mine operations because you've got the machinery there you've got the cash flow that the company has that to reinvest into rehabilitation and it reduces the overall risk to the state and therefore the amount of bond the miner may have to hold if they rehabilitate as they go...</td>
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<td><strong>B7</strong></td>
<td>There's obviously other times where a mine goes bankrupt, administrators take over now that can go into C&amp;M as well, so I've got a number of sites that I look after where administrators are responsible for the C&amp;M and that's a bit more difficult because there's no real active rehabilitation going on and you are waiting for another buyer to come in and buy out the stranded asset and then meet some of the rehabilitation obligations.</td>
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<td><strong>B7</strong></td>
<td>Often the case in C&amp;M is you still have your rehabilitation obligations to meet. Often when you're in C&amp;M is concurrent with meeting parts of your rehabilitation. You can have both C&amp;M and rehabilitation for example if you want to rehabilitate the pit or part of the abandonment bund around the pit you still want to keep the waste rock dump or the tailings open just in case you want to add to those or remine those down the track you'll put the mine into C&amp;M but you'll do some rehabilitation so it's not an either or whether you put it into C&amp;M.</td>
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<td><strong>B7</strong></td>
<td>When the machinery is off site the staff are no longer there and you're often down to a skeleton staff or C&amp;M staff it's more expensive for them to bring contractors in to do the rehabilitation that is required. Often at that point - we'll not necessarily have a look at the PEPR but we'll have a look at the bond and we'll make sure that the bond is adequate, this is obviously an increased risk when they're in C&amp;M that they might pull the plug and say no we're actually going to walk away from this site, and that's when we'll make sure we've got 100% or 110% of the liability of the government to come in and do the rehabilitation...</td>
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<td><strong>B7</strong></td>
<td>That said there are miners that do put into C&amp;M to try and for stall their rehabilitation requirements and it really depends as a regulator ourselves, how long do we give these miners before they actually have to do their rehabilitation. That's a difficult one for us often we give them a period of time to do the works but you know - dangling I guess the re-opening of the mine or an adjacent mine down the track doesn't mean they don't have to meet their rehabilitation requirements. After a couple of years or so of C&amp;M we'll either be pushing the miner to recommence mining, if that's what they want to do or rehabilitate the site with an aim towards final closure and transitioning to another land use</td>
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Typically mineral leases, or mineral tenements, only renewed with a view that they are going to be mined or rehabilitated you can't hold on to them indefinitely, we take a bit of a dim view in regards to land banking - so holding mineral leases over an area where you're just waiting for the commodity price to recover because at the end of the day it's in the states interest to get somebody to extract these minerals out and obviously get some royalties in an environmentally sustainable way we don't care who does it. If we think the tenement can be extinguished and another miner can peg a claim over the top and re-start mining quicker than the existing miner, we've got no interest in trying to encourage land banking and holding on to that. That said it happens a lot less than some people may think.

As the regulator of the activities, operational or otherwise, we would then require the company to generally submit a C&M plan that obviously comes through and gets approved if appropriate and then we regulate the C&M through that plan.

Even though I regulate nearly 70 activities around the state most of them as small low risk quarries I only have a few of the larger risk mines and thank fully they're ones that are coming out of C&M and starting production again, which is always better to see something working you tend to get better environmental outcomes when you have people on the ground so that's positive in regards to the activities that I regulate.

Generally, its (a pseudo C&M plan) required via our conditions under the land use permit or an environmental protection notice if it's been issued on the site to vary the conditions of the permit. Generally, there is a condition in there for temporary suspension of operational controls, noise, dust, traffic, land access all those kinds of things as well as a closure plan - so all PEPRs are supposed to have a closure plan not all do but they're all supposed to have - closure plan and a progressive rehabilitation plan in there as well. Their monitoring and progressive rehabilitation can still continue under the existing the PEPR, that said if the company goes bankrupt or has been bought out by another party then that's a good opportunity to have a review of the PEPR. So, the PEPR runs on a series of environmental outcomes and criteria so the mining company themselves tell us based on a risk assessment what they think the key environmental objectives their going to meet and what criteria they're going to use. It's based on a site by site basis, there's no set criteria that all mines have to meet although there's a lot of commonality as you can imagine but basically, it's based on how close they are to nearest environmental receptors.

There was a period where I didn't have single operational mine that I was looking after so they were all in care and maintenance or some form of administration and some of those have come out of administration or reopened... I think C&M is seen more as a temporary state, rather than an indefinite, certainly the regulators have come down a lot harder on C&M just leaving the site indefinitely for whenever the miner wants to go back in there... you don't want site where the mining company kind of forgets about it and doesn't really meet its environmental obligations, the government kind of forgets about it and the community kind of says well what's happening with these sites. Both the community and the government have been a lot more proactive on sites in C&M you meet your environmental criteria but you don't sit on them indefinitely, you either progressively rehabilitate and close or look to re-open re-mine again. The length of mining tenure has reduced as well. So where we use to give 21 year mining leases to anyone who asks, now you often get a mine lease for 7, 4 or even 2 years if we think that you're a high risk of not meeting your environmental obligations and often mining leases get cancelled if we think you're not meeting your obligations under your PEPR or you're not going to get back and do the rehabilitation.

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If it’s a case by case - what are the key risks what is the monitoring that needs to occur can we let it drop or not. Again, the starting point for us is - keep doing it like you’re doing it. The onus is on you the company to explain why we would drop anything (monitoring) off.

We've certainly had ones where we've cancelled licenses.

We look through the risks what are the risks that need to be addressed, what are the controls, do the changes that have happened because of going into C&M increase or decrease the controls.

We put the onus on the company if they've been in C&M for a time, why should we believe that you're in C&M. The onus is on you to show us that there is any resource left or there's a good prospect of a resource rather than us. We put the onus on the company if they've been in C&M for a time, why should we believe that you're in C&M.

Because the work plans are quite detailed - the guidance and the policies are used to define the work plan in the first instance at the point of approving or assessing them once they're in place we don't so much look to the guideline as look to the work plan itself which are case by case specific.

The rule we've got is kind of 2 years C&M without concern. Anything longer than that and we say hang on isn't this really just closing down and it's time to start rehabilitating.

The exploration side of things is really handled by MRT so they're the ones who obviously the goal there is to maximise resource recovery, I'm not sure how actively they actually push for it but if you're approving an activity to mine in any given area you want to ensure that they can maximise resource recovery out of that further exploration is obviously encouraged to a point taking into consideration the sensitivities of the environment that you're working in. (Is it applied evenly across all sites in C&M) No. Some sites that have been on C&M, smaller ones, have generally been regulated under just under their current permit or environmental conditions so they continue to do the monitoring if required, covered by the conditions. It's the more complex sites that a larger C&M plan may be required, particularly if there's not going to be any personnel on site. Some of the larger mines have at least kept people on site during the C&M period.

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I think what tends to happen is it tends to get sold rather than go in and out of (of C&M) a lot of times... C&M in a sense says... I can't do this economically I don't quite have the finances to do the next bit of exploration needed you've got two choices - either raise funds or someone else who's got money buys into it. The difficulty of raising funds when you've just turned the site off it's a bit hard to convince investors.... I think the model is much more that a company will take over, that's got a bit deeper pockets or is a bit happier to take the risks and see what happens.

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The other part about C&M is we would check that the company has an adequate bond in place that would be a potential warning sign to us. You know you've gone into C&M the economics might not be as robust as they were it's certainly worth reviewing the bond and seeing whether that should be increased to make sure it's the full amount. Just because the likelihood of them going into receivership is higher when they're in C&M as a rule than when they are operating and making a profit.

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<td>B9</td>
<td>There is no specific C&amp;M policy... it largely comes down to the work plan. So, the guidance for the policies are used in setting the work plan and because we take the conservative approach that you keep managing as though it’s an operating site. That makes us in a pretty robust position - it puts the onus on the company to ask for the change rather than us telling the company what things they need to do when they go into C&amp;M.</td>
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<td>Over 15 years ago. We've had smaller one in the last 5 years, one or two, and when I say smaller ones your talking less than $100,000 to rehabilitate type scale whereas the other ones you're talking in the millions. It is partly because unless the resource is super clearly finished you'll generally find someone else who'll come in behind it... there is a small one we rehabilitated for about $50,000 and we're about to put it back out on the market again... we've got two applications already for a license on the site where someone had walked away because they've gone into receivership. (won't straight from operating to receivership)</td>
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<td>B9</td>
<td>They have to keep operating it as though it’s an operating site, apart from the staffing, which is the area we look most closely at. So, all the obligations are there. So, they know they've still got the obligations it’s just about how many people you need to fulfill those obligations and how well trained they need to be.</td>
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<td>Once you're in C&amp;M you're got no input coming in you've just got costs going out... it’s in your interest to sell it to someone to take the burden off your hands or to get out of it quickly rather than to have more money going out and then go into receivership.</td>
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<td>B9</td>
<td>We use notices for that, we’ve got effectively improvement notices or action or remedial notices... e.g. ..... we put a notice on them saying your staffing is not sufficient. E.g..... in dropping the monitoring we just did that by letter of agreement it was effectively saying we will not enforce that condition in the meantime because you’ve given us a reasonable rationale and rather than do all the paper work - as something that is a reduced risk we could do it that way for an increased risk we would use a notice.</td>
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<td>There were cases like where a major company sold a mine in another state that needed rehabilitating for $1 or something silly like that.</td>
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<td>&lt; They are required to tell us annually what production they’ve had, so if it’s extended C&amp;M we’ll find out about it that because they will be reporting we did nothing this year... We know that some commodities and some sites are very much on the cusp of whether they’re economic or not...</td>
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<td>&lt; So, I think the toolkit is not too bad. It really is more, to me as a regulator, to have active management of it, make sure there’s enough bond in place, make sure we go out, if we find out someone is in C&amp;M go out there early understand their staffing understand the resources they have available to make sure they do it properly and then set out inspection frequency accordingly.</td>
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<td>C&amp;M ... it not a word that’s even used in the Mining Act... there is sometimes some obligation under the Mines Safety Inspection Act to report in terms of status changes of mines. Even C&amp;M doesn’t always fall directly in that it’s more about whether their kind of their leaving the site, whether the site is manned or not manned at the time is really what their reporting about. So what really comes in to play how do we, does that change, like we have a risk based regulatory regime, so we keep a risk ranking on all our projects on all our mine sites, so if we’re aware a status of mine changes that might change the risk ranking depending what the site is like and if the C&amp;M status of the site presents increased risk in some area we want to follow up with the company about. The Mine Closure Plan Guidelines talk about having to demonstrate what you would do in the event of C&amp;M or temporary cessation of mining.</td>
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<td>Sometimes it can happen really quickly that a site will be operating and then it will go into receivership basically it hasn't even had a period of C&amp;M and all of a sudden it stops. So sometimes it can be it can be sudden... What does happen, as I say there is often some financial reasons as to why they are in C&amp;M, so often what happens is that they stop for a while and get more funding or look for other buyers. What's much more common in C&amp;M is that sites will change hands people will take over areas try and make a go of it... there is always a risk that they will go into receivership but often ...they will be operating and go into receivership... that’s happened more commonly... then they go into C&amp;M or something else once they do ... C&amp;M is not an official thing it’s just a term that’s used ...it's not closed and it’s not operating ...some people just called it temporarily closed.</td>
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<td>The other aspect is our mining proposals, especially under the new guidelines which were released in 2016 require people to do an environmental impact assessment and consider all phases of mining which can be planned and unplanned phases so really their risk assessment should identify what the risks are during C&amp;M or a temporary closure phase that may be different from the rest of the phases and they will have management responses that they need to be doing in those phases. In some circumstances we may request a specific plan for managing C&amp;M and essentially regulate them against that plan or impose specific conditions as to what they need to do in that scenario. So really its more just it’s part of our current regulatory regime that we deal with it we don’t have a specific policy that only deals with C&amp;M.</td>
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<td>Sometimes there's some regulatory requirements there as well that we make sure the companies are meeting... It's really a trigger for us to maybe just review the site, see if we need them to do some additional work, provide us with some additional info, do some additional monitoring, if there's basically anything we’re concerned about while it's in its C&amp;M phase rather than operating.</td>
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<td>Gold is a really interesting one a lot of gold mines tend to go through a cycle of being open then closing down then opening back again and closing down and opening up and expanding and mining deeper gold is quite unique in that respect and there are a lot of gold mines in WA.</td>
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<td>Really the regulatory regime doesn't actually change. Whilst the lease is there, they're still required to meet all the obligations regardless of what stage of mining they're at really. So, the obligations stay the same while it’s in its C&amp;M phase rather than operating.</td>
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<td>The way it works, in WA, under the Mining Act, a tenement can basically be sold or transferred to anyone else within reason so say a company has gone into C&amp;M and another companies expressed an interest in taking over the site and they come to a financial arrangement, not that difficult for a company to lodge a transfer of tenure to that new company. As soon as that company</td>
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|      | I’m not aware of a specific policy that’s specific to C&M only what does apply to it mainly is the Mine Proposal Guidelines and the Mine Closure Plan Guidelines and their both statutory guidelines. So, when a proponent wants to mine in an area, they need to lodge a mining proposal it’s a statutory requirement that their
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<td>C&amp;M is that they might not have much money... The regulatory framework is already there, we don't have an additional policy that specifically focuses just on C&amp;M in terms of what needs to be done, with the exception of the Mine Closure Guidelines which do talk about C&amp;M. Takes on the same tenure, they take on all the approvals and obligations that existed. So for them to start mining again if they're going to essentially comply with all of the approvals, just carry on with the same approvals what's actually allowed under those approvals, they can actually start operating again they will just need to notify their safety people that the recommencement of operations. More often than not when a company takes over another tenement the company will want to mine in a slightly different way or change something so often, they need to come to us and get a mining proposal approved to change their operations. Proposal deals with things during C&amp;M as does their Mine Closure Plan.</td>
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<td>&lt; Under the Mining Act there is no specific category called C&amp;M... but we do generally know what's happening with sites because the department has a database called MINEX that we monitor the activities of sites just through all sorts of different mechanisms via just monitoring statements to the market, monitoring annual reports all sort of things that we monitor for the status of the sites. In people's annual environmental reports, they also tick a button to say what the status of the site is. Our Resource Safety area through safety regulation system SRS they do get reported to them what the status of the mine is as well. Generally speaking, the Department has the information it's just not necessarily a specific requirement to have to report it specifically C&amp;M... it's not a term that's used in our legislation. When they have to report to safety is more when they no longer have personnel at the site and it's technically called abandonment, it's not abandonment as in they walked away from the site and disclaimed all liability its more that they've abandoned in terms of the people aren't there anymore. There might just be one or two caretakers there. So that's when they have to report it to our resource safety area. But we do generally speaking still have a record of the status all the sites. When you start looking at individual sites some of them might have commitments or obligations in their approvals that require them to notify us at certain stages but it's not a standard thing across the industry. An interesting one would be, because it's public knowledge as well is the Cliff's iron ore mine in the mid-west in the Yilgarn - they were publicly saying they didn't have a whole heap of years of mine life left and they were doing some progressive rehabilitation on the site, they were doing quite well and then MRL stepped in and they've seen enough value in the remaining mining to keep mining and do the remainder of the rehabilitation and closure works that need to be done.</td>
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Notifications under Mines Safety and Inspection Act 42/88. We tend to look at sites holistically from a C&M perspective more so that just looking at an isolated pit. We wouldn’t get notified down to that level, but would get communicated through annual reports. So we’ll get communication through that process. Some of these sites might just be like a little prospecting or dry blowing type operation, coz MINEDEX captures all mines and all mine features.

- So a pit can be isolated and not mined for a while that doesn’t mean it’s been abandoned or whatever it’s just ‘isolated’ it could be considered C&M but the projects not in C&M might just be that one pit not being mined at that particular point in time. And if it is finalised then there is a process that needs to be gone through and sign off achieved for stating that the site has been left in a condition, that’s acceptable... with a pit for example... that the pits been appropriately bunded or backfilled or made safe, had the walls battered down, depending on what scenario your dealing with. In most of the cases with the deeper pits they tend to be just left as a pit void and it’s not really going to be of any benefit in the future but it needs to be left in a safe condition with an appropriately established abandonment bund around that pit. They can sit like that for many years, decades and then someone can come back in the future and they might recommence mining, some of these might have underground developments at the bottom of the pits... things like seismicity can be a game changer when it comes to long term mining, it may be that it’s not safe at that point in time to go back in, but with improvement or different mining methods there may be the ability to go back in and recommence mining. At some sites it might mean a big cut back, the pits cut back to a safer angle and any problematic material mined out and removed so it will then allow for safe operation at the dept of the pit. The costs of doing that is significant and then economics come into play about how much resource is there and is it economic to cut that pit back to go deeper to get that remaining ore, they’re the decision that are informed through geological models, market conditions. There’s a whole heap of drivers that would control how that occur. They Department and Government don’t really have a hand in that... it’s the company that makes those decision about whether they will go in this pit or not, whether they’ll stop mining here and mine another pit for a period and just suspend mining in the other area.

- Requirements to still meet all of their reporting obligations and any other obligations, they may seek exemptions from particular things like stack monitoring if emissions aren’t occurring, or pressure testing if vessels aren’t operating. C&M is only a temporary cessation of the operations, so it’s not expected that it’s stopping and ceasing, so the expectation is that we don’t require them to remove everything. The difficulty is from a rehabilitation perspective is that their still likely to want to add material to the waste dump and other structures and continue to deposit tailings in the tailing’s storage facility. We can’t force them to rehabilitate.

- Requirements to still meet all of their reporting obligations and any other obligations, they may seek exemptions from particular things like stack monitoring if emissions aren’t occurring, or pressure testing if vessels aren’t operating.

- The annual reports, that obligations remains when a project goes into C&M so there is a requirement to lodge an annual environmental report in accordance with the tenement conditions failure to do so could render the tenement liable for a fine or forfeiture because it’s a legally binding requirement. Things like the battery metals, there was a time where they, and even nickel for example the price of nickel just went through the floor and nickel mines were going into C&M left, right and centre and that was purely driven by the commodity price, so once the commodity price picks up then some of these mines start opening up all over the place. Things like lithium with the demand for batteries we have mines opening up all over the place.

- We’ve got powers under the Act that we can require them to do particular things... it’s either compliance so there’s documentation where they have to do things if they’re not doing it then that’s one process; the other is if what’s happening is called ‘detriment’ and harm to the receiving environment if there’s significant detriment or harm being caused then we have capacity to issue orders such as directions to modify a written order with a time to be met by failure to do that constitutes as a breach of the Act and they can be taken to task on that through the court process. If their breach of conditions, then it could render the tenements liable for forfeiture.

- In most cases there’s been some sort of a problem with the way that the mine was either operated or it hadn’t expanded sufficiently or the processing circuit was obsolete and defunct and that may not have been why the company wasn’t going well in many cases when a new company takes it on there’s a requirement - well they generally lodge and deem them to modify something associated with the mine and that gives us the opportunity to impose further conditions... the Minister can impose conditions at any time there’s no restriction there. And at some stage previously we use to impose a C&M plan requirement as a tenement condition to lock that down as a requirement and get a timeframe to get it lodged by and that can still be done there’s no restriction on that... it tends to be a case by case and what the status and the scenario is for the C&M. There’s so many varied reasons.

- < Under part 5 of the EP Act with works approvals and licenses, we don’t actually regulate the mining, we only regulate the processing of ore. And there are a couple of other categories that are often associated with mining like category 6 for dewatering discharge.
they (companies) don’t have to (notify about going into C&M) by the general provision of any act but there is sometimes a condition on a license that would require them to notify us. These are ones where we’ve identified risks associated with the company going into care and maintenance. It’s usually the types of activity that are a little bit borderline economically. Poor grade or they’ve got some other associated with them that means they don’t make a heap of money or they’ve got quite high costs so they’re likely to go in and out of care and maintenance frequently.

If we were looking at an annual environmental report that’s been submitted. Almost every premises regardless of what they do has to submit an AER, once a year, we generally have a quick look at that to identify whether there’s any flags, any risks as soon as we receive it. Then it goes into a program for more regular assessment based on risks. Through that process we sometimes identify risks associated with care and maintenance or a company being at risk of going into care and maintenance and that having subsequent risks. Then we would do something about that through the assessment. So that would trigger us to do our own initiated assessment and make some changes so that they were required to notify us or that if they were going into C&M, they had a requirement to undertake a certain set of actions. Which might be things like an inventory of all the reagents in storage on site.

So, there’s the premises component fee, there’s the part 2 discharge fee which relates to tailings and dewater discharge. There’s also a part 3 discharge fee which is the actual amount of point source discharges like wastewater treatment plants power station exhausts – all sorts of specific outputs from processes. So that’s another way we can advise us, or the department can become aware that someone’s gone into C&M. But there’s not overall requirement under either statutory or policy for someone to let us know, there are some incentives and there are some mechanisms but no overall requirement.

If they didn’t have those conditions on them that required them to notify us, they may, or they may not notify us. They can if they want to, going through their own due diligence processes. One of the other triggers for people to notify us, is that there are fees associated with annual operations, the start of every annual period which is defined in the license, you have the premises component so that’s based on the category and it’s based on the annual throughput so that can go up and down a lot if you’re talking about something that might be like a 5 million tonne a year operation and they’re going to nothing, they would probably want to pay the lowest fees applicable for the year. So sometimes people come to us and say we’re going into C&M and our annual fee is coming up we want to amend our license down to the lowest level so that we don’t have to pay much in fees.

You’ve got some companies that have been basically in C&M for the entire length of time that I’ve been working in the Department. Which I feel is questionable, and I do feel like the Department should have a policy position on I don’t think that’s reasonable at all. I also wonder how that fits with compliance with tenement expenditure requirements and other things and is that the best outcome for the state having things in really really long-term C&M – I don’t think so. To the extent that you need to keep dewatering pumps running and mills turning over... it’s a terrible waste of resources because you’re not achieving any end goal to try and just stay in one place, jogging on the spot.

I would say probably where abandonment has occurred it has almost always occurred after a period of C&M, but the incidents of abandonment is quite low compared to the incidents of C&M which then those operations go on to resume operations. It’s there as a factor but I don’t think it’s really a major concern. The instances of successfully restarting operations with some added value because things have changed in the period of C&M is probably more so than the abandonment scenario. I know there’s been a couple of high-profile ones lately and there’s also been a lot of completely unknown instances of abandonment, but generally that would be my take on it.

Generally speaking, mines can go in or out of C&M without too many concerns and without there needing to be a regulatory response.
It really varies, on whether or not we’ve had a good look at that premises on the basis of risk. Where things happen during the period that they’re in C&M. Sometimes they might not have any requirements on them, and they can just re-start operations. Other times they’ll have a notification requirement which is just a prompt for us to make sure that nothing really major has changed around that site. Other times they’ll tell us, and we’ll be really concerned, and we’ll send someone out to site we’ll do a compliance inspection we’ll check on the status of the containment infrastructure we might send them some sort of request for information. Potentially in the worst-case scenario’s we might use some form of regulatory notice other than the works approval or the license. If we had real concerns. There’s probably only two or three sites around the state that I would say we’re in that situation with. The majority of sites are managed fairly well.

In our regulatory framework we say we’re risk based… we don’t have a formal level of response to any individual C&M that we’d like to do unless the risks were really high. The best long term outcome… in the short term we do the most immediate and urgent actions to prevent anything really bad and then we try to keep it in a state which is attractive as a viable proposition for someone to come and take over because that will give us a better long term outcome. The states outcome in terms of royalties as well as environmental outcome and liability.

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<th>Int.</th>
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4.3 Risk Factors for mines in C&M

They’re avoiding going into C&M in some cases, there’s others where they are yes in C&M, and I’d say they’re not at high risk of imminent abandonment but almost certainly the parent bodies intention is to avoid their closure obligations, because the closure wasn’t costed into the overall model for the mine when it was built. We’ve got good closure guidelines now that say that it should be done progressively as far as possible and that you have to fund it properly. But 15-20 years ago, we didn’t have those no-one forced people to do it even though it was out there as leading practice you weren’t forced to do it, so people didn’t do it.

The states outcome in terms of royalties as well as environmental outcome and liability.

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4.3 Risk Factors for mines in C&M
So even things like running your pumps to keep the pit dry - do you do that or don’t you? If you don’t you have a drowning hazard, you’ve also got a substantial amount of water to get out of the pit before you could start operating again which could be a hurdle for some companies.

Monitoring is another one as well, so if you know things have been left in a hurry are there monitoring commitments that need to be maintained in the long term, who’s doing those? whose got responsibility for that? From an environmental perspective.

I’ve had to manage a C&M site myself, for quite some time and one of things I checked without legal department was where do we stand if we’ve put signage on clearly saying that it’s an offence to enter the site and people choose to do, where do we sit from a legal perspective and the advice given was that was well legally we’re covered. However, if we then go and do an inspection and find out that the security measures have been breached and the signs have been removed or the gates have been opened then we have a duty of care to rectify that issue. However, if everything is all locked up and people choose to climb over a fence then legally, we’re fine however reputationally especially for the majors that’s where the damage would come in.

There was also a fatality last year as well in Redhill(?!) quarry just outside Perth and that’s an abandoned quarry up in the Perth hills and that was a tourist who jumped in the water and didn’t get back out.

So, if we’re talking about true care and maintenance, you’re not going to demolish you’re infrastructure because you intend to use it again then you need to have integrity inspections and maintenance work completed. So, I know at one of our sites in Port Headland, it wasn’t a closed site, it was a piece of redundant infrastructure that rather than pull it down the cost was deferred for many many years. It wasn’t an inexpensive job. What happened over time the cost of maintaining it to a safe standard, because it was in the middle of a work area, basically said that it, this didn’t make sense, once you did the NPVs (net present value) on it, it actually said spend the money and take it down rather than manage it for that extended period. So, you know you’ve got issues with cyclones as an example so if you’re not maintaining your infrastructure it becomes a hazard.

To be honest I don’t think it’s done in many cases (infrastructure being maintained). If you think of the context of a mine where the operators become insolvent... (Ellendale diamond mine in the Kimberley WA example) so they went insolvent so there is still all the infrastructure up there the hope from the government is someone will come in and start it up again now because the operator has gone insolvent who is actually doing that care and maintenance activity? The government is doing some minimal work in terms of mine and contaminated site etc. but have they got an established inspection schedule I don’t know the newer but you would expect they should if it’s true C&M... if there’s an opportunity for them to start the mine up again then it makes sense to maintain the infrastructure.
you want to make sure everything is operating there so it doesn’t flood and your worried about water run off around the place and not just from when it rains and polluting the environment, here in WA when it decides to rain every now and then with those cyclones man those can do some damage. There’s plenty of examples where mines that were operating very very well a cyclone comes through and they shut you’ve seen pictures of pits just full of water to the brim. So, a lot of us put a lot of work into ok if there’s a flood how do we make sure all of this water doesn’t head into this big hole we’ve created how does it go around it. Just maintaining water, infrastructure the TSF, that’s pretty much it. It’s not hard it’s pretty simple. What we do is not rocket science - we’re not sending people to the moon we’re just maintaining physical infrastructure it’s pretty easy to do with a modicum of thought.

One of the key things you have to look at other than once you’ve removed you’re hazardous chemicals so your fuels and those sorts of things, you’re key risks then are going to basically sit with things like tailings dams so you need to be aware of how much water you’ve got on the tailings dam do you have sufficient freeboard, what’s going to happen to that tailings dam over that period of C&M. Generally, you’ll find that the water will evaporate, and your tailings will start to consolidate which is fine so from a potential tailings dam failure, unless you’ve got water coming into your dam other than rainfall then you’re probably ok. Generally, if you’ve got some sort of seepage or leachate from your dam C&M can actually be a good thing. Because you won’t be contributing to it over that period of time, it can be a good opportunity to find out the nature of what the seepage truly is. So you wouldn’t expect anything additional in terms of impact, you’re not doing any more clearing, you don’t have any fugitive emissions or any of those sorts of things so most of your licensed activities would have stopped, you’re not producing waste, you’re not producing tailings, you’re not producing emissions out of the stack so generally it’s a very low impact activity. Provided things are maintained, you know for extended periods of time then things like you know erosion of tailings dams or those sorts of things could potentially become a problem.

Also, companies through the C&M period need to meet all their environmental conditions that continues to apply right through that period. Environmental monitoring is likely to continue, land management is likely to continue for example fire and weed management, certainly management of safety need to continue… it’s just the direct operations that don’t progress. Perhaps some of those issues the intensity of work on some of those other matters whether it be environmental monitoring and others might decrease. For example, if their monitoring air emissions and there’s no operations they can start winding that back. They certainly need to keep the core of their environmental conditions met without a full complement staff presence, depending where your mine site is, you do open yourself up to other issues.

You might change the way you manage the environment on site, for example if you’re not using a pit you might be dewatering a pit you need to make some big decision on how you’re going to continue to manage groundwater during C&M keeping in mind that it can be quite expensive to manage groundwater, Therefore you may choose to operate in a different manner, that might be dewatering less that might just be changing tack in terms of how you approach the risks on site. Risks can change, that might mean you need to implement additional safety measures for example if you’ve got a water body on site.

and you probably need to have a bit of a re-think on how you manage your environmental factors well.
When they do go into C&M primarily, we don’t normally have anything to do with dust monitoring or air monitoring because in that C&M mode there’s no activity occurring on the site, or there shouldn’t be. Our primary responsibility is looking at surface and would sometimes include the groundwater… but it is still managing surface storm water and groundwater and looking at volume and quality control on those water resources. And at the same time ensuring management of those surface and groundwater – your still ensuring proper management and care of those facilities that are storing the waste from the mining activities. So, the tailings dams are monitored, we have monitoring bores around them. There’s a dam’s safety committee in NSW, linked to the mine section, so they ensure the integrity of those tailings dams is maintained and monitored. They actually classify the dams according to their risk level – environmental and human…. Those things are still occurring even though a mine is in C&M they’re looking at those factors to ensure safety in the environment and safety for humans too for the community.

Quite often the mining licenses require them to still have staff on site to maintain the facilities, so they are still required to have a manager on site and an environmental officer and things like that. You might have a site which might normally have 100 odd staff or more when it’s operating but even in a C&M mode they’re still required to have might only be 4 or 5 e people, but those people must be there and be adequate enough to maintain what needs to be maintained, to ensure environment controls are maintained as well as safety aspects are maintained – boundary fences or gates maintained from people wondering in.

- Other things that we’ve sort of encountered that have to be manage when the sites in C&M mode and not operating there’s is obviously noxious weeds and the feral animals. All that’s not specifically mentioned on the license, other agencies also require the mine that has control of these areas to still manage those issues, even if there’s just 3 or 4 people out there.

As far as our policies go they really are linked to the legislation… when they’re in care and maintenance mode certainly we still require them to monitor and control in some way any issues with contaminated water, surface water, or tailings dams that might be filled with toxic waste and also the weeds and animals and so forth, they’re still are required to manage those. If they’re going to retain that site for possible future use or for sale, we expect them to still maintain those other areas within the mine site.

The higher risk ones normally, I suppose they’re not as high risk as they use to be as in that they are managed better than w

Water balance is probably the main thing that we need to deal with…

- Depends on the site, where it is … is it metalliferous is it coal, so there’s a whole range of risks could be anything from acid drainage through to failure of reveg, through to landform stability or instability, visual amenity - a whole range of matters. Depends on the scale and the nature of the site.

People who knew about the ins and outs of the plant moved on - that’s a significant issue on many sites. “Plants rarely seem to be built exactly as designed and quite often as constructed drawings don’t get done or don’t get filed properly and so you rely very much on the old hands remembering where pipes run, or which valve did what. And if they move on it becomes very difficult to efficiently restart a plant.

- Obviously, water management and waste management continue and there needs to be a programme for those activities that we can assess.

You’re not going to be paying a large number of people, as I say, most sites that I can think of the crew that last longest is the rehab crew. So, the environment people to do the monitoring and to get on with the rehabilitation and revegetation. But the mining crew nope, they’re gone they're off earning money somewhere else.

- You don’t care so much about mobile plant, because quite often now a days that’s the property of a third party. You will often contract mining, so it’s my mine but it’s your trucks and diggers, so when the mining stops you take them away. But there will be chemical supplies, fuel supplies that need to be monitored so that you know there’s no risk of environmental spills and so on.

Look it’s hard. In my experience if you shut a plant down for more than a year or two it’s very difficult to restart unless you've had a fairly intensive, active, maintenance program. An example would be you stop the mill, you clean the mill out then and then it stops again and if you don’t run the mill periodically then it will sit, things may rust, bearings may take a set. It’s like if you park a car and you don’t move it the tyres will take on a flat side, you know what I mean.

My experience has been, not only in this country but overseas where someone said “oh you know we look after the mill” well what they meant is there’s a
You're looking at what are the risks, if you go into C&M what are the risks is it some chemicals, fuels materials in storage, is it contamination arising from waste rock dumps, is it pits that back fill with water that becomes acidic or whatever; your looking for what are the risks and how are they going to be managed. How are you going to ensure, as an operator that you're not going to have a lasting impact, adverse impact on the environment just because you've stopped operations. We'll look at what the resourcing proposal is, someone says right we're going to close it down we've got a great C&M programs and it includes one-night watchman... it happens. And you say well hang on guys we're looking for a program with a bit more body to it, like who's going to do the monitoring who's going to be looking after reveg, sometimes who's looking after water treatment.

I've seen a plant where I think the company genuinely believed in one to two years' time, they might have been able to restart, it became obvious that that wasn't going to happen. And then in that time they had been running a very active maintenance program but as it became obvious that the situation and market were not going to change to their advantage they fairly quickly went to a minimalist maintenance program and then it was just a question of when to make the very serious decision "ok now we're going to take it apart, we're not going to recommission this plant and now we have to working on decommissioning, dismantling, disposal." But if you've spent 300 / 400 million on a mill and process plant and you run it for 10-12 years and then it sits idle for 3/4 years, any chance you have to make money when the commodity price comes back up is going to be controlled by your ability to re-use that plant with minimal additional expenditure. If someone says right the price of gold has lept up you can restart but you need to employ the xyz process and you look at your plant and think to retrofit the xyz process it's going to cost another 200 million, it's not going to happen, i'm better off cutting my losses. It may be you could restart the plant work it as a less efficient way as long as you still making money with the hope that you could offset some of your costs against other operations, tax wise, if you're a multiple tenement holder or big mining house - but they are fairly few and far between those situations, I can't think of one immediately.

Water management particularly up here... you know you get 1 meter or 2 of rain a year in 6 months, water management becomes a critical activity at most mine sites in the top end. If you've got contaminated water and have containments, how are they managed or how is it planned to be managed so you don't have problems.

So, from our perspective, particularly when we are in QLD, most of our mines are in the North West Mineral province so Mt Isa - that area. The biggest risk are around wet season and they are making sure that they have sufficient capacity in their tailings dams and water dams to survive a wet season, that they can actually pump water out if they need to or keep water on site. Look at how they might progress any rehabilitation aspects. Water management and waste management are the two big things so what are they doing with their waste rock dumps - are they closing them out; what are they doing with the tailings dam while it's not being used and particularly managing risk through the wet season.

The pumping infrastructure, environmental monitoring all those things that you know are they think are nice things to do things as opposed to trying to... so surviving the wet season is pretty hard for them without an issue.

So we set a lot of outcome focused conditions as you probably realised we've gone down the outcome focused scenario so we basically said this is the outcome we want you need to manage your site we would put that on an inspection list we would perceive them to be higher risk so we would want them inspected more often and our compliance and we would look at them more closely because they're in C&M and they are higher risk sites to us.

You can't. The bit about that I think is that it's a commercial issue and its corporation law right that's not environmental law it sits outside our a) area of expertise and b) our area of influence in terms of the finances. We generally try and alleviate any chance you have to restart the markets change and the price of a mine, but it still needs to meet our environmental standards and if they can't well no offence, but they probably shouldn't be in business.

We've only been involved in a couple and mainly for us, because what we look at is water effecting activities, so therefore it was the surface water and it was making sure that those structure that were put in place were maintained while they were in maintenance mode, because they were what was stopping huge amounts of water coming into their pits or actually washing out some of their existing infrastructure, so it's probably in their benefit to maintain as well. Because we're talking about an arid zone you can get 76 mils of rain in ten minutes or in 5 minutes in some cases... because of those high rainfall events and our rivers and creeks tend to flood quite quickly so it's really important that that maintenance is ongoing... after an event they actually go back and reinstate and address anything that happened - otherwise you end up with massive erosion - that's one of the considerations that we look at and the other is obviously collecting water and dispersal of... because collecting water we can have feral animal management issues as well as domestic livestock issues but generally it's the feral and where there is a source of water you can get an increase in problems, so that can actually impact neighbours... and the other is with the water movement is the weeds - depending on where the site is, some sites are actually relatively weed free so it's not such a big issue but others in higher sites where there's probably more prevalence of weed species then there is a degree of maintenance that needs to happen to ensure that bunds are in place so that the water isn't actually moving across areas where weed species are and distributing seed.
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<td>B6</td>
<td>There might be some weed and feral animal management stuff that comes into that... if it goes into C&amp;M and there was already dewatering happening there might actually be a requirement to continue to dewater and then find an alternative location to dispose that water because the mines not being active... they look at what was happening at that site prior to closure (C&amp;M) and were there things that were ongoing that needed to be continued and ongoing while in C&amp;M so some things it’s a matter of simply bunding and making sure it’s maintained where other might be that you need to continue pumping water from the site, or you accept that there’s going to be a risk of contamination and then that would bring in our EPA as well... they’ve got a license system and their license system has really particular conditions in there so probably a degree stronger in terms of being able to say no you need to do this, this and this while in C&amp;M. There’s a few different agencies involved depending on the risk that’s there posed by that closure.</td>
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<td>B7</td>
<td>When a mine goes into C&amp;M they lose 99% of their staff usually, you also lose a lot of expertise, plans, programs they all get lost there’s not a lot of continuity you can get bought out by a smaller miner and so at that time if someone else buys it out while they’re in C&amp;M you have to look at if they have the capability and the capacity not just to do the mining but to do the rehabilitation as well. That’s one of the key things when they go into C&amp;M is how does their capacity to do the rehabilitation change and making sure the bond reflects that even if the PEPR, the environmental criteria that they have to meet remains the same.</td>
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<td>B8</td>
<td>Others things are you know obviously you’ve got a mine in C&amp;M you need to make sure it’s safe and secure especially if you’re in an area around metro cities you know where you might get kids or people coming into there you’ve got to make sure that the fencing and bunds around pits, pit walls are safe and secure if there’s going to be a pit lake obviously that needs to be controlled as well... a lot of it is basically making the site secure for whatever period it’s in C&amp;M or whether it goes straight into rehabilitation or abandonment... if no-one’s going to really be out there to police the site and keep people away then you’ve got to make sure it’s as safe as possible.</td>
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<td>Obviously dependent on the site but generally down here water is a real issue. We’re obviously quite a wet environment for the most part, particularly where some of our larger mines are, so water discharges are one of our biggest risks particularly when you’ve got tailings management as well, large TSF, that’s where our biggest risk lies and acid and metalliferous drainage from those tailings if they’re not monitored or kept inundated. So, water is probably our biggest risk on most of those sites that are under C&amp;M. Weed and disease management is also a focus whilst in C&amp;M.</td>
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<td>The few that I’ve been involved with of late that have out of C&amp;M into production, they’ve been managed pretty well during the C&amp;M period so we didn’t have too many issues during that time so the ramping up of operations hasn’t really seen any changes to water quality and that sort of stuff because it’s been maintained pretty well over that time... and the majority of those sites most of the water monitoring was maintained as per the original requirements anyway so there weren’t really any changes in that regard...</td>
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<td>one of the ones that’s just started reprocessing, over the C&amp;M period the activity was sold. The new company that came in to restart it managed to lift the quality of the discharge from the TSF markedly over what had previously been dealt with under C&amp;M. While the activity wasn’t compliant in many discharge areas a couple of parameters they struggled to get where they needed to be. The new operator has come on board and got that ticking in the right direction.</td>
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<td>We have the (State Policy on Water Quality Management 1997). This is the overarching policy that govern all water quality management in Tasmania not specifically for mines.</td>
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<td>unless otherwise specified under the conditions, they have to meet these water quality objectives and policies as with any other activity in the state.</td>
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<td>Everything we do is based on environmental risk so we go through a process for any of our regulated activities of giving them a risk rating and that’s based on environmental risk as in the actual risk to the environment, or management history so there’s a large matrix that we go through and they come up with a risk rating and priority is given to those activities that have a higher environmental risk compared to the low risk activities that come out of little quarries...</td>
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<td>You’d look at the size and complexity of the activity the receiving environment, the nearest sensitive receptors - residences that sort of stuff, you’d look at their management and compliance history and that sort of stuff and that sort of builds in to that matrix which is scored and you come out basically with a score on risk and that’s guess a quantitative way of doing it there’s also a subjective view you get to work with the sites you get to understand really where the risks are. So those scores may not be completely indicative of where the risks is but it’s certainly a tool that’s used to prioritise.</td>
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The other one is are there any activities that require ongoing attention. An example is the way the water management occurs - its erosive materials and we could get instability in the beds if the water management isn’t maintained... they turned the staffing right down to half a dozen people for an area that used to have over 100 people working there and they were almost pretty much security guards. So, the question was in terms of the monitoring did they have sufficiently trained people and sufficient number of people to do the job... we had a situation not long after they went into C&M where there was a heavy rainfall and they didn’t pick up an issue where a drain had blocked, and we started to get erosion occurring. As it was we happened to pick that up a day or two after that rain event and we asked the company to increase the amount of monitoring and increase the amount of reporting and increase the training for the security guards who weren’t as clear as to what they were looking for... the monitoring use to be done by a lot of experienced people... it’s a lot more vulnerable when it goes back to a skeleton staff that there’s a risk that key maintenance duties or key environmental or public safety risks won’t be in place.

The other one then would be the security of the site... had quite a lot of people entering the site without permission. Tech CCTV shows them after the event. In the past there would of always been workers around and no-one would of thought of going on the site... the company has got an obligation to provide a secure site. So that security issue is heightened with no-one around

With coal mines you’ve got the risk of fire, in the past the logic was somewhat that they had people to spot fires because there were always people in the mine even overnight, winning coal and other things... if there’s no-one there watching for it what have they got in place, do they put some technology in place, or do they need to keep some extra people on site to do the fire spotting in different weather conditions.

Part of what helps a company to tolerate a mine is the employment it provides... The acceptability of the company or the toleration of the company is not the same as it was because it’s not giving the same benefits.

It’s largely their own, there’s a minimum requirement from government, but generally they’re at least that if not more because they do see it, at least the big ones, as a benefit and credibility and they understand that these are large projects and because of the community engagement compared to the cost of rehabilitation is quite small.

They went down basically an exploration crew to be able to re-open they had to find more gold so they did have a dozen people there at the minimum but most of those dozen people were exploration geologists or drillers and not necessarily the same people who would know how to maintain some of the monitoring equipment and the like.

For general C&M I think it’s just a question of staying in touch with the community understanding that their expectations will change and they’ll get use to having a not operating mine next to them and they might have something to say when it starts operating again, balanced with the fact that there’s extra employment brought in they’ll be pleased with that.

they apply tailings after the processing, it’s a cyanide leach process and therefore the tailings contain some cyanide. As part of the monitoring program they needed to monitor cyanide in the air above the tailings dam because there are neighbours not far away... they kept it going for another 6 months after they finished applying tailings, because they’re in C&M they still have the tailings dam but there were no fresh tailings going in and after 6 months of monitoring showing that the results were ‘not detect’ they put it to us that we can turn this program off until we start applying tailings again and we agreed to that... however, the groundwater monitoring under the tailings dam - it’s about making sure what seepage is coming through - we say that has to continue - you might have stopped putting things in the top, but things haven’t stopped seeping out the bottom.

A lot of sites are different some sites it may not present an immediate environmental risk a site being in C&M it might just be more of a long term risk as to whether it’s ever going to open up again and therefore rehabilitated properly. Some sites there can be short term risks while it’s in C&M because there might be things like active dewatering that are done at the site that when it’s not done present different environmental risks and challenges to the site. There might be other things around active management of environmental issues at the site.

When they have to report to safety is more when they no longer have personnel at the site and it’s technically called abandonment, it’s not abandonment as in they walked away from the site and disclaimed all liability its more that they’ve abandoned in terms of the people aren’t there anymore. There might just be one or two care takers there. So that’s when they have to report it to our resource safety area. But we do generally speaking still have a record of the status all the sites.

Usually it’s around in there problematic materials at the site that need active management, sometimes that can be more along the lines of chemicals and things like that being stored at the site, so the site goes into C&M and say they have an acid plant on site then if that’s going to get stored... if it’s not going to be actively managed potentially because not all the same operational person are going to be around and it stays in C&M for a while storage of chemicals can deteriorate over time if it’s not managed properly.
For some sites they may have to have dewatering to allow mining and when they're dewatering it can change some of the geotechnical risks around the site so if you suddenly stop dewatering or you dewater in a different fashion or you change the rate of dewatering it might present some stability risks for the mine pit and things like that. Our resource safety colleagues will look at that as well.

For example we have some sites, their pretty rare but there are a couple of sites that operate on offshore islands and they actually have a seawall... and they actually dewater seawater to dig their pit and ten if they go into C&M it's going to fill up with seawater again so it just changes some of the geotechnical risks. Even though sometimes the risks are actually higher while they're operating, but when they're not operating, we've still got to make sure their managing everything appropriately and make sure there's no increased risk to the environment, I guess.

Tailings storage facilities, sometimes they can dust.... It's a big issue in C&M if they dry out and they can cause dusting problems? Often when a site is operating, they're actively pumping tailings in there which is quite wet you don't get dusting problems. If it all dries out over time you can get quite bad dusting from TSF which are in C&M.

Things like tailings storage facilities need to have an appropriately qualified person like a geotechnical engineer to review the structural integrity of those types of engineered structures to ensure that they are sound and that they're operating or their in a condition that's considered to be acceptable and safe it could include looking at whether the ___fistic__ surface sits within the tailings profile which is the water layer within the tailings storage facility and where that sits in relation to the external embankment. There's monitoring structures like picometres that exist around the embankments which can be used to determine that. Surveying of the upper surface to look at any settlement and consolidation that's occurring on those structures, so there's a whole heap of points that need to be considered in relation to tailings storage facility we've got checklists in our guidance material.... Things like waste dumps if there's big erosion gullies and there's discharge of sediment into the receiving environment that's unlikely to be acceptable and they'll need to come up and manage that and address those sorts of issues if it's causing problems. It could be dusting there might be impacts just because there's no activity occurring on the site there could be dust lifting off tailings SF or off waste dumps or off other disturbed area and that could be having adverse impacts to the receiving environment maybe some other occupied dwelling or people in the area impacts to road traffic depending on where it is and the nature of the site is. And in those cases there will be need to suppress the dust, manage that dust, it might be through adding a binder and putting a suppressant on, it might be through watering and keeping surfaces damp in most cases they will add some sort of a binder a stabilise that structure. Or it might be deemed that that facility is finished with and they might come in and cap it out and close it out. It just depends. It might be an old cell of a tailings storage facility that's completed ... at some stage it's got to be capped out anyway so much that might be the opportune time, we've had that happen while sites have been in C&M, they've decided to cap it rather than trying to use a temporary suppressant option.

There's obligations from the principal employer and the registered manager to have appropriate personnel on site for the status of the site, it really depends on what the risks and what's there. In most cases there will be electrical installations still, so there will be a need to be a qualified electrical person, there is a need to have a registered manager, but that registered manager may be the electrical person. Then for things specific like doing reviews or inspections of engineered structures there is a need and a requirement to have a suitably qualified and competent person. In the wording it talks about the need to have appropriately competent people on the site to manage whatever those particular risks are, and hazards are - depending on what they are we will depend on the number of people that they have...

A lot of the processing plant infrastructure is built from steel and if it's just left in abeyance for a period of time it can fall into disrepair so it's in their best interest to make sure that they do keep the plant moving and operating and turning, they're turning the bore mills for example, running conveyor systems just to keep the lubrication keep the systems moving, if it's just left and not managed it will end up costing a lot of money to recommence if they want to start up again in the future or when they do start up in the future the fact that these structure might need to be replaced or knocked down or significant money spent to fix them. Keeping the paint up, protection for things that might be prone to rust or degradation, managing those things is critical.

Things like storage of chemicals, hydrocarbons, services that are provided to the mine - there might be a high pressure gas supply that goes in, there may be need to turn off that gas supply and isolate it so that it's not feeding all the areas within the processing plant. There's chemicals such as cyanide for gold processing the removal of that if it's going to be sitting around in C&M for an unknown period of time and unlikely to recommence in a short period of time the removal of that cyanide..... there's things such as explosives and explosives magazines in other areas that may need to have recovered and removed off site, acids and processing liquors need to be dealt with, so its left in a state that's safe and not polluting and is not creating any adverse environmental impacts or safety impacts.

The majority of incidents that we see relating to companies in C&M are loss of containment of long-term storage for things like sulphuric acid, process reagents rather than waste.
## 4.4 Regulatory Reform and Definition

### Int.

I struggle to see what it could be because of the reactive nature of it. I think the only way you could regulate it would be obviously through bonds is one thing but also to focus on better planning. As I said before doing your progressive closure work, and I use progressive closure rather the progressive rehab because the rehab is just the icing on the cake at the end. For me it all comes back down to what the closure plans are that companies submit at the time of the original permits. So, if they've got very good process on progressive closure - and that ranges from doing your technical studies, doing active in the field earth works, better planning then that puts everyone in a much better space. Otherwise reactive stuff isn't going to help anyone. That's what the bonds are for, the reactive situation.

I think just that piece on potential resource sanitisation how that can be a disincentive to do closure activity. Not just for companies but also for government. So, you know the governments in a strange situation where they've got a dual role where one is to protect the environment but the other one is to have that ongoing economic benefit. So yes, you want to protect the environment, but you don't want to sterilise the resource that's there for the nation.

### A1

There needs to be better definition and criteria around what is C&M. The government needs to define what it accepts as C&M. So a company needs to be able to demonstrate you know it's gone into C&M because of a shift in the market price or there needs to be some reasons, you know so a company needs to say 'ok we've met those criteria to say that we're in C&M. I would think that's the first thing - otherwise people can just use it willy nilly. The second is - the current regs here in WA are pretty good in the sense that they say once you cease production you have to notify DMIRS that you've ceased production and you have to put in place a C&M plan. So, the next step is that they have to give some guidelines as to what the C&M does. Then I guess some guidance around what happens around during that process; are there some key milestones - if a site is on C&M for 5 years should the criteria change - well if you go beyond that point well then a new set of criteria come into play around what needs to be done, and then maybe again at 10 years... that might be that for the first 5 years you put in place - you've just got to basically de-energise the plant, or potentially sort of say well maybe not de-energise the plant, you've actually got to turn the power off to the plant you know go into a sort second phase of C&M. Then maybe after 50 years ok well you've actually got to remove the plant and do your rehabilitation but there's no expectation that you're going to go into a relinquishment sort of phase if you like. Your basically just cleaning the site up so it's still available for use at some point. Just some ideas, I guess. I would think that those are the sort of things I'd like to see or expect to see.

### A3

There's massive happening there (QLD) and the fear is that progressive divestment to an operation increase the risk of abandonment. So effectively you know you're selling down to the lowest common denominator - what everyone calls the dollar sale and liability is being passed to effectively to people are not able to carry that liability and the government has no recourse. In terms of how the government prevents that from happening they can put tighter controls in place for the sale of assets, the problem that they have with that is that their going to start to then introduce what's called a sovereign risk which means that you won't be able to sell the resource in Australia because they say that there is deterrent to make effective corporate decisions should they wish to divest an asset. If there's a constraint on them they'll consider that to be to their detriment. So, there's a balance that needs to be had.

It is interesting there are two ways that junior companies operate. So often you'll find that junior companies will be exploration focused and they will be the ones they will sell the resource to a company. Often you will find that the resource is found and then they will stake the resource. There are a lot of differences or cultural differences around terminology. There are people that use C&M in that post closure sense. In Australia it tends to be called 'post closure period' or 'monitoring and maintenance'. They may be the people who want to call it 'temporary closure'. There are a lot of differences or cultural differences around terminology. There are people that use C&M in that post closure sense. In Australia it tends to be called 'post closure period' or 'monitoring and maintenance'. They may be the people who want to call it 'temporary closure'.

I think we're too much at the behemoth . If the market starts to boom and increase and there's money then people get in there and explore and mine and governments won't stop them because it's not in there interest and that's part of capitalism and democracy and all of those sorts of wonderful things. It's not until markets start to downtown that pressure comes back on the regulation and these issues start to arise. Over the last 5 or 6 years we've seen a strong focus in on closure and C&M and those sorts of things and that's all disappearing at the moment because the markets starting to boom again and so people say oh we don't have to worry about that anymore. But as soon as the market turns again it'll be back on the agenda.

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### A3

Yeah, because generally at the moment there's no, the only approval you need is you need to put in a mining proposal which is pretty well straightforward. But again, you're introducing a constraint on development or on mining that might introduce a sovereign risk. It's a difficult process to sort of say well look it's appropriate for this company to operate a mine, that's just not done. If they've got some sort of criteria around, I guess who can operate a mine then that can apply to both a sort of a divestment scenario as well as a development scenario. But again, you're introducing a constraint on development or on mining that might introduce a sovereign risk. It's a difficult position for the government to be in. They want to develop mining as an industry so therefore the Mining Acts are effectively set up to encourage mining their not set up to manage the closure of mines, but I think ultimately well head that way - I think we'll see a lot more regulation a lot more legislation around how mines are closed and managed, I think we have to.

In WA C&M is a defined term within the guidelines for preparing closure plans and it's also a defined term within the Act. There is a requirement in WA that when companies cease production, they are required to present a notice to the Department of Mines, and they are required to submit a C&M plan. Now there's no guidance on what that means, or what's in the C&M plan, but they are required to put one together.

### A3

I think we're too much at the behemoth of the market. If the market starts to boom and increase and there's money then people get in there and explore and mine and governments won't stop them because it's not in there interest and that's part of capitalism and democracy and all of those sorts of wonderful things. It's not until markets start to downturn that pressure comes back on the regulation and these issues start to arise. Over the last 5 or 6 years we've seen a strong focus in on closure and C&M and those sorts of things and that's all disappearing at the moment because the markets starting to boom again and so people say oh we don't have to worry about that anymore. But as soon as the market turns again it'll be back on the agenda.

There needs to be better definition and criteria around what is C&M. The government needs to define what it accepts as C&M. So a company needs to be able to demonstrate you know it's gone into C&M because of a shift in the market price or there needs to be some reasons, you know so a company needs to say 'ok we've met those criteria to say that we're in C&M. I would think that's the first thing - otherwise people can just use it willy nilly.

### "Care and Maintenance" definition

So if it is true C&M and that you do intend to start up again, this is an interesting angle right C&M … to me means that you absolutely plan to start up again if you don’t then it’s closed or it’s pre closure. So, consistency in terminology is really important. So, you’ve got C&M, you’ve got pre closure and you have abandoned mines. Three very different things.
Their fear is that if they get in and start to actually dictate policy and standards around some of this stuff, not only will you create a sovereign risk but if they get it wrong they created a way for companies to get out. If they come in and put in a standard that down the track proves to be incorrect or inappropriate, then they will end up in the situation anyway. Which is why we often find that they will put it back to the company and say well ‘you tell us what you’re going to do and how you’re going to do it and then we’ll decide whether or not we’re going to accept it’ part of the big issue that we have is that the government has never accepted what the companies have come back with. The industry wants certainty. They want the certainty of being able to develop, operate and close the mine and move on to the next one, that’s what they’re looking for.

We haven’t got a position on what we want C&M to be, it’s an important tool for companies to be able to pause operations based on economics. Without a doubt the mining industry is quite cyclical compared to other types of industries, the ability to pause operations is absolutely critical to the viability of a mine. It’s a very big decision but ultimately, they need to be able to pause. Unlike agriculture for example if they’re not doing well out of a corner they might try to grow something else next year depending on what’s making the money which is completely understandable. We don’t have the luxury of switching the commodity that comes out of our particular hole in the ground, it’s really important. Our view is that there needs to be all the right safeguards in place, which we understand they are, we need to make sure we continue to meet all our health and safety and environmental requirements that’s really critical. Other than a general position ensuring that the responsibilities and obligations of the owner are being carried out appropriately that it’s seen for what it is and that it continues to be allowed and C&M provision continue to be understood and accommodated by regulators then we’re pretty comfortable with that.

In terms of the relationship between C&M and premature closure, you shouldn’t presume that C&M is premature closure. C&M is quite specific to a temporary pause in mining activities. That said, it’s not out of the question that a mine may make a decision after a period of C&M where they are hoping the commodity price will pick up or their costs structure will come down, it doesn’t turn there’s a pretty good chance they’ll have this mine in C&M for a much longer time and they may make a decision to close that mine if that’s the case. Certainly, until that decision is made it’s not premature closure of the mine.

We're going through a reform process; we're actually modifying the way in terms of how we regulate rehabilitation. (reference standard practice in the industry but it is a concern that people are conflating with abandonment because it shouldn’t be the case so I think a greater understanding of what C&M is would be useful.

Effective what our rehabilitation reform process is we're changing title conditions across all title holders for Mining operation, getting rid of MOD and being more targeted in terms of requiring everybody to have a rehabilitation plan. So, a rehabilitation management plan is effectively a mine closure plan and it's designed to become more detailed towards closure. It depends on what we're doing, as a rehabilitation plan, we approve the outcomes of the rehabilitation plan so their final land use and rehab objectives and completion criteria and their final landform plan. That's the aspect that we approve and hold them to account to. Where the rest of the document is really the framework in terms of how they approach rehabilitation at any given site, what risks they've got and what processes they're going to adopt through the whole life cycle of the operation to actually achieve those rehab outcomes.

What we'll be requiring from title holder is that every year what they do is they submit an annual rehabilitation report and forward program so what that report does is looks back on the last 12 months how’s rehabilitation going is it on track to meet the rehab objectives and completion criteria are they effectively or progressively rehabbing and then what they do is also provide us a forward schedule so a 3 yearly schedule and effectively it's a rolling 3 yearly schedule so we hold them to account to that schedule on a yearly basis. So that's progressive rehab on the ground what monitoring are they going to be doing what studies are they going to be doing with the objective of meeting rehab in a timely fashion.... What effectively that does is that frees us up as regulators to actually get out on the ground and see well what they're doing on site - is it effective - and we can utilise our range extra powers such as issuing notices for them to comply with to address particular aspects of rehab.
It's really to make sure we're more effective in our regulatory processes. So, at the moment we're really bogged down in approving MOPs... Because you have to operate in accordance with an approved MOP - the content of that is basically they describe exactly how they're going to do rehab... you know I'm going to deep rip 300mil I'm going to seed this time of year and what happens is that rehab is a science so if there's a risk that emerges and it's not exactly what they said how they're going to address it in the MOPs then technically if they don't follow the MOP then they're in non-compliance with that MOP. They may be modifying it to actually get a better outcome but they have to go through the whole process again of actually updating their MOP and submit it to us for approval... what we're effectively doing is focusing on the actual outcomes you'd be achieving but allowing innovation and a bit more flexibility in terms of how to get there. It's going to be an improved process for industry but will also free up our resources instead of being bogged down in desks approving MOPs and get out on the ground and actual regulating and looking at how they're performing on the ground. Which is a better place to be.

That's a difficult one to answer (Benefits of being in C&M?). Every site is unique. Each project you have to look at as an individual. There are some sites where you think, ok they're in C&M because the commodity price is down, they were a good efficient operation; if commodity price picks up in a year or two yes, they could start again. But for the most part I think C&M is probably not really not advantageous.

C&M is an option, but I think it's not a very long-term option, whether you can legislate a period time is very tricky. But if you have the bonded security situation in hand you've mitigated your risks. As long as you've got the bonding right it really doesn't matter what else happens.

*bonds* (new policy already in place but evolving) what will happen instead of financial assurance an estimated rehabilitation calculation, so our department will calculate that so we will go it's 25 million or whether its 100 million we then send a notice to our friends in Treasury and then they decide through an evaluation as to whether the company has to go into the full fund or whether it only gives a bank guarantee, an irrevocable bank guarantee. they then request for that money to be provided, even if it's the full fund they need to provide a percentage of the money, if it's a bank guarantee then advise whether it's a bank guarantee. So, the decision on where the sit in the scheme of things whether it's the fund or a bank guarantee scenario sits with someone outside of our office. If they're not paying or they're not doing what they are meant to have done, so they don't provide the bond, we then do the enforcement. So then they (Treasury) will then advise us... we then have various actions we can take around financial assurances either in non-compliance with and environmental authority because the environmental authority will generally say you have to pay financial assurance, it might be that we suspend your environmental authority so we could send a notice of a proposed action saying you haven't paid us we're going to suspend your environmental authority we might issue and order it depends - but that's how it's going to work.

* *bonds* I think it'll work. There's always challenges making sure you have the right IT, making sure nothing falls between cracks, I think it will be better than what we have now because the moment what we do now is we set the FA for resource projects so we set the FA we send the notice out and advise other Departments, the Department of Nature Resources, we then set a reminder in our calendar to ring up NRM to see if it's been lodged because people have to lodge currently you have to lodge it with NRM not with us so we have to check in and NRM haven't got an automatic checking system so at the moment it's all done manually and what I understand in terms of what we're building is an interface with Treasury so that will all be more automated now so the comparison between what we hold and what we need to hold is going to be done a lot more thoroughly I think.

* *bonds* So we chase everything up that we know, at the moment we chase everything up like do we hold the FA and we have the problem at the moment that lots of people like to give us cash as opposed to bank guarantees particularly smaller companies the problem with that is that it's not necessarily secure particularly if they go into liquidation because other creditors might have a claim on that cash we don't have a process for if people want to lodge cash we have a whole process like some legal agreement to say that no one else can access that cash. Those people that stuff up cash are generally the smaller companies and their likely to go into the full fund.

I just think there is a big risk around people lodging sites in C&M in a sense I think there's an issue around, s generally speaking as I said people go into C&M because of finances generally speaking, you might see one or two go into C&M to drive up the metal price right, but that's generally from the bigger corporations so the issue around the cost they incur while in C&M is often quite high the environmental risk is still there, that is always the difficulty, but I think some better framework around how, and a more official framework like for C&M and understanding that the risk around C&M is different to a risk that is around a mine that is fully operational so you could be a little more agile around how you manage them if you had a more official system around like if you go into C&M this is what happens if you go into C&M this is what happens and you know. We could potentially, particularly in relation to mining lease costs, they could probably be reduced. But yeah, I think it would be better if it was more explicitly dealt with. If it's not, we just treat them like a normal mine.

"One of the things we want to do is to upgrade the amount of resource we're asking of resource companies to reflect 100% of their calculated liability and we've got a financial assurance calculator which our environmental department is updating at the moment."

We're working with financial consultants at the moment to basically do a corporate capability and risk assessment... that will be applied to all companies and out of that they will be given a risk category from low risk to high risk... depending what categorisation your put into the amount of financial assurance and how you pay financial assurance for you rehab costs is going to be calculated. The idea of the rehab costs, the mine gets close out according to a progressive rehab and closure plan

Part of the innovation we're looking at is to get companies to become more active with progressive rehabilitation. That does two things - one it should decrease the footprint of companies down to minimum size at any particular time and therefore minimise the risks if it fails and the amount of work that may be required and secondly it makes companies think more carefully about what closure means to them and the timelines for closure and therefore provision better for it
So then if a company goes into C&M basically what we’ll do is we’ll review the risk of that company and they may actually have to pay a financial assurance in a different category we’ll also chase them to still continue their progressive rehab. So, you can’t just sit around and do absolutely nothing. We’ll also only allow them a certain period of time before we start asking questions about well are you going to use this resource or if you’re not going to use the resource in the future why not get it off it so that it gets available for others. And that also stops a slow decline where a company does nothing on a site, minimises the staff and the resources and things like environmental protection systems slowly degrade. No one’s there much to worry about it, there’s no funds provisioned by the company should anything be required and then one day they look at each other and say ‘heck why are we actually here let’s get out as fast as we can and try to disclaim’. Or at the very best sell the company off to somebody else. But generally, if it’s in a slow state of decline then that may make it less attractive for anyone else.

here’s not much we can do at the moment legislatively to encourage them to do anything but we’re looking at changes so that we can push them to do something or to get off the tenure… So that’s a major change, and then the other change to review the risk of the company and also to review a change in risk if there is a change of holder, so if a company gets bought out by another company. There’s all sorts of corporate takeovers and changes that at the moment we don’t need to be notified about and that can end up in scenarios where you’ve got a smaller company with a tenure that use to be held by a major company.

“There is a valid argument for C&M in the short term. The thing we’re trying to promote is that needs to be reassessed periodically.”

There has been a change in public expectation of environmental and other management of mine sites. So, if you look back 20-30 years there is probably less of a concern with mines sitting in care and maintenance and not doing much. Whereas now a day’s people are more aware of potential environmental risks on the site, the fact sites might not be being maintained being degraded. From a Government point of view, we’re more interested in making sure they comply with all the regulations. Over time environmental, safety and health regulation have all ramped up for sites.

We’ve employed consultants to review what happens both in other jurisdictions in Australia and across the world and we’d argue that what we’re doing is best practice at the moment and we’re leading the pack in terms of minimizing risks and maximising the benefits of resources to Queenslander.

There’s been a lot of work done to check we’re going the best way possible.

We want to allow resource companies to explore and innovate but at the same time you want them to deliver once they start projects. You’ve got to allow a bit of flexibility in there but at the same time you have to manage the risks.

The corporations law applies across all businesses so trying to make special circumstances for resource operations is very very tricky within that context of it being across all corporations, it might blow back… and be undesirable…. so, there’s a hell of a lot of inertia to try to get change at that broader level. There are a couple of other Australian jurisdictions who are concerned about ‘disclaiming’, Western Australia in particular has raised it at cross jurisdictional forums. It is a very very hard one to get traction on. It is easier in a way if you can find a framework to operate and deal with it in a local system than go to the federal one.”

We’ll make changes then that empower us to assess companies and basically set that as part of the ground rules for operating in Queensland. As long as it doesn’t contradict any broader corporations’ law at a federal level there’s no issue.

It’s more about the government having good strategies to make sure that when companies go into care and maintenance its requirements, legislatively, continue and don’t get neglected in the context of the fact that a company is spending less money on a site, has made that conscious decision, and that they’re still very much aware of what their management and maintenance requirements are and what their rehab requirements are.

We’ve met with all the different groups, industry, peak bodies of industry, green groups, government having good strategies to make sure that when companies go into care and maintenance its requirements, legislatively, continue and don’t get neglected in the context of the fact that a company is spending less money on a site, has made that conscious decision, and that they’re still very much aware of what their management and maintenance requirements are and what their rehab requirements are.

I think there would be a benefit in some guidelines, to explain some of the things I’m saying so that everyone’s clear about what would happen. I think most companies probably haven’t thought that much about C&M.

Any guidance I think would benefit from having a bit about that (community consultation).

It depends what you’re trying to achieve (value in having policy for C&M?) so possibly… I’m big on there’s no point having a policy or a guideline unless it’s going to achieve something or do something for me what’s actually important is the regulatory regime appropriate. It can be dealt with under the current regulatory regime but it’s probably something that needs to be investigated as to whether any changes or improvements need to get made to the regulatory regime… we can quite adequately deal with issues operational type issues that still need to get dealt with while sites are in C&M but it’s more the bigger longer term risk is if that site never opens up again and then the long term risk to the state if it never gets closed out and rehabilitated properly. The regulatory regime can still deal with that but it’s an area that is open for investigation whether further intervention needs to be made on some occasions… one of our major goals is to make sure sites close out and rehabilitate in a safe and stable and environmentally stable manner. So if we’re not able to achieve that through our current regulatory mechanisms which is basically the closure plan requirements under the Mining Act and Mining Rehabilitation Fund requirements we do have other financial assurance options under the Mining Act as well in the form of bonds… and just through our regulatory compliance tools that we have as well around directions and things and conditions…. if we’re not able to achieve it; making sure
sites close out in a responsible way through that mechanisms then we have investigated to look at if there are other mechanisms required. It's possible that there are.

810 C&M is definitely a really good thing to probably be studying it's definitely an area that's open to more thought about whether the policy and regulatory framework deals with it well...

810 I find the regulators often is in a balancing act sometimes where everything's got to be done in an environmentally sustainable manner and everything else and it's got to get closed out in an environmentally sustainable manner but sometimes to achieve that end goal once they've already started mining if a sites in C&M you sometimes need to allow a company to come in and give them the time and the ability to start operating to start making money to therefore be able to close it out or deal with any issues they've inherited so it's that kind of balancing act of when is the carrot or the stick approach required for a company to make sure they close out and rehabilitate appropriately or more importantly that they're progressively rehabilitating their site. That's the longer-term issue. The shorter-term issue in terms of if there are significant environmental risks, short term risks for a site in C&M they just get dealt with the same way whether the site is operating or not operating.

811 We are tightening up we are looking at some further guidance and possibly some policy change to tighten up the process of going into C&M... nothing been validated or confirmed there, but it's something we are certainly talking about and considering

811 I think we do very well with the resources we have, like anyone or everyone if we had more resources we could cover more ground WA is a big area and has a lot of mines a lot of historic features and mines and there's a lot of new activity going on, so we're certainly kept busy. As well as the regulator we review and approve proposals we're looking at the approval side of things as well as the regulation of operational aspect as well as the closure component so it's a pretty big to manage, I think we do pretty well with the resources we have.

812 (would more guidance help regulate C&M?) it would be easier to do; it would probably result in better outcomes and there would be more of a push to do it. At the moment, these kind of tasks that come in they're not related to applications we say this is something we should really do, we put it on our spreadsheet that keeps the list of all the jobs, but it's down the bottom, it is literally the last section on the spreadsheet. It's only one that people address when there's... it's reactive to an actual issue a rather than preventative to any potential issue.

812 You've got some companies that have been basically in C&M for the entire length of time that I've been working in the Department. Which I feel is questionable, and I do feel like the Department should have a policy position on I don't think that's reasonable at all. I also wonder how that fits with compliance with tenement expenditure requirements and other things and is that the best outcome for the state having things in really really long-term C&M – I don’t think so. To the extent that you need to keep dewatering pumps running and mills turning over... it's a terrible waste of resources because you're not achieving any end goal to try and just stay in one place, jogging on the spot.

812 Our department would like to have more guidance in place for people but we're not in a position to be able to generate it, if it was done by industry groups or research groups I feel like it's something we could take on quite easily.

4.5 Corporate Responsibility

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<th>Issue of responsibility, management &amp; capacity</th>
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<td>A1</td>
<td>It's really the responsibility of the mid tiers and the tier 1s to raise the bar collectively across industry because it's that's lowest common denominator that performs poorly and that ultimately impacts the reputation of the entire industry. So, if we want to maintain our own license to operate, we really have to look at it from an industry perspective and not just from individual companies. With (NAME OF ORG) part of the reasons for them developing the quality toolkit re-written as we speak, many people around the table in the (NAME OF ORG) say look we don't even use this document because our standards are already there and this thinking is already embedded, but where it is useful is for those smaller companies or emerging countries to get their standards up to scratch.</td>
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<td>A1</td>
<td>It's a fairly obvious one. You know its accountants who run mining companies. So, if they have an opportunity to defer expenditure where there's no asset or income or benefit being derived from doing the activity, they will do that, the NPV forces you in that path every time. One of the things we've done within (NAME OF CORP) we've recently released a new global standard for closure... one of the things we've put in that is that if there is an area that is available for rehabilitation or redundant infrastructure that doesn't feature in the LOA so the Life of Asset plan right up until you completely close, then you must undertake the activity immediately and that's driven a lot of change and behaviour in our company in the last year. Several tailings dams have been sat there and not completely closed, pilot processing plants have been sitting there and so what we've seen in this year's provisions, which is the cost estimate, that all the cash flow for those activities is being brought forward into the five year plan rather than being pushed out for another 60 years. So, it has changed business performance.</td>
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<td>A1</td>
<td>My background is as a mining engineer. I started work on a site in one of my former roles that only had 2 years to run till it was due to close and I could see as a mine planner that short term decisions to save on forward costs were being made even though by spending an extra very incremental amount to haul an extra 200m you could reduce your closure liability. Those opportunities weren't being considered, because all of the focus was on minimising ___ costs, even though this closure costs was just on the horizon. It's that sort of thinking, it's getting mine planners to actually see it as part of their job and a lot of them don't so education is a massive piece. I think in many companies particularly smaller one's closure is still seen as an environmental issue and it's not it's a planning issue.</td>
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| A2   | never actually ask anyone has this thing made money when we calculate from the day it was discovered to the day we closed it, the answer is always no... (laughs) ok - you don't want to do that number "we made money this year" (laughs)
A2 While it's never happened we have often discussed that if we find out that somebody is doing the wrong thing - there is conversations about who is going to go have a chat to the MD or the CEO and just say we're a little bit unhappy - as an industry - with what you're doing. That would never be an official position that is done at a we're professional and we're all very conscious of how that effects everybody else - it takes one bad egg to colour the views of the entire community... generally the government has beaten us to it you know DMIRS they're pretty much red hot onto that sort of stuff these days.

A2 The market these days is also doing itself that these days it's starting to self-select. So if we talk about Endelland and Kimberley diamonds the board of that company, everybody knows what happened there and we take the opportunity to remind investors and other people of just what happened and who they should give money to and who they shouldn’t. Because if we don’t do it who else is going to. In the context of there’s particular individuals who are trying to pop back up, we can't stop them, sadly, we do take the time to talk to people and just go “you might not want to support that.” And very much the government these days goes “we know who you are - your bond is going to be this big (indicates really big) not that sort of thing (indicates much smaller amount).” There's a number of mechanisms in place, coz it is actually quite a small world and through the self-regulation we try to achieve what we can.

A2 When you're operating at that (indicates 5% margin) you can make no good decisions. It's very difficult to make good long-term decisions you're always making short-term; how do you keep her going for another week decisions. You don't get to have conversations like we did yesterday which is ok we're building a new tailings dam next year what have we got to do to make sure that tailings dam is the last tailings dam we build and that when we do have to close it down sometime in the future we've done all the right things. If we're operating here (indicates 5% margin) your sort of like how can we build that thing as cheaply and quickly as possible can and what is the minimum we've got to do.

A2 So, tackling major companies first. You won't find too many major companies that put mines on C&M. Companies that have a larger portfolio of operations can generally weather the circumstances under which you would put a site on C&M. You take someone like Newmont or a large gold mining company they will generally keep operations going because under their cost structure they can. If they do put sites on C&M you would generally find that they are done pretty well. They will have a plan in place, they will maintain infrastructure. they will take control of the site appropriately.

A3 The smaller companies, the tier 3 type companies generally i'd have to say most of their C&M programs are fairly dubious. They will open and shut mines fairly quickly, they are operating at fairly low margins, they have low capital in their business they can't afford to be operating operations at a loss for significant periods of time. You will find that some of them will go in and out of and out of C&M quite a few times at some operations. I've known operations to probably go into C&M 3 or 4 times over the life of the mine itself. There's a lot of talk in the industry the fact that some of these companies, primarily smaller companies, as an excuse not to close. That they will say we're on C&M in fact they have no intention of opening the mine again. Often, they will simply be hanging on to the site until they can divest it. They'll either find a buyer or the market will swing up and they'll divest. Often, you'll find they don't put in place very good programs for C&M. They don't maintain the plant very well; they don't secure it very well. You know in some cases it's been known that they will just simply walk off site. And there have been instances of sites with diesel fuel in the tanks and then pipes will freeze up because they're still containing tailings and all these sorts of things. It doesn't happen as often these days, but it certainly happened in the past.

A3 I think it's just becoming more of a problem to all parties (small companies that don't have the capacity to operate responsibly). I think the industry is suffering - probably it was about 10-12 years ago there was a guy Mitch Hoo who ran the MCA he had a sort of campaign around what he considered to be the laggards in the industry. He was sort of trying to say look the whole industry needs to raise the bar by bringing the laggards with us. He saw that there were a lot of these smaller companies that were the ones that were giving the broader industry the bad name. He was trying to find ways of dragging them up to try and give the industry a better name. (Did it work?) No. Not at this point, no.

A3 The industry wants certainty. They want the certainty of being able to develop, operate and close the mine and move on to the next one, that's what they're looking for. Now they don't do themselves any favours, they're not squeaky clean by any stretch of the means. You've really got this difficult situation where the companies are trying to do the minimum amount to get to zero and move on to the point of being approved for the government and the government is trying to protect its position. The reality is that most mining companies they don't do sufficient work around their true risks their geochemical risks their geotechnical risks they're hydrological risks, they don't understand those very well at all. So you know that sort of the liability that actually exists at that point of whether it be C&M or rehabilitation closure or relinquishment can't really be defined with any high level of confidence at the moment. I think that's where we need to get to. I think if companies start to sort of realise that and do that work sufficiently early in the process, they will get themselves into a much better position.

A3 There is certainly some need for some policy and guidance around C&M and it's long overdue. If it simply comes down to how do we define C&M and accept it as a viable phase in an operation and put some requirements around it. Get companies to declare their intent they have a plan, the adjust their operating plans for C&M scenario and that's controlled over a time period. I think we'd go a long way to resolving some of the issues. The reality is they're still resources, we still need them to be resources we don't want to sterilise these sites - unless there's no resource there some of course. It's just got to become a tool in our armoury for mining. The same way that we approach developing mines and the same way that we're moving towards in terms of closing mines.

A4 It's a broad industry there will be undoubtedly there's good performers there's big companies that think it doing reasonably well, a lot of other medium and small companies doing it reasonably well but without a doubt there's out there are companies that perhaps aren't performing like they should and certainly with the values that industry should be operating. C&M shouldn't be used as a pathway to abandonment, mines should not be abandoned that's my absolutely first position, if there are operators out there performing like that then we absolutely agree that there need to be appropriate regulatory safeguards to stop that happening and that means an appropriate amount of bond with government whatever arrangement governments choose to make on that so as a liability isn't left with government but also it's an incentive for companies to close mines properly but also there needs to be appropriate monitoring an rigour of that sort of rule.

B1 The directors of the company, if there's a way they think they can take a risk and if it goes the right way for them they get lots of money out of it and then they can walk away with it that's all well and good, if they can still take that risk still draw from the company a wage for being a director or whatever it might be, you know being a few million dollars a year or whatever and then the company fails and the big boys sell off to the small people and the small people start to run into problems later in life and can't afford to rehab and then we've got legacy sites.

B2 From a company's point of view, you have an asset that theoretically you could sell on but also it's an incentive for companies to close mines properly but also there needs to be appropriate monitoring an rigour of that sort of rule. There is conversations about who is going to go have a chat to the MD or the CEO and just say we're a little bit unhappy - as an industry - with what you're doing. That would never be an official position that is done at a we're professional and we're all very conscious of how that effects everybody else - it takes one bad egg to colour the views of the entire community... generally the government has beaten us to it you know DMIRS they're pretty much red hot onto that sort of stuff these days.

B2 ... there are companies that propose to take other companies and what we have for is that part of any license renewal, transfer or grant we have processes to actually look at whether a company is fit and proper to take on that lease. In terms of change of control that needs a Ministers approval for a change of control of a company as well. We look at those aspects as part of those applications. It's perfect, no, we could always improve. Look at schedule 1B of the Act - which is further provisions relating to authorisations generally and its part 2 clause 4 other matters to be taken into account in considering applications... (see Act for wording...) Section 5 as well... where they're from a foreign company, if they're not a registered company in Australia we require them to be registered in Australia before we approve a transfer or DGR.

B3 It depends on the size of the company, so the medium size companies are far more tied to the volatility in the market but that hasn't changed over time. The only thing I think that has changed in QLD particularly is that people are more readily prepared to discard the mines and give it back to the state so that whole idea of handing things back to the state has only happened in the last 3 years before that we never had a mine that's been given back to the state. The willingness of liquidators to just go well we're just disclosing this property and you can have it is more prevalent now than it was 5 years ago, so that's been an interesting development for us... We would prefer people to sell a property.

B4 I think industry, it's true to say that industry haven't done a lot of rehabilitation right so we're opening more ground that we're closing, particularly with coal mines and I think for industry what's happened has been brought on by themselves. I think where industry is struggling around the conditions of the legislation that require that a) rehabilitation to be conducted in a timely fashion...
We can't stop anyone from applying for a tenement as far as obtaining a tenement as wanting to lodge proposal, if they meet the requirements as far as lodging all the necessary documentation and it's all considered to be acceptable we can't stop them from getting through.

B11

There's probably not very good due diligence and assessment processes in the you know that sort of mid 90's real gold boom that we had, where there were some companies that specialised in building things really cheaply really quickly and none of those being good long term proposals or opportunities without a lot of ongoing expenditure and a lot of ongoing problems that have just been deferred by not going through proposer closure process because it's going to be really hard. There's a cluster, there's a cohort of mining operations out there, predominantly gold but there's a few other base metals in there and coal, where meeting the closure obligations is going to be so close to impossible that they're never going to do it. They'll be long gone; they'll be out of the state long before they go anywhere close to meeting their closure obligations.

B12

There is a little bit of different focus from industry side. And then the community side there is a little bit of a different focus again. A community is looking at what benefits it might gain out of a resource operation close to it, it might also look at what the downside is to that, in terms of environmental or other impacts. We'll make changes then that empower us to assess companies and basically set that as part of the ground rules for operating in Queensland. As long as it doesn't contradict any broader corporations' law at a federal level there's no issue.
A1 My background is as a mining engineer. I started work on a site in one of my former roles that only had 2 years to run till it was due to close and I could see as a mine planner that short term decisions to save on forward costs were being made even though by spending an extra very incremental amount to haul an extra 200m you could reduce your closure liability. Those opportunities weren’t being considered, because all of the focus was on minimising ___ costs, even though this closure costs was just on the horizon. It’s that sort of thinking. It’s getting mine planners to actually see it as part of their job and a lot of them don’t so education is a massive piece. I think in many companies particularly smaller one’s closure is still seen as an environmental issue and it’s not it’s a planning issue.

A1 … Smaller companies can do this as well. So rather than focusing on its hectares of rehabilitation where you’ve planted trees etc. a better one and where most of the cost is getting the landforms right. If you can plan on that rather than being focused on the green aspect of it which is what most of the regulators people do to that’s where you save the money. So, building a smarter waste dump makes sense for everyone.

A1 That’s it, it’s lazy generally. Closure environmental aspects aren’t part of mining engineer curriculum at many Australian universities where it does exist it’s an elective at best so the mining engineers, we produce aren’t being made aware of the importance of this. So, it’s driven by individuals not by a standard sort of skill set of a mining engineer but they are the right people to be doing it.

A1 Environment is the ultimate benefit, but the people will make the difference who will make it happen or not is the mine planners. Most of your cost is associated with earthworks it’s not the actual revegetation. (summary does not quote = slope gradient requirements for waste dumps and costs associated - series of lifts cheaper than getting a single slope at the correct angle.)

A1 Because the regulations won’t let you do that right (use the land for something other than mining to reclaim mining later), because the mines are set up based on the Mining Act and the Mining regs they don’t talk to other use. To do that, to enable alternate use, even albeit temporary, would require different regulators to get involved and the regulators aren’t mature enough to have that conversations between themselves.

A1 Everyone goes righto in the end of this mine life the total cost to close this thing will be $20 million and the majority of that cost is in rehabilitating the tailings, not so much pulling down the plant - but over here we’ll have a waste dump but we want to make sure the waste dump is like this (draws a waste dump with better angles) to the best of our ability half way through the operation we will have as much of the stuff rehabbed or set back into like this term closure plan as we can. We do that everywhere we can. There’s two imperatives A, the social consciousness and B. the government makes us estimate every single year what our closure costs will is and that is an incredibly confronting number - everybody goes “wow” - those documents are very thick these days and they’re very comprehensive and they’re broken down into infinite detail so we’re all able to look at it and go “ok which ones can we deal with now and which ones can we slot into the overall operations while we’ve got everyone here what can we do. And that’s what we do to mitigate those costs these days.

A2 Everyone is all about what have we got to do to make sure A. we minimise the damage that we do and B. that we leave it in a situation that we can be proud of ourselves when we walk away…. In the past the answer to that has been we’ll worry about that when we need to worry about it. That’s why government has always had the environmental bonds where you’ve estimated your closure costs and rehabilitation costs and you’ve had to put that money on deposit. If closure is to occur the money is there in the bank and that money is there to do that. That didn’t help you if a company went into administration and was gone. Hence why we brought out the MRF where each year we estimate the value of our closure cost and we have to contribute 10% of that on an annualised basis into the combined fund. That fund is administered government and that it’s already reached a level where it is such that- and I’m making this number up - but there’s an extraordinary amount of money in there such that if 5 or 6 of 20% of the state’s mine are to be shut down there’s enough money in there to cover the full cost of closure of those things and then the full cost of their ongoing maintenance and monitoring and stuff into perpetuity.

A2 There is very few professionals or people who go to work these days who want to see an environmental liability left as their legacy. You should see the thumping of the tables that occur in a board room when people find out trees have been cleared these days. This MRF - that’s going to be a great asset in the long run to deal with some of those challenges that all of us just don’t know the answer to.

A2 Even dealing with things that happened 50 or 60 years ago because some of those things are bloody confronting. Some of them we don’t know how to solve them, and these are sort of the AMD issues, closure issues, TSF and waste dumps. There is an enormous amount of research work going on into how do we deal with these things… thankfully in most cases there’s been a line in the sand drawn in that its sort of the case that if you pick this stuff up it’s your problem you’ve got to take it on. Everybody is always very understanding that no you don’t need to fix that up. The government works very hard to ensure that you fix that up. We’ve just spent the past 2 months closing all the drill holes in a particular area that were drilled 15 to 20 years ago. That gives me the shits that that didn’t happen, these are drill holes out in the middle of the bush all the little animals they wandering along, the water gets down there, they can smell the water they go after it - gone. You think about it, an open hole that’s been there for 15 years it must be masoleum don that hole right. We’ve just gone through and closed all of those, it’s taken us 2 months, there’s been five people down there for 2 months every single day for 12 hours a day, that’s how much it’s taken time wise, but we did it, because we’ve taken on this that’s the job.

A2 I guess it’s a discussion that emerging within the mine closure space at the moment around what is a closed mine. So, there is a number of gold mine that effectively rehabilitated the disturbed areas, but they are still a mine - the site hasn’t been relinquished. If you talk to the companies, they’re in C&M even though in some cases they’ve demolished the plant, completely demolished the plant they’ve rehabilitated the site to the requirement, but they don’t seek relinquishment. And basically they consider that to be in C&M and a sort of passive C&M if you like because there is still reserve there, there is still ore in the ground and they figure that at some point in time they will either be able to divest the site at a reasonable cost or they will be able to re-open and re-capitalise and operate the site again. (WA) we still have bonds but it’s just discretionary now, whereas before it was mandatory it’s now discretionary. Because of our MRF and they are effectively putting in 1 to 2 % of their supposed rehabilitation cost - the Department doesn’t quite have the comeback. The way that it works the MRF builds up some money but whether or not, what money they can spend on a site the site actually has to become abandoned first.
Again you've got to look at the term closed… so a mine that has been closed to me is one where they've ceased production they have removed the infrastructure they have rehabiliated the site to some conditions and they are in this post closure phase and [and if I was in Canada I would say care and maintenance]. That's a closed site, now yes there are some good examples of sites that have been closed. A lot of gold operation around the mid-west and goldfields region have been closed but they are still on a mining lease - they've not been relinquished and that's the difference. There's been no attempt to relinquish the site. That's an interesting point because companies don't actually have to declare their intention to relinquish or to just maintain a site in post closure. I know that the government is actually looking at relinquishment guidelines at the moment, so this is DMIRS, and we're all eagerly anticipating what they're going to come out with. Because it's quite likely that they will come out with some guidance around this particular issue as to when a site closes and goes in to rehabilitation that there does need to be some sort of declaration of intent around the site and potentially even the development of a new type of lease that could be a relinquishment lease or something … rather than having a mine lease that the company can say right I'm moving to relinquishment I want to set up a relinquishment lease and then I'll declare my intent to basically demonstrate that I've met my obligations and get out of the operation.

Which will be interesting because there is a view within some companies that and some of the larger companies that don't want to see that done because they're concerned that if they close a site and move towards relinquishment then what is stopping another mining company coming in claiming over the top of that area and then re-opening the mine and then making a mess, basically recreating the liability that the company has just absolutely … if a company rehabilitates a tailings dam effectively relinquished back to the state, under our crown land system there's nothing stopping another company coming in and pegging over the top of that tailings dam and saying ok I'm now going to mine that tailings dam. Now a company like Rio sees that as a risk to them, because they will then still be seen as being responsible for that tailings dam. There's some real emerging issues around that sort of whole closure / relinquishment piece. So yes, there are some good examples of sites that have been rehabilitated, put into closure and rehabilitated, mostly small gold sites, very few large mines would be in that category, because there are so few that have closed. There are no large operations that have been relinquished in Australia. Certainly there are areas of land that have been rehabilitated and signed off by government but I would see those as being fairly low impact areas, there's been some in Queensland and some here in WA but nowhere where there's significant pits, and tailings dam and those sort of things.

Lots… oh look absolutely you've only got to look at some of the legacy sites the governments are dealing with Rum Jungle, Mt Morgan in Queensland, Brukunga in South Australia… WA is lucky in that it's probably the only state that doesn't have a large legacy mine. Certainly, Queensland and SA have their share, I believe there's a couple in NSW, … where they haven't been closed properly the issues are perpetual, particularly around some of the latent risks around acid and metalliferous drainage those sorts of things. Lots of bad examples and to a certain extent that's why we've got this inherent fear within government about the liabilities that they could inherit. To a large extent they're in fear of the risk but they're also avoiding the issue. They're fear is that if they get in and start to actually dictate policy and standards around some of this stuff, not only will you create a sovereign risk but if they get it wrong they're created a way for companies to get out. If they come in and put in a standard that down the track proves to be incorrect or inappropriate, then they will end up in the situation anyway. Which is why we often find that they will put it back to the company and say well 'you tell us what you're going to do and how you're going to do it and then we'll decide whether or not we're going to accept it' part of the big issue that we have is that the government has never accepted what the companies have come back with. These days they have bonds which are applied… they’ll (Dep't mines) apply bonds to ensure they have adequate money to rehabilitate a site when a mine closes down. To deal with old historic areas where you might not have that bond there, it’s still more beneficial to have someone there mining the operation and getting them to manage the pollution from the site rather than having no one there and you've still got to deal with the pollution but you don't have anyone there to manage it... sometimes it gets to be a bit of a line, do you say ok well let's do this provided you manage these other areas. So I suppose it an become a bit of a balancing act in a couple of situations where the mine itself might be the only source of income for the community or you have historic workings or a historic mine site which is still being mined but you've got this huge legacy, so how do you manage that legacies do you try and get some benefit out of managing those old site by allowing the current operator a bit of leniency, for want of a better word, but still staying within the legislation.

We sometimes walk a tricky line I suppose where a facility might be the primary employer for the community but yet if it closed down and sold and the company went into receivership for instance, your still left, or the government is still left with dealing with the site and maintaining the site.

I think that’s something that is misread by a lot of people. In NSW like I said they still have the obligation to rehabilitate, just because they go into C&M doesn't mean that they don't have to rehabilitate. They're schedule may obviously change because as mining progresses then the rate of rehabilitation increases…

That's were a security bond process comes into it to make sure we've got sufficient security that in the event that that does occur that we have got funds to be able to undertake the rehabilitation. We consider that as an end of pipeline solution… As part of our regulatory oversight over that sight we'd
The point is that if you’re not in C&M or you’re not operating then the expectation is that you will be actively working to close down and rehab. And bear in mind as I said at the beginning the first important point is making sure we’re holding the right security, so if the worst comes to the worst the government can step in and complete cleaning up that site.

That’s been said. Well here it could be, however in this jurisdiction I come back to the fact we require a 100% security upfront. In Queensland I think the bonding system is different. Now, if I’m holding a couple of hundred million dollars against you cleaning up the site, pretending to look after the site for ten years is not doing yourself a favour. You are better off saying "look we’re not going to do anything we will clean up the site" and then we’ll (the Mines Dep’t) give you the bond back.

In Queensland if you’re not fully bonded then you could just string out the C&M and then possibly eventually go into liquidation and hand the liability for clean-up back to government. Which is why I like the 100% security upfront. I’m not sure that is a universal requirement across Australia.

Yes, for a period of time (post closure monitoring), usually not very long. If you go to the (NAME OF MINE) closure plan, which was published in June, they’ve actually allowed for 25 years of post-closure monitoring which is unusually long, most companies sort of say 5 years and we’re out of here. It’s a tricky one if you’re a regulator - I’ve had this some years ago - what is a reasonable period of time. I think it was sort of a situation where a company though 3 years was more than enough the traditional owners thought 20 -25 years would be a minimum and regulators were looking at 10 years or around about 10 years. The argument was never really resolved because the site changed hands and there’s still activity on the site so monitoring is still going on even though the site has now being cleaned up people acquired the site and continued to explore - that’s around Narbalek - so there’s still a presence and there’s still activity, albeit not quite what was envisaged at the time of the original discussion in 89'/ 90.

The other example, that I don’t see here, but is used in some jurisdiction in the US, they will take unencumbered real estate at their valuation. So if you’ve got an apartment block that you own they will hold the deeds, the office of surface mining, they will hold the deeds for that property but they tell you what it’s worth, so the mining company says this is a 1 million dollar apartment block and department says no it’s $520,000. Or the other thing they will take in the States is they will hold government bonds. So, they will accept bearer securities which means again that any interest accruing, accrues to the company.

In our system here because we hold the cash as the deposit there is no interest for anybody, which upsets a lot of foreign investors particularly the Chinese, well they say look your holding 2 million or 20 million dollars there’s interest to be made why don’t we get it, well the answer is nobody gets it, which I must admit I think is pretty dumb but that’s the law.

In Queensland if you’re not fully bonded then you could just string out the C&M and then possibly eventually go into liquidation and hand the liability for clean-up back to government. Which is why I like the 100% security upfront. I’m not sure that is a universal requirement across Australia.

Well as I say WA had a system and then the previous government kowtowed to the whims of industry, I spoke to a colleague of mine in WA at the time and I said it sounds like a rogue’s charter to me.

My personal opinion, long held, is cash is king, hold the money and re-assess reasonably frequently, annually perhaps for some operations, it can take you a long time to work out. ERA...announced that they had previously told the world that their rehab costs was $520 million and now they’re saying it’s $790 million. They’re being very transparent which makes a pleasant change.

Which is why most companies prefer the system I spelled out where you give Commonwealth Bank 2 million dollars and they issue you a guarantee for 2 million dollars, you pay fees, but you do get interest.

With the big mineral mines it’s a bit hard to close down areas because there’s generally only one pit and one or two waste rock dumps they’re often till the end of the mine life still working on those pieces of infrastructure which are the highest risk pieces of infrastructure to close out particularly the waste rock dump and the tailings storage facility. I think the scope, in coal is a lot and aluminium for that matter and sand mining, to actually do progressive rehabilitation is a lot higher than in the mineral sites that I generally deal with.

Look we do make sure we hold the financial assurance that we’re meant to. So, we would have set a calculated financial assurance if their operational. So in a first check we’d also make sure we hold a financial assurance we have to in the form, preferably, in a bank guarantee which is irrevocable, if we don’t we’d instigate some level of notices of proposed action to either suspend or variate to get the assay out of them or an order if we need to get the financial assurance so we do look at the financial risk as well. Generally speaking, we speak to our colleagues at NRM as well because if people struggle, they will struggle with these rates everything. So, we will generally know that they’re on the radar we have 2 weekly meeting with the people in NRM to actually work through the highest risk mines and what we’re doing with them. so yeah, we do look at those components as well.
The industry is struggling to deal with having to have post mine land uses for all aspects of their operations. So, most of the voids that are left, particularly in mineral mines, won’t sustain a post mine land use because it will be a pit with pretty bad water quality in it. Allowing that in the new legislation there is a public interest test around that. I think that’s where the pain point is for industry. I think they agree they need to do more rehabilitation it’s just always cheaper not to do rehabilitation because Net Present Value will dictate that anything you do in the future is better than doing it now right. It’s a business decision not to

We believe that our financial assurance scheme and the discount system that we used to have would promote rehabilitation - it clearly didn’t. We have fought particularly for our mines we’ve upped the financial assurance quite substantially with everybody because they don’t do trials on waste rock dumps on tailings so we always put a conservative cap on it because it’s expensive - so that’s driving some trials to be done. I think industry fought pretty hard against this new Bill (reference Nov 2018 Bill) ... I think it’s primarily around timing of when do you go into rehab, voids and residual voids and them not having a land use they’re the issues that are really problematic.

The bonds are reviewed and adjusted every, at the moment, at a minimum every five years. Every time you change your environmental authority when people come in and amend their environmental authority, you have to, at the moment, (something) operations, in the future it will trigger a new ELC(?) calculation

We can review bonds at any stage, the first check we do when a company goes into C&M is do we hold the FA that we think we should hold, is the amount of disturbance still the same as what we calculated the bond on there’s always a few checks you have to do first up. Then if we think the outcome of that sort of audit type scenario is that we have more disturbance than what we thought they had then we re-calculate the bond but if disturbance on the site is commensurate to what we calculated the FA against we’ll keep the FA as it is;

Possibly some of those companies have paid a bond in the 70’s and they’ve finished on their site 30 years later ... if their bond hasn’t been reviewed in that period of time it might be good for them, they might just use it and say we’re walking away from that site. Very few of them are likely to do that most of them have been reviewed at some point, changed, adjusted...

Now most of our mining tenements and extractives mines and quarries have a bond like other states... the bond protects the taxpayer and the state if they have to step in and do the rehabilitation themselves. Now these bonds and increasingly being called for 100% or even 110% of the liability of that so we have a bond calculator which we use to independently or internally assess what we see the costs would be for us, not necessarily the miner, so for the government to come in is probably a little bit more expensive than the miner would do, and meet the rehabilitation obligations as specified in the PEPR or in the environmental operations plan is under, at any time. We’re aware that the miner can go bankrupt or pull out at any time and the bond is basically for the protection of the taxpayer and we have called on a bond from time to time.

With legacy sites and abandoned site Mineral Resources Tasmania, Department of State Growth, are the lead agency that look after that. MRT are the body that administers the bonds or the financial assurances on the site, we obviously work with them on setting those bonds. In the past they’ve deemed to not be adequate so their going through the motions at the moment to review existing ones and increasing them if need be so we that do have adequate coverage should sites be abandoned and become a legacy for the state. We certainly have a significant number of legacy sites that are dealt with through the Mining Rehabilitation Fund Committee. Obviously, that’s only X amount of money...
There’s two parts - there’s C&M and the other one I think you could parallel quite well is rehabilitation. Many companies when they go into rehabilitation don’t start rehabilitation straight away, they may need to develop a detailed rehabilitation plan and in that situation it’s like being in C&M for a few years while that’s underway.

The interesting thing for me is making sure the state adequately monitors all of that and is able to quantify what the risk is to the state where at some point in time the state has to step in and say we don’t think there’s a going concern here anymore and the site needs to be rehabilitated.

Yeah, I mean if you had to go in and rehabilitate every single mine site in WA, that’s more money that’s in the fund, there’s no doubt about it. I wouldn’t deny that, but the really big risk is the likelihood of that happening and the land come in and we might only have to manage for a certain amount of time. This is what happened when the (NAME OF MINE) site became abandoned and we basically went through an EOI (expression of interest) process, we’re still going through that at the moment, if someone decides to come over and take over that site then they may well, depending on how it all works out but they may well, if they’re going to re-mine areas, inherit some of the liability to rehabilitate some of those areas so the government doesn’t have to spend the ‘fund’ on that. I don’t think it’s a high likelihood that a site will fall over, and the government will immediately have to spend hundreds of millions of dollars on it.

The one risk factor is the bond and the rehabilitation and making sure there’s going to be sufficient resources to make sure the government doesn’t have to spend money on rehabilitation, and you do that early in the piece with C&M.

We’ve been increasing our bonds in recent years ... some of them have definitely been to low... I think if you’ve got a strong bonds system in place there’s not the same incentive for companies to misuse C&M or pretend that they’re not really closing down. There’s a requirement for the regulator to be active on that... we’ll tolerate C&M for 2 years but after that it’s like uh uh start rehabilitating or give it to some else.

Whoever is owning the tenement at the time ... all of the obligations keep occurring while the sites in C&M so for example they need to keep paying into the Mining Rehabilitation Fund so there’s no exemptions if you’re in C&M you need to keep paying your rent on your tenements you need to keep complying with all your approvals and tenement conditions ... whoever is taking over the site just inherits that and if there’s any bonds on the tenement they would have to place the same bond with our Department with our Minister, and the other one would get withdrawn. There’s no real hindrance from it (getting out of C&M) unless they need an approval from us in which case we just need to go through that process.

* (*corporate risk*) Imagine there’s a big mine and they’ve been mining all these areas and maybe they started rehabilitating a little bit and maybe there’s still a lot of rehabilitation that needed to be done and they suddenly went into C&M and they sold it to another company that company coming in might be, and this is a cycle that we do see sometimes, sometimes it might be a smaller company with less resources who might buy because they see an opportunity - doesn’t always happen that way sometimes is happens the other way round and a bigger company takes over - all this mining’s been done over here but they’re actually saying we’re going to keep chasing gold in this area and the might not actually end up having the wherewithal all to actually rehabilitate everything and take over all those liabilities but the other company is already gone. It’s on the companies to do their appropriate due diligence to make sure they can actually undertake all the rehabilitation that remains and all the closure that remains on the site. If we’re seeing sins there’s a risk there’s when we need to step in to make sure their closure planning is up to date make sure they’ve got some good time frames on when they’re going to rehabilitate things that we can hold them to it ... if any of those things are flagging risk to us that’s when we look at, are there additional financial assurances required for this site.

There’s other options and usually if a site becomes abandoned we will go in there, we’ve got an abandoned mines team, we’ll go in there and just deal with immediately what needs to get dealt with we won’t necessarily go in there straight away and say right we’re going to rehabilitate the whole site within 6 months because it might not be in the states interest, there could still be a resource there we don’t want to sterilise a resource that society can get a benefit out of in terms of royalties and jobs.
| B10 | Majority of times when a site becomes abandoned there’s still a resource there. That’s in a most common scenario when a company basically goes into receivership and if the reason, they’ve gone into receivership is more around the way the company has managed itself not so much that they’ve just run out of resource. If there’s no resource left, that’s when you definitely haven’t got much of an option left but to rehabilitate the site. Generally speaking, we know what resources are left in the mine sites in WA because they provide geologically reporting to us they provide production reporting to us to royalties, we know what reserve was there when they got approved. Generally speaking, we’ve got information about the amount of commodity that’s still there so if we’ve got a site that’s coming right towards the end of its expected life of mine that’s when we’ll be monitoring it potentially closer. |
| B11 | There is also the need to report against the MRF disturbance categories on an annual basis for each tenement as well... the greater the disturbance footprint the greater the value of the MRF payment that’s required. In the past we used the unconditional performance bond process through that process we would deem a site going into C&M if it was high risk to be a high risk so then we would just elevate the bonds to suit. The difficulty with sites going into C&M from a financial point of view then it could be quite difficult to get resources at that time, the easiest way to get the bonds is at the approval stage because if you don’t lodge the bonds you don’t get the approvals. The capacity to impose bonds is still there, so we still have the ability to impose bonds, the process and procedure to do that is more complicated now but that still exists. But as I said if we’re then trying to apply bonds at a time when the company is in dire straits it’s going to be a difficult process. Our bond requirements is that their unconditionally guarantee by an appropriate and approved financial institution so you’ll find it difficult to get banks to provide bonds to the Minister for a company that might not be financially strong, so it’s a difficult time to do it, to be asking for a bond. The most effective time is upfront. The MRF process is I guess is just a contribution on an annual basis based on the disturbance footprint and the nature of the disturbance and it’s been deemed at this time that its 15% of the closure costs it’s going to take some time to build up the fund. We had well over a billion dollars in IPB. But the performance bonds also had a value because if a bond was enforced it would provide a negative impact to the company from a financial borrowing perspective, so if they had a bond enforce for environmental reasons a lot of financial institutions would identify that as being a high risk and they would a lot of things to protect that bond. There’s an example where we’ve had a company spend in the order of $2 million dollars to recover $20,000 so they were quite a powerful, even just purely from a reputational and financial perspective so they do work well, we still have them, they’re still available... they can be applied anytime but the process is... there’s a few more people involved in the process now there needs to be agreement - (see website). |
| B11 | (what’s the plan for those problem sites?) Our department has a role but it does mainly sit with DMIRS through the abandoned mine program and the mining rehabilitation fund. Which needs to build up to full strength still. Contaminated Sites has a role through the contaminated sites act. Mine closure should be complementary to contaminates site processes. The mine closure actions should ensure contaminated sites actions have been completed as part of the broader closure. When you don’t then it’s a big thing that the MRF is prioritised for risk where there’s other funds that can be used for that remediation, or fixing up the issues, then it drops down the priorities list for contaminated sites and the contaminated sites issues are also very focused on human health impacts the focus is beyond groundwater where people live or use the groundwater or where there is surface contamination close to a population of people, so a lot of mines wouldn’t get priority through contaminated sites funding processes. |
| B12 | What was found is that the value of what we had held in bonds if there was a significant default wasn’t enough to clean up what was on the ground... it was quite a very effective tool and there was one person in the department who ran that whole bond process. We would set them as part of our assessments and reviews so when we’d do an annual review if we deemed the bonds needed adjusting then we’d adjust them but it was managed by one person so the onus was on the companies to manage it all. I guess with this other one, the MRF the onus is on us the Department to make sure people are paying it, where as in the past if you didn’t lodge your bond you didn’t get your approval, there was an incentive. If you want to start mining you had to lodge the bond. There were certain projects where they couldn’t get funding from financial institutions so the projects didn’t proceed. As with the MRF there is no upfront hurdle they can start as long as their paying their annual calculated contribution and there is that obligation there to pay and meet all the other requirement and they can continue to mine. |
Ongoing issues with members of the public accessing this site, I was the registered manager over one long weekend, one Easter weekend about 10 years ago and we had there were 12 four wheel drives 2 water ski boats a couple of jet skis, quad bikes dirt bikes and over 20 people on the pit. That was a huge wake up call for us we’d always seen it before but never really caught people in there, so there was always evidence of camp fires, shotgun shells, liquor four wheel drive tracks that sort of thing so we knew people were using it, so I deliberately went out on a long weekend to try and, well if people are going to be there that’s they’re going to be there and the scale of it blew my mind. So post that we went through a huge exercise of reinforcing all of our security measures so things like improving the fencing, improving the signage, putting padlocks on the gate building bunds across tracks that were no longer needed rehabilitating some tracks that were no longer needed and yet every time we went through that exercise people were still finding a way in. So we had to go to a next level, because we still needed to access the site to take water samples, we had to go to the extreme of - we basically built a gate where we go the design from an international embassy and installed that. That lasted for three months until someone went out with a gas axe and actually chopped the gate up. That was because we put the gate in because we still needed to access it. So when we came to is well, we’re just going to have to make it so we can’t access it either. So, as a result we don’t take the water samples anymore. So when we do the water samples now, which is much less frequent that we use to, we have to take a piece of earth from moving equipment out of the pit with us to open it up, so a huge cost, but it’s worked now it’s kept people out. Now that was about 18 months ago - so what’s happened - they’ve move on to the next pit and that’s where the fatefully happened.

Let me give you an example. (NAME OF CORP) we don’t have any current operations in Canada we have (NAME OF PROPOSAL) which is a future in the development stage we have a portfolio of 15 mines that are currently not operating in the US and Canada now all of those are either in; pre closure - so their closed, they don’t intend starting again so they’re very much not C&M but their pre closure, all of the execution work hasn’t happened yet; or their in post closure monitoring and maintenance and these post closure monitoring and maintenance ones are ones that it’s a long term liability that we haven’t been able to fix - poor water quality is an example so we have to run water treatment plants in the long term - they’re monitoring and maintenance or active closure is another term used.

An example I can give you is one of the ICMN companies had a gold mine in Africa and basically it shut down temporarily because it was an uneconomic situation what happened was the local community who came in because the mine was there so there was employment - they were all out of a job. The mine shut down but what happened is the mine started artisanal mining. And unfortunately, about 20 people, this is within the last 18 months, died because they were artisanal mining and they were using explosives and they blew themselves up. I can’t tell you the company, the other interesting thing is you can do a search on it and you won’t find a thing on the internet because the price of life is cheap in some countries. If it was (NAME OF ICMN) we would have been crucified for it. This isn’t a junior it’s a mid-cap. It’s not a huge the media aren’t interested in it. That global angle I think between developed nations and developing nations is a very interesting one when it comes to C&M.

Look the mine has been going on since the 1890’s. It was mainly gold; it was a boom time site. The population was around 4,000 people. It’s been sporadically operating since, on and off, on and off. The modern operations really commenced in the 60’s and 70’s. It more or less brought the prices of the ore and shares market as to whether it stops. Primarily it needs both those resources to have a reasonable price per tonne to make it worthwhile to develop. It’s a very hard rock, the ore, it’s a difficult site that in the area of a country georgeução. The underground mine workings – historically they’ve gone down below sea level. It operated throughout the 70’s and 80’s. It went into receivership... in around about the 2000’s. It was picked up by another company ... in about 2004 they spent about 50 million dollars upgrading their processing facilities, then found out the processing facilities they installed didn’t quite work. They then sold it in about 2013 and 2015. In December 2015 it went into a care and maintenance mode and it’s been offered for sale and has been sitting there dormant since then. When XYZ had it, it went into C&M in about 2011 or 2012, they had it for a few years and in C&M mode for a few years. That’s probably, primarily, where we ran into problems with it in around 2011 and 2012. there were challenges presented with the mine in C&M mode, obviously mining wasn’t occurring there was still a significant amount of storm water management and wastewater and tailings which still obviously had to be managed on site.

Given that the site is a historic site in the way that operations commenced back in the 1890’s you have the legacy mining that they have to deal with... Back in the 1800’s environmental concern wasn’t high on the agenda. A lot of the processing for the mine and the gold leaching was undertaken at the bottom of the gorge in cyanide leaching tanks... Of course, being at the bottom of the gorge every time they had a severe rain event these dams filled with cyanide and toxic waste and everything use to just wash down the river. ***they identified 194 old workings... water running through old workings and hard rock so at point of discharge contaminated with arsenic and antimony just running in to the creek. *** If no one was running that mine that system would not be happy we’d just have that water discharging uncontrolled and unmonitored into the river!****

We’ve got one coal mine in the Hunter Valley that has been in C&M for I’d say over ten years. At the moment that particular mine is being bought by another company. Now they’re looking at doing some further underground mining but in a different area... it really comes down to the value of the resource.

I’ve seen a plant where I think the company genuinely believed in one to two years’ time, they might have been able to restart it, became obvious that the situation and market were not going to change to their advantage they fairly quickly went to a minimum. **They realized the value of the resource and share market as to whether it operates.**

The company said well our risks have reduced significantly because we’re longer having conveyors running through the coal and that was one of things that use to start the fires ... and we’re also not having as many vehicles driving through the coal that could start a fire and we’re also not doing as much hot work that could start a fire... we said ok we accept all of those point but there’s another risk... these are external fires so a bush fire in the area can go into the mine... so we said yes we agree with you there’s a lot fewer fire risks on site that your causing yourself but there’s this external one which is the main one it is still in play so you need to have enough people on site to deal with that under the different weather conditions. The hotter and windier it is the more people you need to have. So, we actually put a requirement on them in just the past few weeks for this coming season, because they reduced their staff right down to as few as four people over an area of 7km square. We said look that’s not enough to do what needs to be done so we gave them directions to increase that.

We’ve got this situation at the moment with the (NAME OF MINE) iron ore mine, that’s public knowledge that that’s in receivership at the moment, so we monitor that... because even while it’s in receivership and receiver manager is appointed and their still essentially obliged to do everything their meant to do so we make sure they do all the monitoring and meet all the conditions they’re meant to meet. But we obviously monitor it to see hang on is this going to get sold is someone going to be able to take this over and are they going to be able to take over the obligations and if not that’s when we need to intervene.
If they're done well, and there are some companies doing some really good work... I inspected a site not so long ago and it's been on C&M for a number of years but the company the ay that their managing the site is very refreshing to see. A lot of these may not be as managed as well as they should be or could be... I guess in many cases it comes down to the personnel that are involved that are representing the company. They were very very good it was impressive to see everything was neat and tidy cleaned up and they've got a team of three people that are managing this site I think the cycle a bit so at times there will be three on site and other times there might only be two on site, but they will always have at least two for safety perspective its their duty of care if someone gets injured or hurt that there's another person there to help them out. It was very very impressive, probably one of the better ones I've seen. Then there is other examples where the site is pretty much - doesn't have any representation on it and someone might visit it once a year and you can see that is the case - just from a weed management perspective, from a degradation of roads and infrastructure, bits blowing off buildings, metal coming off structures.

Where something comes to my attention and I have concerns about it there are some flags about environmental risks, DMIRS will be one of our first stops. We will check out with each other what approvals we've got for a particular site do they match up, has that company done something with DMIRS but not us, or vice versa... We do share a lot of information and when we're dealing with something in care and maintenance and the risk of abandonment, we almost always have a working group with them and other areas of government to make sure we're all responding in the same way. We're doing that at the moment with a site where there is quite high risk of abandonment because of the situation, they're in C&M and the parent company is in receivership. There is a lot of money being spent on this mine during the period of C&M, by receivers to just maintain things in an operating way. The cost of that is in the vicinity of $1 million a month... when it's been in that state for over 2 years, it's not generating any money it's a big drain on someone's finances. It's in the government's best interest to see that site sold to another operator who is going to resume operations and then go through the closure process properly rather than just abandon and just disclaim it back to the state. The remediation of that particular site... would properly cost more than the entire fund holds at the moment. Would we do that, would we actually do what needs to be done, and the answer would be no we wouldn't do the full proper closure and rehab we would just do the minimum to make things not critical.
Appendix 5 Interview Data Analysis (second phase) Review by Topic

5.1 C&M Mines / Operating Mines

**5.1 DIRECT - MINES IN C&M ARE STILL TREATED AS THOUGH THEY ARE OPERATING MINES**

NA - (all industry)

A4 
Also, companies through the C&M period need to meet all their environmental conditions that continues to apply right through that period. Environmental monitoring is likely to continue, land management is likely to continue for example fire and weed management, certainly management of safety need to continue...

81 We still hold the same requirements (whether operating or in C&M) those licenses are available on the website....

82 they (C&M mines) are still bound by the title conditions under a mining lease and the current condition of a mining lease at the moment is requiring that they must operate a site in accordance with an approved Mining Operations Plan (MOP) from the Department....

in terms of environmental management, the power of the act is unimpaired whether the mine is in C&M or operating. The point is that if you're not in C&M or you're not operating then the expectation is that you will be actively working to close down and rehab. And bear in mind as I said at the beginning the first important point is making sure we're holding the right security, so if the worst comes to the worst the government can step in and complete cleaning up that site. Other legislation, I mean in terms of a workplace it's still a workplace so therefore the workplace health and safety regulations still apply. The tenement is still a mineral lease, there are a number of conditions that have to be fulfilled in terms of reporting they still apply. Just because they're not making any more obligations don't necessarily go away at all.

83 "It's more about the government having good strategies to make sure that when companies go into care and maintenance its requirements, legislatively, continue and don't get neglected in the context of the fact that a company is spending less money on a site, has made that conscious decision, and that they're still very much aware of what their management and maintenance requirements are and what their rehab requirements are."

84 NA (envi dep't)

NA (envi dep't)

87 When a miner goes into C&M, they're still obliged to meet conditions under their PEPL... often they will notify us when they go into C&M or we'll often know in advance.

88 [prompted with a question - mines in C&M still have to follow other laws] That's right so aside from, and/or unless otherwise specified under the conditions, they have to meet these water quality objectives and policies as with any other activity in the state.

There is no specific C&M policy. it largely comes down to the work plan. So, the guidance or the policies are used in setting the work plan and because we take the conservative approach that you keep managing as though it's an operating site. That makes us in a pretty robust position - it puts the onus on the company to ask for the change rather than us telling the company what things they need to do when then go into C&M... they have to keep operating it as though it's an operating site, apart from the staffing, which is the area we look most closely at, all the obligations are there. So, they know they've still got the obligations it's just about how many people you need to fulfill those obligations and how well trained they need to be. ... An example would be monitoring, if they're required to monitor on a monthly or quarterly or whatever frequency basis, that monitoring requirement continues whether they're in care and maintenance or not.

89 Really the regulatory regime doesn't actually change. Whilst the lease is there, they're still required to meet all the obligations regardless of what stage of mining they're at really. So, the obligations stay the same what more probably changes is the extent to which we might have to monitor the situation because the risks have changed.

810 Requirements to still meet all of their reporting obligations and any other obligations, they may seek exemptions from particular things like stack monitoring if emissions aren't occurring, or pressure testing if vessels aren't operating.

811 NA (envi dep't)

**C&M or MC PLANS**

We then require a C&M plan. Which would set out all different aspects, now primarily we're concerned about environmental protection. The Act requires that there is a document called the Mine Management Plan which is updated annually or as required. If you go into C&M, then your MMP is the C&M plan. To maintain the authorisation there has to be an MMP. There was talk of revising the MMP template to include a C&M template but it's difficult because, as I said earlier on, each site is unique. Having a template is difficult, having a template for C&M is even more difficult - exploration seems to be fairly straightforward.

83 Day to day really, it's just ensuring that the activities comply with their MMP plan so if there's timeframes that are committed to within the C&M plan. As in regular monitoring and that sort of stuff that's where we would go and out inspect those sites periodically to ensure that they're not causing any environmental hazard or environmental nuisance while they're under C&M. That's our general day to day just ensuring compliance with that plan and carrying out inspections.... As the regulator of the activities, operational or otherwise, we would then require the company to generally submit a C&M plan that obviously comes through and gets approved if appropriate and then we regulate the C&M through that plan.... Generally, its (a pseudo C&M plan) required via our conditions under the land use permit or an environmental protection notice if it's been issued on the site to vary the conditions of the permit. Generally there is a condition in there for temporary suspension of the activity and under that condition the director of the EPA can require a C&M plan if notification is given of suspension of operation.... (is it applied evenly across all sites in C&M) No. Some sites that have been on C&M, smaller ones, have generally been regulated under just under their current permit or environmental conditions so they continue to do the monitoring if required, covered by the conditions. It's the more complex sites that a larger C&M plan may be required, particularly if there's not going to be any personnel on site. Some of the larger mines have at least kept people on site during the C&M period.

810 The Mine Closure Plan Guidelines talk about having to demonstrate what you would do in the event of C&M or temporary cessation of mining. Sometimes there's some regulatory requirements there as well that we make sure the companies are meeting.

810 I'm not aware of a specific policy that's specific to C&M only what does apply to it mainly is the Mine Proposal Guidelines and the Mine Closure Plan Guidelines and their both statutory guidelines. So, when a proponent wants to mine in an area, they need to lodge a mining proposal and it's a statutory requirement and their mining proposal deals with things during C&M as does their Mine Closure Plan.

**MINE PLANS**

The mines department issue a mining operation the company has to submit a 'mining operations plan' which has to be approved by the mines department. They also oversee part of that, they issue them a license as well within that. It could be the council, or it could be the planning NSW they will have issued a development consent approval, now a development consent approval will have a number of conditions and so they've got to adhere to those as well.

82 We can direct them to issue a MOP for closure. Transfer them from a C&M phase into a closure phase... We can direct them to issue a MOP for closure. Transfer them from a C&M phase into a closure phase.
At the moment, these kind of tasks that come in they're not busy. As well as the regulator we review and approve proposals we're looking at the approval side of thing they have available to make sure they do it properly and then set out inspection frequency accordingly.

The government have been a lot more proactive on sites in C&M you meet your environmental criteria but you don't sit on them indefinitely, you don't want site where the mining company kind of forgets about it and doesn't really meet its environmental obligations, you want to let you know pretty quickly if it looks like it's going to go south and possibly going into receivership. I suppose the main reason that the department becomes aware of C&M is because they'll make an application to us to make th

It's just really that you probably need to define what C&M is because people often want to come to us to reduce their environmental monitoring requirements etc. and that is a little bit difficult for us to administer because once you've amended the AIM in QLD your environmental authority is there forever so then you need to go ok while you're in C&M you don't need to do XY and Z but as soon as your out of C&M you have to and that is not an easy process in the sense that because the definition of C&M isn't clear it's not that simple

So, if it comes to C&M, the work plan explains how they will operate, it can include some detail on how they will maintain the site whether they are operating or not. The simple answer is that when a company goes into C&M, we check the work plan to make sure that the measure that need to be in place remain in place although they're in C&M.... Their requirement is to have a license to access that part of the land. To actually do mining they need something called a work plan which is effectively an operational plan that explains where they will dig, how they will dig and includes how they will remediate. The other thing they need to start mining is a bond which is a financial assurance / bank guarantee that means that if they go into liquidation or are unable to pay for the remediation themselves we can draw on that bond, as government, to do the remediation.... Because the work plans are quite detailed - the guidance and the policies are used to define the work plan in the first instance at the point of approving or assessing them once they're in place we don't so much look to the guideline as look to the work plan itself which are case by case specific..... There is no specific C&M policy... it largely comes down to the work plan. So, the guidance or the policies are used in setting the work plan and we because we take the conservative approach that you keep managing as though it's an operating site. That makes us in a pretty robust position - it puts the onus on the company to ask for the change rather than us telling the company what things they need to do when then go into C&M.

MONITORING - seeking a reduction

Perhaps some of those issues the intensity of work on some of those other matters whether it be environmental monitoring and others might decrease. For example, if their monitoring air emissions and there's no operations they can start winding that back. They certainly need to keep the core of their environmental conditions met

It's just that really you probably need to define what C&M is because people often want to come to us to reduce their environmental monitoring requirements etc. and that is a little bit difficult for us to administer because once you've amended the AIM in QLD your environmental authority is there forever so then you need to go ok while you're in C&M you don't need to do XY and Z but as soon as your out of C&M you have to and that is not an easy process in the sense that because the definition of C&M isn't clear it's not that simple

However if they want to come back and say for example they want to do monitoring once every year rather than quarterly or they want to increase their levels of contamination that can go into a watercourse or something like that, that's when you recall a PEPR. Often you'll recall a PEPR or revise a PEPR when there's a mark change to the mining plan, as in you've got a new feature of the mine a new waste rock dump, a new tailings dam ... often when a site goes into C&M or comes out of C&M that's when you'll call a new PEPR... you don't have to change the PEPR because you go into C&M often when they come back and want to change the way they mine or the environmental impacts of mining that's when you do call a new PEPR.

An example would be monitoring, if they're required to monitor on a monthly or quarterly or whatever frequency basis, that monitoring requirement continues whether they're in care and maintenance or not. They would have to actually contact us to say well we're no-longer doing this activity that needs monitoring so we can please drop that monitoring down - but the default would be that the monitoring continues. And in most cases, we would leave it in place if it was things like water quality monitoring or dust monitoring.... it's a case by case - what are the key risks what is the monitoring that needs to occur can we let it drop or not. Again, the starting point for us is - keep doing it like you're doing it. The onus is on you the company to explain why we would drop anything (monitoring) off

Requirements to still meet all of their reporting obligations and any other obligations, they may seek exemptions from particular things like stack monitoring if emissions aren't occurring, or pressure testing if vessels aren't operating

That's one of the other reasons that the department becomes aware of C&M because they'll make an application to us to make the monitoring frequency reduced because it's quite expensive. We would generally, again we've got an understanding among the people who work in this area all the time, that the appropriate response to that application is x y and z, sometimes we say yes and we say no depending on the setting and what it actually is that they're requested. Again the number of times that that comes to us versus the number other applications that we deal with, that's not written into any guideline or procedure or any form of guidance externally or internally for how to assess, that relies on people making a judgement on the circumstances.

Lack of Consistency in compliance monitoring - or highlighting the need to keep a focus on C&M sites - undertone the risk is that it drops off the radar

It's (C&M) certainly a warning to say look ok we have to keep an eye on this facility, don't let things lapse, as in you know don't like to find an annual return or sampling, water sampling hasn't been done... you need to maintain that rapport with staff on site, they'll let you know pretty quickly if it looks like it's going to go south and possibly going into receivership. I suppose the main thing is that when it does go into C&M mode you do keep a bit of a watching brief on it to make sure it is still actively being maintained.

If they've made an application which you've just allowed to go ahead without any consultation etc. you don't do a good job as regulators to make sure they keep it up and running. So you don't want to have a situation where the mining company kind of forgets about it and doesn't really meet its environmental obligations, the government kind of forgets about it and the community kind of says well what's happening with these sites. Both the community and the government have been a lot more proactive on sites in C&M you meet your environmental criteria but you don't sit on them indefinitely, you either progressively rehabilitate and close or you look to re-open re-min e again.

So, I think the toolkit is not too bad. It really is more, to me as a regulator, to have active management of it, make sure there's enough bond in place, make sure we go out, if we find out someone is in C&M go out there early understand their staffing understand the resources they have available to make sure they do it properly and then set out inspection frequency accordingly.

I think we do very well with the resources we have, like anyone and everyone if we had more resources we could cover more ground WA is a big area and has a lot of mines a lot of historic features and mines and there's a lot of new activity going on, so we're certainly kept busy. As well as the regulator we review and approve proposal's we're looking at the approval side of things as well as the regulation of operational aspect as well as the closure component so it's a pretty big _______ to manage, I think we do pretty well with the resources we have.

At the moment, these kind of tasks that come in they're not related to applications we say this is something we should really do, we put it on our spreadsheet that keeps the list of all the jobs, but it's down the bottom, it is literally the last section on the spreadsheet. It's only one out of hundreds of tasks that people do on a daily basis. So we're certainly keen to move on the next line of our list.
5.2 Sterilising Resources / Resource Value / Exploration

Int. STERILISATION

Again, as resources continue to be mined, lower grades are going to become more and more attractive once the high grades are gone, so therefore something that is currently uneconomic could be economic in the future. The importance of that one is that you're not doing anything in the short term that could sterilize that resource in the future. I think there is a huge opportunity that comes from that which is about temporary use of the land.

A1 So, you know the governments in a strange situation where they've got a dual role where one is to protect the environment but the other one is to have that ongoing economic benefit. So yes, you want to protect the environment, but you don't want to sterilize the resource that's there for the nation.

A3 There's certainly some need for some policy and guidance around C&M and it's long overdue. If it simply comes down to how do we define C&M and accept it as a viable phase in an operation and put some requirements around it. Get companies to declare their intent they have a plan, the adjust their operating plans for C&M scenario and that's controlled over a time period. I think we'd go a long way to resolving some of the issues. The reality is they're still resources, we still need them to be resources we don't want to sterilize these sites - unless there's no resource there of course. It's just got to become a tool in our armoury for mining. The same way that we approach developing mines and the same way that we're moving towards in terms of closing mines.

A4 Quite importantly we want to make sure we don't sterilize resources unnecessarily by being too tight on that or having some unrealistic expectation on timeframes for which operations commence. I don't think that necessarily a good place to go I think it's very much needs to be for courses based on the type of commodity and trying to understand the cycles associated with the commodity and other things. I think you will find that government also wouldn't be that keen on seeing resources or future resources potentially sterilised.

A4 Certainly, we'd encourage the right safeguards to be in place to ensure that mines are closed properly, on C&M there needs to be flexibility around that, and we need to avoid sterilising resources unnecessarily I think that's really important.

RESOURCE - VALUE / FUTURE MINEGROUN/ CLOSING / EXPLORATION

It really only comes down to the value of the resource. Some mines have just got a really mineable resource then there is less and less potential for it to go into C&M. But those others that are just marginal ... for example the coal price has just gone up that will give more people an appetite to get in there and actually mine those out.

B2 We'll also only see a certain amount of time before we start asking questions about well are you going to use this resource or if you're not going to use the resource in the future why not get off it so that it gets available for others

B3 There's various ways a mine can go into C&M the most common one is the resource has become uneconomical or extracted - so there's obviously finite limits for a lot of these mines We've find probably more recently the mine goes into C&M because the resource or the commodity price has dipped to a point where it's no longer economic rather than the resource being exhausted and that said even when they think the resource is all exhausted you often get secondary or even tertiary mines coming in taking over that tenement and the environmental obligations that they operate under and try to extract a little bit more of the resource out whether it's out of the tailings or the waste rock dump or even re-mining the pit itself to try and get a bit of resource out at a lower cost.

B5 The exploration side of things is really handled by MRT so they're the ones who obviously the goal there is to maximise resources and recovery I'm not sure how actively they actually push for it but if you're approving an activity to mine in any given area you want to ensure that they can maximise recovery out of that further exploration is obviously encouraged to a point taking into consideration the sensitivities of the environment that you're working in

B6 We put the onus on the company if they've been in C&M for a time, why should we believe that you're in C&M the onus is on you to show us that there is any resource left or there's a good prospect of a resource rather than us

B7 Majority of times when a site becomes abandoned there's still a resource there. That's in a common scenario when a company basically goes into receivership and if the reason, they've gone into receivership is more around the way the company has managed itself not so much that they've just run out of resource. If there's no resource left, there's that's when you definitely haven't got much of an option left but to rehabilitate the site. Generally speaking, we know what resources are left in the mine sites in WA because they provide geologically reporting to us, they produce production reporting to us to royalties, we know what reserve was there when they got approved. Generally speaking, we've got information about the amount of commodity that's still there so if we've got a site that's coming right towards the end of its expected life of mine that's when we'll be monitoring it potentially closer.

B8 One thing I haven't mentioned is the way we do a whole compliance regime and how we are monitoring sites from an environmental and closure perspective in this department is all, we've got a risk-based system. So as part of our risk matrix and how we rank sites we think about things like, what's the status of the mine - are they in C&M; how far away from expected planned closure are they - because if they're getting towards the end and they're exhausting all the mining that's really able to be done there they're basically exhausting the resource and if they become abandoned at that point in time and not completing their closure that's when it's really high risk for us in terms of closure. Their closure planning needs to be in a final state they need to have demonstrated that they've really commenced rehabilitation works and we monitor really closely to make sure it actually close it out and rehabilitate it. So that's the riskier end if they fall away at that point in time and there's no resource left who's going to want to buy that, some one's got to rehabilitate it. We haven't had too many of those in recent times, where we've had to step in

B9 There's always big spikes and booms and dips. Everyone you know suddenly goes off to work in nickel mines because nickel is having a big boom and everyone puts their deposits and are looking for work elsewhere... the same happened with iron ore, though far fewer of those went in to care and maintenance because they tend to be longer term projects. The same with gold, there's a regular pattern over a couple of years a steady flow of the smaller sites going into C&M as they run out of resources because they haven't done any exploration and then there will be something that comes up that gives more people an economic incentive to go underground and they really start to get back in and come back into producing. At some sites it might mean a big cut back, the pits cut back to a safer angle and any problematic material mined out and removed so it will then allow for safe operation at the depth of the pit. The costs of doing that is significant and then economies come into play about how much resource is there and it is economic to cut that pit back to a point taking into consideration the remaining ore, they're the decision that are informed through geological models, market conditions. There's a whole heap of drivers that would control how that occur. They Department and he Government don't really have a hand in that ... it's the

B10 In the world of the deeper cuts they tend to be just left as a pit void we accept that it will be a pit void and it's not going to be of any benefit in the future but it needs to be left in a safe condition with an appropriately established abandonment bond around that pit. They can sit like that for many years, decades and then someone can come back in the future and they might recommence mining. some of these might have underground developments at the bottom of the pits... things like seismicity can be a game changer when it comes to long term mining, it may be that's not safe at that point in time to go back in, but... and different mining going elsewhere may be the ability to go back in and recommence mining. At some sites it might mean a big cut back, the pits cut back to a safer angle and any problematic material mined out and removed so it will then allow for safe operation at the depth of the pit. The costs of doing that is significant and then economies come into play about how much resource is there and it is economic to cut that pit back to a point taking into consideration the remaining ore, they're the decision that are informed through geological models, market conditions. There's a whole heap of drivers that would control how that occur. They Department and he Government don't really have a hand in that ... it's the

B11 (see under commodity price - companies haven't done exploration.... And run out of resource ...) They just process and extract the value out of what they know is there, without doing any expenditure to extend the life of that mine... If they get the new structure and staff who are prepared to develop a regional exploration program and are prepared to spend money on it on a bigger scale... it tends to be companies that get set up there's a big expenditure on all the new infrastructure and then they just operate and they don't spend too much money on exploration and then it comes to the end of that 7 to ten year mine life, and they go into care and maintenance. Which doesn't mean there's no resource out there, they just haven't had that in their plan it's been a ten-year plan for what-ever reason. Then a different company will come in and acquire it because it's cheaper it's in C&M and go from there

B12 and they don't spend too much money on exploration and then it comes to the end of that 7 to ten-year mine life and they go into care and maintenance.
The same with gold, there’s a regular pattern over a couple of years a steady flow of the smaller sites going into C&M as they run out of resources because they haven’t done any exploration and then there’ll be something that changes in the global commodity cycle or economic situation and there’ll be some merger and acquisition between gold mining companies or a new one will move into Australia and they’ll acquire a lot of the smaller ones and there’ll be an injection of cash and possibly a consolidation of processing capacity in a certain area, and people will go ok we’re going to upgrade the mill at this site which means we can bring this mine, this mine and this mine out of C&M and away we go again.

It all comes back to this little puppy here (the left-over one) the minute that (commodity price) moves past that (operating cost) you go hey guys let’s start up again. There’s that massive dynamic and most shareholders or owners of the company, we’re all intrinsic optimists, if that resource is there, if everybody is confident on the future upside of it, everyone goes you let’s just keep it on C&M we’ll fund it on C&M because who know what happens in a year or two time the price will change we all believe that we’ll get going again. Or if the owners and the shareholders have the view that look we’re going to go up high enough for us to justify restarting it we don’t want to own this anymore - you then go through a sale process again you don’t go through closure. There’s always going to be somebody out there who is going to value that.

We all would rather do that and put it into a set of hands who are going to look after it and somehow create value in the future, than tear it all down to destroy that value. In the big picture that’s the thinking and the thought process that drives companies when they’re running operations and then making those decisions of do, we go into C&M or closure. Everyone would rather than avoid closure like the avoid - like you’d prefer to go to hospital - you would do everything you can to not go there.

So our company is having that conversation what are we doing to avoid solve at some point in time well we’ve been exploring aggressively to expand the life of the known asset and we’re starting to look into these other areas and look at these other known assets or resources to see how can they could be brought into the business model of the operation that’s the majority of what we do.

### OTHER EXPLORATION MENTIONS

- It could be grade control so with the geologists the basically do their in pit exploration or mine exploration and they are predicting what the ore grade and content will be, sometime they get it wrong, so if they start to dig into what they think is high or certain grade ore and it turns out to be much lower that again effects the economics, they might stop and put it onto C&M to do some additional drilling to prove up their resource.
- It is interesting there are two ways that junior companies operate. So often you’ll find that junior companies will be exploration focused and they will be the ones that go out and find the resource and then they will stake the resource, then they will sell the resource to a company. Often, you’ll find though, I don’t know if it’s greed or whatever it is, these companies will start to see themselves as operators, and they will then try to operate the sites. And I think that’s where the problem comes in because then you get these small operators who are really not set up to operate a site. That might be an avenue as well for the government to look at how they manage how they approve a site going into operation and who is operating it.
- Another one I know they suspended operations to do a lot more exploration and they will probably restart, and the others - well your guess is as good as mine as to what their real intention is.
- Having a template is difficult, having a template for C&M is even more difficult - exploration seems to be fairly straightforward.
- We still had a level of exploration, it’s just that with exploration there’s nothing established they just sort of sit on them for about 8 months - 2 years until things get a little more economical for them and then those mines that we do have a large number of them still continue to operate they just downsized work forces and didn’t produce as much as they would in the past and then there were a couple that did go into care and maintenance because that part of the business wasn’t economic at that point in time, but they’re just starting to pick up again so in the next couple of years we’ll probably see no mines in C&M mode.
- A few of them do (exploration during C&M) a couple of them actually start to get all their paperwork in order...
- ...historical gold mining town and there’s been gold mines on and off there since the gold rush era 150 years ago. There is an active mine there and it did go into C&M a couple of years ago and it’s just coming out of C&M again following some further exploration.
- I can’t do this economically I don’t quite have the finances to do the next bit of exploration needed you’ve got two choices - either raise funds or someone else who’s got money buys into it. The difficulty of raising funds when you’ve just turned the site off it’s a bit hard to convince investors.... I think the model is much more that a company will take over, that’s got a bit deeper pockets or is a bit happier to take the risks and see what happens.

### 5.3 Company Size

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<thead>
<tr>
<th>Int.</th>
<th>Info on company size</th>
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<tr>
<td>A1</td>
<td>I mentioned earlier about where you are on the cost curve the lower margin mines are being put into C&amp;M because you want to maximise your supply chain usage. If you’ve got optionality to put higher margin material into one mine than you will do that, that makes sense. So there’s that planned element that I think that only fits with the majors so you are seeing more of that I think from a planned perspective, but the issue of the smaller operators with a single mine or just one or two mines that’s always been a big issue. Gold mines it happens all the time.</td>
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<td>A2</td>
<td>The other one is when you look at more of a large business perspective so it’s not single mines it’s where they’ve got a portfolio there could be a situation where either gain because of commodity prices but again the individual costs of running a site things can move around in the portfolio. So you may have a league of operations and as certain sites may drop into the higher end of operating costs and the value and everything that if you’ve got capacity in another mine you would logically close down your lower margin operation to value add to the higher margin operation.</td>
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<td>A3</td>
<td>My view is that the default, most mines that are said they’re in C&amp;M are actually closed or abandoned. That’s the thing, that’s that default. If they (small companies) go into C&amp;M it’s unlikely their ever going to start again unless they default they go bankrupt, the government will pick it up from an abandoned perspective or another company will come in and try to operate it again</td>
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<td>A4</td>
<td>It’s really the responsibility of the mid tiers and the tier 1s to raise the bar collectively across industry because its that’s lowest common denominator that performs poorly and that ultimately impacts the reputation of the entire industry. So, if we want to maintain our own license to operate, we really have to look at it from an industry perspective and not just from individual companies. With (NAME OF ORG) part of the reasons for them developing the quality toolkit re-written as we speak, many people around the table in the (NAME OF ORG) say look we don’t even use this document because our standards are already there and this thinking is already embedded, but where it is useful is for those smaller companies or emerging countries to get their standards up to scratch</td>
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<td>A5</td>
<td>An obvious one is divestment, so if a company still holds on to it, they could divest it to a junior who may have different operating overheads - so what uneconomic to a major could be economic to a junior</td>
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<td>A6</td>
<td>I think it’s just becoming more of a problem to all parties (small companies that don’t have the capacity to operate responsibly). I think the industry is suffering - probably it was about 10 -12 years ago there was a guy Mitch Hook who ran the MCA he had a sort of campaign around what he considered to be the laggards in the industry. He was sort of trying to say look the whole industry needs to raise the bar by bringing the laggards with us. He saw that there were a lot of these smaller companies that were the ones that were giving the broader industry the bad name. He was trying to find ways of dragging them up to try and give the industry a better name. (Did it work?) No. Not at this point, no.</td>
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The smaller companies, the tier 3 type companies generally I'd have to say most of their C&M programs are fairly dubious. They will open and shut mines fairly quickly, they are operating at fairly low margins, they have low capital in their business they can't afford to be operating operations at a loss for significant periods of time. You will find that some of them will go in and out of C&M quite a few times at some operations. I've known operations to probably go into C&M 3 or 4 times over the life of the mine itself. There's a lot of talk in the industry the fact that some of these companies, primarily smaller companies, as an excuse not to close. That they will say they're on C&M in fact they have no intention of opening the mine again. Often, they simply will be hanging on to the site until they can divest it. They'll either find a buyer or the market will swing up and they'll divest. Often, you'll find they don't put in place very good programs for C&M. They don't maintain the plant very well; they don't secure it very well. You know in some cases it's been known that they will just simply walk off site. And there have been instances of sites with diesel fuel in the tanks and then pipes will freeze up because they're still containing tailings and all these sorts of things. It doesn't happen as often these days, but it certainly happened in the past.

So, tackling major companies first. You won't find too many major companies that put mines on C&M. Companies that have a large portfolio of operations can generally weather the circumstances under which you would put a site on C&M. You take someone like Newmont or a large gold mining company they will generally keep operations going because under their cost structure they can. If they do put sites on C&M you will generally find that they are done pretty well. They will have a plan in place, they will maintain infrastructure, they will take control of the site appropriately.

There are some sites that have been on C&M for a long period of time. E.g. Cause Nickle, Bulong that went onto C&M 3 or 4 times that was a nickel latente. Not sure if it's currently going at the moment. Magellan lead. A lot of them go C&M and come out again, but it does seem to vary on site. The smaller companies certainly when they do it is more likely to happen.

It's interesting there are two ways that junior companies operate. So often you'll find that junior companies will be explored for focus and they will be the ones that go out and find the resource and then they will steel the resource, then they will sell the resource to a company. Often, you'll find though, I don't know if it's greed or whatever it is, these companies will start to see themselves as operators, and they will then try to operate the sites. And I think that's where the problem comes in where then you get these small operators who are really not set up as well for the government to how they manage/ how they approve a site going into operation and who is operating it.

Then if you get into one of the very large metalliferous mines the sort of the iron ores, those sorts of things - don't know if I've ever seen an iron ore mine go into C&M they will like channel line deposits you will mine it out once it's gone its gone. The larger mines they tend to sort of keep going and when they shut, they shut. It sort of varies between the commodities.

It's a broad industry there will be undoubtedly there's good performers there's big companies I think doing it reasonably well, a lot of other mid and small companies doing it reasonably well but without a doubt there's out there are companies that perhaps aren't performing like they should and certainly with the values that industry should be operating. C&M shouldn't be used as a pathway to abandonment, mines should not be abandoned that's my absolute first position, if there are operators out there performing like that then we absolutely agree that there need to be appropriate regulatory safeguards to stop that happening and that means an appropriate amount of bond with government arrangement governments choose to make on that so as a liability isn't left with government but also it's an incentive for companies to close mines properly but also there needs to be appropriate monitoring an rigour around the regulation of those activities as well to avoid that happening.

From a company's point of view, you have an asset that theoretically you could sell on - that and there hangs another problem. So that Rio Tinto, Glencore, BHP have a site they put it in C&M and then they sell it, and you know a second or third tier mining companies picks it up for a very cheap price with the hope that they can restart the operation. This is where holding the security is so important because if I'm holding 200 million for your site and you decide to sell it to abc mining they have to replace that security before we'll let them take on the job; that's one for smaller companies. But you look at other jurisdictions and you see a mine gets to two thirds of its mine life and the big boys sell off to the small people and the small people start to run into problems later in life and can't afford to rehab and then we've got legacy sites.

industry in [JURISDICTION] is organised like so Glencore holds a heap of mines but none of them are actually Glencore owned as such they are all owned by different companies that hold sister companies or daughter companies of Glencore. So Mt Isa mines is one of our biggest is Mt Isa Mines Proprietary Limited but it is a Glencore company and then there's Tenery mine and it's Tenery Pty Ltd so it's easily sold off for them You know they could sell Tenery Pty Ltd and tomorrow there might not be a mine no more. I think that that issue around the real estate in the industry is real and they often go to juniors right at the end of mine life they sell off to a junior, the junior sells off to an even smaller company and in the end, you generally in the end of mine life end up with a company that is not particularly solvent. yeah you know they don't get the grade anymore because it's at the end of mine life and it goes into C&M

an obvious one is divestment, so if a company still holds on to it, they could divest it to a junior who may have different operating overheads - so what uneconomic to a major could be economic to a junior

Volatility in the resource sector and particular the prices and the copper mines the smaller mines are very dependent on the copper price going up and down and they go into C&M a fair bit

There's always a bit of a tight line to people say look we think there's we're going to come out of this and it's only a couple of months you know you can probably work with them to make it happen. As I said the medium size companies are difficult to deal with, they're hand to mouth often their cash flow is an issue, they're not that easy. Like the big companies are easy to deal with because generally money from them... at least there's a parent company you go back to... generally speaking as I said people go into C&M because of finances generally speaking, you might see one or two go into C&M to get up the metal price right, but that's generally from the bigger corporations so the issue around the cost they incur while in C&M is often quite high the environmental risk is still there, that is always the difficulty...

So we chase everything up that we know, at the moment we chase everything up like do we hold the FA and we have the problem at the moment that lots of people like to give us cash as opposed to bank guarantees particularly smaller companies the problem with that is that it's not necessarily secure particularly if they go into liquidation because other creditors might have a claim on that cash so we struggle with that a bit so we have a whole process if people want to lodge cash we have a whole process like some legal agreement to say that no-one else can access that cash. Those people that stuff up cash are generally the smaller companies and their likely to go into the full fund

We're not a fan of people going into C&M full stop because we prefer sites to be operational just because environmentally management, generally speaking, is better while you have people are operational. The only benefit I see of people going into C&M rather than either selling or going into liquidation - it can be on sold over time to a company that might be able to make money out of it. We do see a lot of bigger companies selling their less profitable sites to smaller companies because they have less overheads so we find mines generally will move through the hands of various people particularly towards the end of mine life. The only company I know that's actually put a mine in C&M other than due to financial stress and that was Glencore and that was to drive up certain prices. So, if they need to drive up the lead price, they might put one of their mines into C&M, but they will generally manage that site quite well.

There's not much we can do at the moment legislatively to encourage them to do anything but we're looking at changes so that we can push them to do something or to get off the tenure... So that's a major change, and then the other change to review the risk of the company and also to review a change in risk if there is a change of holder, so if a company gets bought out by another company. There's all sorts of corporate takeovers and changes that at the moment we don't need to be notified about and that can end up in scenarios where you've got a smaller company with a tenure that use to be held by a major company

When a mine goes into C&M they lose 99% of their staff usually, you also lose a lot of plans, programs they all get lost there's not a lot of continuity you can get bought out by a smaller miner and so at that time if someone else buys it out while they're in C&M you have to look at if they have the capability and the capacity not just to do the mining but to do the rehabilitation as well. That's one of the key things when they go into C&M is how does their capacity to do the rehabilitation change and making sure the bond reflects that even if the PEPR, the environmental criteria that they have to meet remains the same

Iron ore was a bit of an example of that with a lot of the marginal iron ore deposits when the iron ore price dropped right down suddenly became unviable but at a $180 a tonne pretty much the whole state was viable. The big companies obviously can sustain those commodity price changes because their business model and the way they're structured and the volume of material they produce is such that they can weather what the smaller juniors can't
5.4 Defaulting

My view is that that’s the default, most mines that are said they’re in C&M are actually closed or abandoned…That’s the thing, that’s that default. If they (small companies) go into C&M it’s unlikely their ever going to start again unless they default they go bankrupt, the government will pick it up from an abandoned perspective or another company will come in and try to operate it again.

The Departments in a very hard sort of position where it if it makes too much noise around this C&M issue then it will end up with a greater number of abandoned sites on its book and at the moment it probably wants site in c&M rather than abandoned. Which is an interesting policy situation.

C&M certainly isn’t abandonment, abandonment is not something we ever want to see in the industry, quite clearly. That means a company has defaulted on its obligations and walked away. Regulations have matured to a point, I think, where that is pretty unlikely. Governments have safeguarded through the bonding mechanism. Abandonment I think is the poorest end point for any mine site, in this day and age we would not want to see that whatsoever. And as I said I think safeguards are in place that happening or at least secured funds to cover any liabilities remaining should government be left with that liability. That doesn’t happen very often I would certainly hope.

Going from c&M might be a precursor to closing the sites and walking away from them but certainly, as I said, we just watch the sites when they go into C&M just ensure there is maintenance and monitoring being undertaken by the company, and that’s all you can do I suppose. They’re not getting any profits in they’re not making any money, they’re still expending money…C&M is a high risk because companies don’t like parting with money when they’re not getting any back in so for their bottom line or for their shareholders it’s probably better just to walk away from it and close it up. So, I suppose it’s a juggling act for them too, so they keep there and try to offer it for sale as a going concern...

In some instances where you’ve got a company that is not feasible and can’t actually take it on themselves, you know ideally we would be hoping to facilitate that another buyer would come on and take it over because that’s going to be a better outcome to effectively rehabilitate it. We don’t really want to get into the space where we have to actually get in and rehabilitate it ourselves. So, if there’s a viable resource there, that’s one of the best ways to get it addressed.

Probably 80% of them get sold, some go back into production, and probably 10% - I’m just guessing here - 10% go ultimately into administration and liquidation. Look they go through the administration processes often the get sold through the administration process... we’ve got three mines that have been abandoned in my area since I’ve been here. Formally abandoned, liquidators basically just dispose of it like an incumbent asset under corporations’ law then the state becomes responsible for them....

C&M could be just a wait it out or it could be a precursor go into receivership and then let into administration then into either windup or claim.

There’s obviously other times where a mine goes bankrupt, administrators take over now that can go into C&M as well, so I’ve got a number of sites that I look after where administrators are responsible for the C&M and that’s a bit more difficult because there’s no real active rehabilitation going on and you are waiting for another buyer to come in and buy out the stranded asset and then meet some of the rehabilitation obligations… That said there are miners that do put into C&M to try and for stall their rehabilitation requirements and it really depends as a regulator ourselves, how long do we give these miners before they actually have to do their rehabilitation. That’s a difficult one for us often we give them a period of time to do the works but you know - dangling I guess the re-opening of the mine or an adjacent mine down the track doesn’t mean they don’t have to meet their rehabilitation requirements. After a couple of years or so of C&M we’ll either be pushing the miner to recommence mining. After a couple of years of C&M it’s very hard to convince investors…I think the model is much more that a company will take over, it’s a bit of a juggling act to, to get the risks and see what happens.

Sometimes it can happen really quickly that a site will be operating and then it will go into receivership basically it hasn’t even had a period of C&M and all of a sudden it stops. So sometimes it can be it can be sudden…. What does happen, as I say there is often some financial reasons as to why they are in C&M, so often what happens is that they stop for a while and get more funding or look for other buyers. What’s much more common in C&M is that sites will change hands people will take over areas try and make a go of it... there’s always a risk that they will go into receivership but often... they will be operating and go into receivership...that’s happened more commonly... then they go into C&M or something else once they do ...

I would say probably where abandonment has occurred it has almost always occurred after a period of C&M, but the incidents of abandonment is quite low compared to the incidents of C&M which then those operations go on to resume operations. It’s there as a factor but I don’t think it’s really a major concern. The instances of successfully restarting operations, there’s a couple of successful cases there over the recent years, one that’s been in the news is the OZ mine over in Kalgoorlie...I’d say probably around 2% of the sites have that potential.

They’re avoiding going into C&M in some cases, and I think that’s not at high risk of imminent abandonment but almost certainly the parent bodies intention is to avoid their closure obligations, because the closure wasn’t costed into the overall model for the mine when it was built. We’ve got good closure guidelines now that say that it should be done progressively as far as possible and that you have to fund it properly. But 15-20 years ago, we didn’t have those no-one forced people to do it even though it was out there as leading practice you weren’t forced to do it, so people didn’t do it.

We do share a lot of information and when we’re dealing with something in care and maintenance and the risk of abandonment, we almost always have a working group with them and other areas of government to make sure we’re all responding in the same way. We’re doing that at the moment with a site where there is quite high risk of abandonment because of the situation, they’re in C&M and the parent company is in receivership. There is a lot of money being spent on this mine during the period of C&M, by receivers to just maintain things in an operating way. The cost of that is in the vicinity of $1 million a month... when it’s been in that state for over 2 years, it’s not generating any money it’s a big drain on someone’s finances. It’s in the government’s best interest to see that site sold to another operator who is going to resume operations and then go through the closure process properly rather than just abandon and just disclaim it back to the state. The remediation of that particular site... would properly cost more than the entire fund holds at the moment. Would we do that, would we actually do what needs to be done, and the answer would be no we wouldn’t do the full proper closure and rehab we would just do the minimum to make things not critical.
### 5.5 Selling

**Int.** Discuss Selling as a way out of C&M

**A1** (pathways for mines to come out of C&M) An obvious one is divestment, so if a company still holds on to it, could divest it to a junior who may have different operating overheads - so what uneconomic to a major could be economic to a junior.

It all comes back to this little puppy here (the left over one) the minute that commodity price moves past that (operating cost) you go hey guys let’s start up again. There’s that massive dynamic and most shareholders or owners of the company, we’re all intrinsic optimists, if that resource is there, if everybody is confident on the future upside of it, everyone goes hey let’s just keep it on C&M we'll fund it on C&M because who knows what happens in a year or two time the price will change we all believe that we’ll get going again. Or if the owners and the shareholders have the view look that we just don’t think that the price is going to go up enough for us to justify restarting it we don’t want to own this anymore - you then go through a sale process again you don’t go through closure. There’s always going to be somebody out there who is going to value that. I mean look at that you’ve built all of that you’ve got all that physical infrastructure there. WA is such a small place these days somebody will buy that off you even if you’re selling it to them for 1 million or 2 million dollars.

We would all rather do that and put it into a set of hands who are going to look after it and somehow create value in the future, than tear it all down to destroy that value. In the big picture that’s the thinking and the thought process that drives companies when they’re running operations and then making those decisions of do we go into C&M or closure. Everyone would rather than avoid closure like the avoid - like you’d prefer to go to hospital - you would do everything you can to not go there.

**A2** If a new owner comes in and purchases that they may well take on the liability of past activities. It’s a bit of give and take, if a mining company comes in they don’t want to start with a headache from someone else’s poor practices, but those practices occurred many many years ago, and obviously what they did back then we wouldn’t allow now.

**A3** It’s a bit like you’re trying to sell your motor car you’re better off maintaining keeping it washed and polished and trying to sell it rather than letting it sit in the yard and letting it fall apart and then trying to sell it.

In some instances where you’ve got a company that is not feasible and can’t actually take it on themselves, you know ideally we would be hoping to facilitate that another buyer would come and take it over because that’s going to be a better outcome to effectively rehabilitate it. We don’t really want to get into the space where we have to actually get in and rehabilitate it ourselves. So, if there’s a viable resource there, that’s one of the best ways to get it addressed.

The only benefit I see of people going into C&M rather than either selling or going into liquidation - it can be on sold over time to a company that might be able to make money out of it. We do see a lot of bigger companies selling their less profitable sites to smaller companies because they have less overheads generally will move through the hands of various people particularly towards the end of mine life.

Probably 80% of them get sold, some go back into production, and probably 10% - I’m just guessing here - 10% go ultimately into administration and liquidation. Look they go through the administration processes often the get sold through the administration process... we’ve got three mines that have been abandoned in my area since I’ve been here. Formally abandoned, liquidators basically just dispose of it like an incumbent asset under corporations’ law then the state becomes responsible for them... The ones that are totally financially unsound will end up being sold or being abandoned.

When they on sell we generally will get the company... come back and say we’re going back into production what do we need to do so most of them once they get sold do go back into production.

If we think the tenement can be extinguished and another miner can peg a claim over the top and re-start mining quicker than the existing miner, we’ve got no interest in trying to encourage land banking and holding on to that. That said it happens a lot less than some people may think.

I think what tends to happen is it tends to sell rather than go in and out of C&M a lot of times.... C&M in a sense says.... I can’t do this economically I don’t quite have the finances to do the next bit of exploration needed you’ve got two choices - either raise funds or someone else who’s got money buys into it. The difficulty of raising funds when you’ve just turned the site off it’s a bit hard to convince investors.... I think the model is much more that a company will take over, that’s got a bit deeper pockets or is a bit happier to take the risks and see what happens.

Once you’re in C&M you’ve got no input coming in you’ve just got costs going out... it’s in your interest to sell it to someone to take the burden off your hands or to get out of it quickly rather than to have more money going out and then go into receivership.

Over 15 years ago. We’ve had smaller one in the last 5 years, one or two, and when I say smaller ones you’re talking less than $100,000 to rehabilitate type scale whereas the other ones you’re talking in the millions. It is partly because unless the resource is super clearly finished you’ll generally find someone else who’ll come in behind it... there is a small one we rehabilitated for about $50,000 and we’re about to put it back out on the market again... we’ve got two applications already for a license on the site where someone had walked away because they’ve gone into receivership. (went straight from operating to receivership)

There were cases like where a major company sold a mine in another state that needed rehabilitating for $1 or something silly like that.

The way it works, in WA, under the Mining Act, a tenement can basically be sold or transferred to anyone else within reason so say a company has gone into C&M and another companies expressed an interest in taking over the site and they come to a financial arrangement, not that difficult for a company to lodge a transfer of tenure to that new company. As soon as that company takes on the same tenure, they take on all the approvals and obligations that existed. So for them to start mining again if they’re going to essentially comply with all of the approvals, just carry on with the same approvals what’s actually allowed under those approvals, they can actually start operating again they will just need to notify our safety people that the recommencement of operations. More often than not when a company takes over another tenement the company will want to mine in a slightly different way or change something so often, they need to come to us and get a mining proposal approved to change their operations.

Yes well those sort of scenarios do occur... where companies go into administration, it’s in C&M and it goes into administration it’s effectively still in C&M we expect the administrators to still report and still do all the necessary reviewing so there’s an obligation that they still do that work to keep the tenements in good standing because it’s in their best interest as the administrator or receiver to keep the tenements in good condition because that’s the asset that they need to sell you can’t really sell a pit with no tenement so they’ve got to keep the tenement in good standing so that occurs then the new buyer picks up the tenement and the mine and until the recommence mining operations on there it will remain in a C&M phase but the ownership transfers from company A to company B with the receiver in the middle.

### 5.6 Bonds

**Int.** Bonds

**A1** So, if they’ve got very good process on progressive closing - that ranges from doing your technical studies, doing active in the field earth works, better planning then that puts everyone in a much better space. Otherwise reactive stuff isn’t going to help anyone. That’s what the bonds are for, the reactive situation.
In the past the answer to that has been well worried about that when we need to worry about it. That's why government has always had the environmental bonds where you've estimated your closure costs and rehabilitation costs and you've had to put that money on deposit. If closure is to occur that money is there in the bank and that money is there to do that. That didn't help you if a company went into administration and was gone. Hence why we brought out the MRF where each year we estimate the value of our closure cost and we have to contribute 10% of that on an annualised basis into the combined fund. That fund is administered government and that it's already reached a level where it is such that... and I'm making this number up... but there's an extraordinary amount of money in there such that if 5 or 6 or 20% of the state's mines were to shut down there's enough money in there to cover the full cost of closure of those things and then the full cost of their ongoing maintenance and monitoring and stuff in perpetuity.

The market this days are also doing all that itself these days it's starting to self-select. So if we talk about Elderdale and Kimberley diamonds the board of that company, everybody knows what happened there and we take the opportunity to remind investors and other people of just what happened and who they should give money to and who they shouldn't. Because if we don't do it who else is going to. In the context of theirs particular individuals who are trying to pop back up, while we can't stop them, sadly, we do take the time to talk to people and just go "you might not want to support that." And very much the government these days goes "we know who you are - your bond is going to be this big (indicates really big) not that sort of thing (indicates much smaller amount)." There's a number of mechanisms in place, coz it is actually quite a small world and through the self-regulation we try to achieve what we can.

(IAW) we still have bonds but it's just discretionary now, whereas before it was mandatory it's now discretionary. Because of our MRF and they are effectively putting in 1 to 2 % of their supposed rehabilitation cost - the Department doesn't quite have the comeback. The way that it works the MRF builds up some money but whether or not, what money they can spend on a site the site actually has to become abandoned first.

The bonds are invariably low. They don't actually cover the cost of closure... anywhere, even when DMIRS applies bonds here in WA they're too low. You've got to remember that a bond is basically to cover what the Government sees as it's liability. So, it's not there to cover the company's liability. Companies have legal obligation and they also have what they call constructive obligations so constructive obligation is something like say a company is signed up to an industry standard or an international standard or something like that - that's not actually a legal obligation so the Government can't actually hold them to that standard. But because they've made that sort of commitment publicly then there is a broader expectation within the community that that's what they will do - that's called a constructive obligation. So, the bonds which are basically determined through a financial assurance estimate really only cover legal obligations, what they are legally required to do it's a different scope of work. But invariably when you actually look at the cost of what's actually required what the government will do is effectively a C&M strategy. They primary objective of C&M is to make the site safe and stable - which is oddly enough the same for closure - but in effect they will go in remove the hazardous chemicals they will basically make the site safe in terms of restricting access these sorts of things and that's what the bond will first be used for. So, where bonds have been accessed before for sites that's primarily what the government will do and then once it's spent that money, it sort of sits back and says now what will do.

It's a broad industry there will be undoubtedly there's good performers there's companies that think it doing reasonably well, a lot of other mid and small companies doing it reasonably well but without a doubt there's out there are companies that perhaps aren't performing like they should and certainly with the values that industry should be operating. C&M shouldn't be used as a pathway to abandonment, mines should not be abandoned that's my absolutely first position, if there are operators out there performing like that then we absolutely agree that there need to be appropriate regulatory safeguards to stop that happening and that means an appropriate amount of bond with government whatever arrangement government chooses to make on that so as a liability it's not left with government but also it's an incentive for companies to close mines properly but also there needs to be appropriate monitoring an airg in around the regulation of those activities as well to avoid that happening.

C&M certainly isn't abandonment, abandonment is not something we ever want to see in the industry, quite clearly. That means a company has defaulted on its obligations and walked away. Regulations have matured to a point, I think, where that is pretty unlikely. Governments have safeguarded through the bonding mechanism. Abandonment I think is the poorest end point for any mine site, in this day and age we would not want to see that whatsoever. And as I said I think safeguards are in place to avoid that happening or at least secured funds to cover any liabilities remaining should government be left with that liability. That doesn't happen very often I would certainly hope.

These days they have bonds which are applied... they'll (Dep't mines) apply bonds to ensure they have adequate money to rehabilitate a site when a mine closes down. To deal with old historic areas where you might not have that bond there, it's still more beneficial to have someone there mining the operation and getting them to manage the pollution from the site rather than having no-one there and you've still got to deal with the pollution but you don't have anyone there to manage it... sometimes it gets to be a bit of a line, do you say ok well let's do this provided you manage these other areas. So I suppose it become a bit of a balancing act within the site where the site itself be the only source of income for the community or you have historic workings or a historic mine site which is still being mined but you've got this huge legacy, so how do you manage that legacies do you try and get some benefit out of managing those old site by allowing the current operator a bit of leniency, for want of a better word, but still staying within the legislation.

When we get a MOP, they are also required to submit a rehabilitation cost estimate. Which we use as a base guideline to determine how much of the security we would hold for that particular site, which they submit to us generally as a bank guarantee but there are some sites that do offer cash. But that's that security is what we hold until rehabilitation has been completed to our satisfaction and in accordance with the mining lease and in accordance with the relevant development consent.

That's been said. Well here it could be, however in this jurisdiction I come back to the fact we require a 100% security upfront. In Queensland I think the bonding system is different. Now, if I'm holding a couple of hundred million dollars against you cleaning up the site, pretending to look after the site for ten years is that's been said. Well here it could be, however in this jurisdiction C&M is an option, but I think's it's not a very long-term option, whether you can legislate a period time is very tricky. But if you have the bonded security situation in hand you've mitigated your risks. As long as you've got the bonding right it really doesn't matter what else happens.

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In Queensland if you're not fully bonded then you could just string out the C&M and then possibly eventually go into liquidation and hand the liability for clean-up back to government. Which is why I like the 100% security upfront. I'm not sure that is a universal requirement across Australia.

We consider that as and end of pipeline solution... As part of our regulatory oversight over that sight we'd be issuing directions at that site well in advance that that well before that would occur. Obviously there has been times in the past where that regulatory oversight hasn't been that far.

C&M is an option, but I think it's not a very long-term option, whether you can legislate a period time is very tricky. But if you have the bonded security situation in hand you've mitigated your risks. As long as you've got the bonding right it really doesn't matter what else happens.

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Oh look, here we take cash or a bank guarantee on an Australian domiciled bank or registered with the prudential registration authority. So, a Hong Kong or Shanghai bank if they have a registered branch and secure reserves in Australia but the bank of Cayman Islands won't.

Yep for smaller companies that's not uncommon. Larger operations, the usual thing that happens, the operator will put cash in a locked deposit at the bank so they get the interest on that money but they can't touch the principal because that's the guarantee, that is the security against which the bank issues the guarantee.

The other example, that I don't see here, but is used in some jurisdiction in the US, they will take unencumbered real estate at their valuation. So if you've got an apartment block that you own they will hold the deeds, the office of surface mining, they will hold the deeds for that property but they tell you what it's worth, so the mining company says this is a 1 million dollar apartment block and department says no it's $520,000. Or the other thing they will take in the States is they will hold government bonds. So, they will accept bearer securities which means again that any interest accruing, accrues to the company.

In our system here because we hold the cash as the deposit there is no interest for anybody, which upsets a lot of foreign investors particularly the Chinese, well they say look your holding 2 million or 20 million dollars there's interest to be made why don't we get it, well the answer is nobody gets it, which I must admit I think is pretty dumb but that's the law.

My personal opinion, long held, is cash is king, hold the money and re-assess reasonably frequently, annually perhaps for some things, it can take you a long time to work out. ERA...announced that they had previously told the world that their rehab costs was $520 million and now they're saying it's $790 million. They're being very transparent which makes a pleasant change.
We believe that our financial assurance scheme and the discount system that we used to have would promote rehabilitation - it clearly didn't. We have fought particularly for our mines we've upped the financial assurance quite substantially with everybody because they don't do trials on waste rock dumps on tailings so we always put a conservative cap on it because it's expensive - so that's driving some trials to be done. I think industry fought pretty hard against this new Bill (reference Nov 2018 Bill) ... I think it's primarily around timing of when do you go into rehab, voids and residual voids and them not having a land use they're the issues that are really problematic.

We can review bonds at any stage, the first check we do when a company goes into C&M is do we hold the FA that we think we should hold, is the amount of disturbance still the same as what we calculated the bond on there's always a few checks you have to do first up. Then if we think the outcome of that sort of audit type scenario is that we have more disturbance than what we thought they had then we re-calculate the bond but if disturbance on the site is commensurate to what we calculated the FA against we'll keep the FA as it is.

*bonds * I think it'll work. There's always challenges making sure you have the right IT, making sure nothing falls between cracks, I think it will be better than what we have now because at the moment what we do now is we set the FA for resource projects so we set the FA we send the notice out and advise other Departments, the Department of Nature Resources, we then set a reminder in our calendar to ring up NRM to see if it's been lodged because people have to lodge currently you have to lodge it with NRM not with us so we have to check in and NRM haven't got an automatic checking system so at the moment it's all done manually and what I understand in terms of what we're building is an interface with Treasury so that will all be more automated now so the comparison between what we hold and what we need to hold is going to be done a lot more thoroughly I think.

The bonds are reviewed and adjusted every, at the minimum every five years. Every time you change your environmental authority when people come in and amend their environmental authority, you have to, at the moment, (something) operations, in the future it will trigger a new ELC(?) calculation.

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"We've heard from people actually on the go that the bond protects the taxpayer and the state if they have to step in and do rehabilitation themselves. Now these bonds and increasingly being called for 100% or even 110% of the liability of that so we have a bond calculator which we use to independently or internally assess what we see the costs would be for us, not necessarily the miner, so for the government to come in is probably a little bit more expensive than the miner would do, and meet the rehabilitation obligations as specified in the PEPR or in the environmental operations plan is under, at any time. *bonds * We're aware that the miner can go bankrupt or pull out at any time and the bond is basically for the protection of the taxpayer and we have called on a bond from time to time.

We believe that our financial assurance scheme and the discount system that we used to have would promote rehabilitation - it clearly didn't. We have fought particularly for our mines we've upped the financial assurance quite substantially with everybody because they don't do trials on waste rock dumps on tailings so we always put a conservative cap on it because it's expensive - so that's driving some trials to be done. I think industry fought pretty hard against this new Bill (reference Nov 2018 Bill) ... I think it's primarily around timing of when do you go into rehab, voids and residual voids and them not having a land use they're the issues that are really problematic.

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* bonds * So we chase everything up that we know, at the moment we chase everything up like do we hold the FA and we have the problem at the moment that lots of people like to give us cash as opposed to bank guarantees particularly smaller companies the problem that is that it's not necessarily secure particularly if they go into liquidation because other creditors might have a claim on that cash so we struggle with that a bit so we have a whole process if people want to lodge cash we have a whole process like some legal agreement to say that no-one else can access that cash. Those people that stuff up cash are generally the smaller companies and their likely to go into the fullfund.

"We're working with financial consultants at the moment to basically do a corporate capability and risk assessment... that will be applied to all companies and out of that they will be given a risk category from low risk to high risk... depending what categorisation your put into the amount of financial assurance and how you pay financial assurance for your rehab costs is going to be calculated. The idea of the rehab costs, the mine gets close out according to a progressive rehab and closure plan."

"We've had 4 operations go into liquidation over the last two to three years... the circumstances leading up have been various. One of them is because the operation had a major disaster on its site and was closed down by government because there was ongoing concern about impacts. One was because it had been struggling for years and years and when we asked them for increased financial assurance, they decided that they would get out. Another one had come to the end of its mine life, it had been sitting there just waiting around maybe someone wanted to do some final mining of the remanence of the ore body and no one came along so in the end it had got to the point where the company ran out of resources and again declared bankruptcy."
involved in the process now there needs to be agreeance million dollars to recover $20,000 so they were quite a powerful, even just purely from a reputational and financial perspect to be a difficult process. Our bond requirements is that their unconditionally guarantee by an appropriate and approved finan step in to make sure their closure planning is up to date make sure they’ve got some good time frames on when they’re going to get back there and mine or whatever: and we obviously hold a sufficient bond to go back and do the rehabilitation.

When a mine goes into C&M they lose 99% of their staff usually, you also lose a lot of expertise, plans, programs they all get lost there’s not a lot of continuity you can get bought out by a smaller miner and so at that time if someone else buys it out while they’re in C&M you should be able to look at if they have the capability and the capacity not just to do the mining but to do the rehabilitation as well. That’s one of the key things when they go into C&M is how does their capacity to do the rehabilitation change and making sure the bond reflects that even if the PEPR, the environmental criteria that they have to meet remains the same.

With legacy sites and abandoned site Mineral Resources Tasmania, Department of State Growth, are the lead agency that look that after. MRT is the body that administers the bonds or the financial assurances on the site, we are obviously work with them on setting those bonds. In the past they’ve deemed to not be adequate so their going through the motions at the moment to review existing ones and increasing them if need be so we that have adequate coverage should sites be abandoned and become a legacy for the state. We certainly have a significant number of legacy sites that are dealt with through the Mining Rehabilitation Fund Committee. Obviously, that’s only a X amount of money budgeted per year, so areas have to be prioritised there for clean up or works throughout the year. That’s so that generally how that’s managed and that’s how managed through MRT with some input from the EPA mine section, which has a member that sits on the committee for the Rehabilitation Fund.

It’s MRT that would relinquish any remaining money if a site been rehabilitated under conditions, and regulation by EPA if it’s deemed to be satisfactory to EPA. Any bond held gets relinquished through MRT.

part of our conditions either require a mine closure plan to be submitted within a period of time and then reviewed periodically so you’ve always got that level of assurance and that includes cost as well, that the activity are aware of their closure liabilities and that feeds in to MRT reviewing the financial assurance or bond for any activity.

The other thing they need to start mining is a bond which is a financial assurance / bank guarantee that means if they go into liquidation or are unable to pay for the remediation themselves we can draw on that bond, as government, to do the remediation.

(bonds intended to cover 100%) They’re intended to do that yes. There is a danger that for one reason or another if they’re not up to date that they don’t. The aim of the program is that they have full coverage.

The other part about C&M is we would check that the company has an adequate bond in place that would be a potential warning sign to us. You know you’ve gone into C&M the economics might not be as robust as they were it’s certainly worth reviewing the bond and seeing whether that should be increased to make sure it’s the full amount. Just because the likelihood of them going into receivership is higher when they’re in C&M as when they are operating and making a profit.

We can use a notice the minute we think there’s a risk. The notice is set up for two things non-compliance which is harder to prove... the one about risk - if a significant risk is identified we can use a notice telling you to address it whether that means for rehabilitation or just having the steps in place to manage it or increase the bond is another thing we can require.

We’ve being increasing our bonds in recent years ... some of them have definitely been to lower... I think if you’ve got a strong bonds system in place there’s not the same incentive for companies to misuse C&M or pretend that they’re not really closing down. There’s a requirement for the regulator to be active on that... we’ll tolerate C&M for 2 years but after that it’s like uh uh start rehabilitating or give it to some else.

if a significant risk is identified we can use a notice telling you to address it whether that means for rehabilitation or just having the steps in place to manage it or increase the bond is another thing we can require.

So, I think the toolkit is not too bad. It really is more, to me as a regulator, to have active management of it, make sure there’s enough bond in place, make sure we go out, if we find out someone is in C&M go out there early understand their staffing understand the resources they have available to make sure they do it properly and then set out inspection frequency accordingly.

Whoever is owning the tenement at the time ... all of the obligations keep occurring while the sites in C&M so for example they need to keep paying into the Mining Rehabilitation Fund so there’s no exemptions if you’re in C&M you need to keep paying your rent on your tenements you need to keep owning them... whenever is taking over the site just inherits that and if there’s any bonds on the tenement they would have to place the same bond with our Department with our Minister, and the other one would get withdrawn... There’s no real hindrance from it (getting out of C&M) unless they need an approval from us in which case we just need to go through that process.

*
"(corporate risk") Imagine there’s a big mine and they’ve been mining all these areas and maybe they started rehabilitating a little bit and maybe there’s still a lot of rehabilitation that needed to be done and they suddenly went into C&M and they sold it to another company that company coming in might be a little bit and this is a cycle that we do see sometimes, sometimes it might be a smaller company with less resources who might buy because they see an opportunity - doesn’t always happen that way - sometimes is happens the other way round and a bigger company takes over - all this mining’s been done over here but they’re actually saying we’re going to keep chasing gold in this area and the might not actually end up having the wherewithal all to actually rehabilitate everything and take over all those liabilities but the other company is already gone. It’s on the companies to do their appropriate due diligence to make sure they can actually undertake all the rehabilitation that remains and all the closure that remains on the site. If we’re seeing signs there’s a risk there that when we need to step in to make sure their closure planning is up to date make sure they’ve got some good time frames on when they’re going to rehabilitate things that we can hold them to it... if any of those things are flagging risk to us that’s when we look at, are there additional financial assurances required for this site.

The capacity to impose bonds is still there, so we still have the ability to impose bonds, the process and procedure to do that is more complicated now but that still exists. But as I said if we’re then trying to apply bonds at a time when the company is in dire straits it’s going to be a difficult process. Our bond requirements is that their unconditionally guaranteed by a proper institution and approved financial institution so you’ll find it difficult to get banks to provide bonds to the Minister for a company that might not be financially strong, so it’s a difficult time to do it, so to asking for a bond. The most effective time is upfront. The MRF process is just a contribution on an annual basis based on the disturbance footfoot and the nature of the disturbance and it’s been deemed at this time that its 15% of the closure costs it’s going to take some time to build up the fund. We had well over a billion dollars in UBPs. But the performance bonds also had a value because if a bond was enforced it would provide a negative impact to the company from a financial borrowing perspective, so if they had a bond enforce for environmental reasons a lot of financial institutions would identify that as being a high risk and they would a lot of things to protect that bond. There’s an example where we’ve had a company spend in the order of $2 million dollars to recover $20,000 so they were quite a powerful, even just purely from a reputational and financial perspective so they do work well, we still have them, they’re still available... they can be applied anytime but the process is. there are a few more people involved in the process now there needs to be agreement... (see website)
What was found is that the value of what we had held in bonds if there was a significant default wasn’t enough to clean up what was on the ground... it was quite a very effective tool and there was only one person in the department who ran that whole bond process. We would set them as part of our assessments and reviews so when we’d do an annual review if we deemed the bonds needed adjusting then we’d adjust them but it was managed by one person so the onus was on the companies to manage it all. I guess with this other one, the MRF, the onus is on the Department to make sure people are paying it, where as in the past if you didn’t lodge your bond you didn’t get your approval, there was an incentive. If you want to start mining, you had to lodge the bond. There were certain projects where they couldn’t get funding from financial institutions, so the projects didn’t proceed. As with the MRF there is no upfront hurdle they can start as long as their paying their annual calculated contribution and there is that obligation there to pay and meet all the other requirement and they can continue to mine.

5.7 Regulatory Options

Int. Forcing Closure & Rehabilitation

B2 We can direct them to issue a MOP for closure. Transfer them from a C&M phase into a closure phase.

B3 In the case of one mine I can think of, after being in C&M for 5 years, the regulator said ok we’ve had enough, for a whole lot of reasons you’re not ever likely to restart, you are now directed to dismantle it. I’m assuming that would not be a unique case.

That said there are miners that do put into C&M to try and for stall their rehabilitation requirements and it really depends as a regulator ourselves, how long do we give these miners before they actually have to do their rehabilitation. That’s a difficult one for us often we give them a period of time to do the works but you know - hanging I guess the re-opening of the mine or an adjacent mine down the track doesn’t mean they don’t have to meet their rehabilitation requirements. After a couple of years or so of C&M we’ll either be pushing the miner to recommence mining, if that’s what they want to do or rehabilitate the site with an aim towards final closure and transitioning to other land use

The rule we’ve got is kind of 2 years C&M without concern. Anything longer than that and we say hang on isn’t this really just closing down and it’s time to start rehabilitating. (Is the 2 year rule a hard policy thing or internal practice?) There are certainly limits on how long some of the things can be in place, but that I think is one say more of a practical... there is the ability for us to do it for even less time... We can use a notice the minute we think there’s a risk. The notice is set up for two things non-compliance which is harder to prove... the one about risk - if a significant risk is identified we can use a notice telling you to address it whether that means for rehabilitation or just having the steps in place to manage it or increase the bond is another thing we can require.

Cancelling licenses (looks to me that this would be done so that the government can facilitate the sale)

As time goes on and they continue to have it in C&M we do what they call ‘good faith provisions’ under the Mining Act. So, if you look under section 125 which is ‘grounds for cancellation of authorities’. We’ve just gone through a bit of an exercise where we’ve identified a lot of sites that have actually just been in a holding pattern for a number of years. So we’ve actually sent out a ‘show cause’ letter to all of the sites to say well show cause as to why we shouldn’t be cancelling this lease particularly around the good faith argument which is section 125.1.g that they need to demonstrate that they’re actually utilising - well that the decision maker is satisfied that the holder of the authority has failed to use the land the subject of the authority in good faith for the purpose of which the authority was granted or has used the land for a purpose other than which the authority has granted. So that’s our hook in terms of actually having a site continue to go on in C&M, they need to demonstrate to us as to why there’s still utilising that land in good faith.

Typically mineral leases, or mineral tenements, only renewed with a view that they are going to be mined or rehabilitated you can’t hold on to them indefinitely, we take a bit of a dim view in regards to land banking - so holding mineral leases over an area where you’re just waiting for the commodity price to recover because at the end of the day it’s in the states interest to get someone to extract these minerals and obviously get some royalties in an environmentally sustainable way we don’t care who does it. If we think the tenement can be extinguished and another miner can peg a claim over the top and re-start mining quicker than the existing miner, we’ve got no interest in trying to encourage land banking and holding on to that. That said it happens a lot less than some people may think.

Very rarely. We’ve kind of got a sliding scale of enforcement from negotiations and coercion all the way up to formal letter and then fines and really we only extinguish a tenements in extreme circumstances when it’s proven repeatedly that the miner can’t continue to mine or meet their rehabilitation obligations. Before we relinquish tenements, we would use the bond to do the rehabilitation ourselves..... then we’ll see out the rest of the tenement and then we just don’t renew it, it will be surrendered and then the miner walks off.

The length of mining tenure has reduced as well. So where we use to give 21 year leases they usually the write up formal letter and then fines and only we extinguish a tenements in extreme circumstances when it’s proven repeatedly that the miner can’t continue to mine or meet their rehabilitation obligations.

We’ve certainly had ones where we’ve cancelled licenses

The annual reports, that obligations remains when a project goes into C&M so there is a requirement to lodge an annual environmental report in accordance with the tenement conditions failure to do so could render the tenement liable for a fine or forfeiture because it’s a legally binding requirement.

We’ve got powers under the Act that we have to require them to do particular things... it’s either compliance so there’s documentation where they have to do things if they’re not doing it then that’s one process; the other is if what’s happening is called ‘detriments and harm to the receiving environment’ if there’s significant detriment or harm being caused then we have capacity to issue orders such as directions to modify a written order with a time to be met by failure to do that constitutes as a breach of the Act and they can be taken to task on that through the court process. If they breach of conditions, then it could render the tenements liable for forfeiture.

Coercing & facilitating the sale of C&M sites (some respondents say they are active in the sale and others more passive - those that are active may only be active when a site is abandoned)

There are requirements there it’s probably more of a case if a company just winds up rather than going into a c&m mode where they just probably say ok well it’s no longer profitable for us to do it so we’ll try and sell the facility but stay here until we sell it. The ones that give in to the problems are when they just go the company ceases to exist we’ve got no assets its gone to a receiver your dealing with an accountant that comes it that doesn’t know anything much about the mining, he’s trying to get the best he can out of the liquidators for the people who are owed money. I’ve only had that happen once.... it all happened pretty quickly the resource was picked up fairly quickly by the new operators, so it wasn’t too bad.

If a new owner comes in and purchases that they may well take on the liability of past activities. It’s a bit of give and take, if a mining company comes in and want to start with a headache from someone else’s poor practices, but those practices occurred many many years ago, and obviously what they did back then we wouldn’t allow now. Certainly, any legacies at a mining site, and a new mining company wanting to come in and mine it they are considered that they will have to take on those old legacies and try and rehabilitate them if they can. Sometimes with those efforts it might be a joint negotiation, they might say well if we rehabilitate this area, or we might be willing to do this but we’re not willing to do that, or we might do this if you help us out with some funds to do the rehabilitation work. It’s the case of you’re better off having them in there to do the works, and maybe do the mining and maybe do some rehabilitation works rather than not having anything done. At the end of the day you want a win win situation, a win for the environment and a win for the company – they’re the best outcomes if you can get them.
Ah look when there is a break in tenure, so the legislation is pretty clear, when there is no break in tenure the new company is responsible for the previous harm and previous disturbance, so if you have the tenor just goes from you to me that's fine if there's a break in tenure and there was an abandonment the company can argue that the previous harm isn't there and we can't allocate financial assurance for it and blunder you negotiate out that they are responsible for that they might be able to not take that on. We can always negotiate because they need to get an environmental authority from us, but it's a neat process.

The only benefit I see of people going into C&M rather than other selling or going into liquidation - it can be on sold over time to a company that might be able to make money out of it. We do see a lot of bigger companies selling their less profitable sites to smaller companies because they have less overheads so we find mines generally will move through the hands of various people particularly towards the end of mine life. Probably 80% of them get sold, some go back into production, and probably 10% - I'm just guessing here - 10% go ultimately into administration and liquidation. Look they go through the administration processes get sold through the administration process... we've got three mines that have been abandoned in my area since I've been here. Formally abandoned, liquidators basically just disappear it like an incumbent asset under corporative law the state becomes responsible for them... the ones that are totally financially unsound will end up being sold or being abandoned. When they on sell we generally will get the company... come back and say we're going back into production what do we need to do so most of them once they get sold go back into production.

There's otherwise other sites where a mine goes bankrupt, administrators take over now that can go into C&M as well, so I've got a number of sites that I look after where administrators are responsible for the C&M and that's a bit more difficult because there's no real active rehabilitation going on and you are waiting for another buyer to come in and buy out the stranded asset and some of the rehabilitation obligations.

If we think the tenement can be extinguished and another miner can peg a claim over the top and re-start mining quicker than the existing miner, we've got no interest in trying to encourage land banking and holding on to that. That said it happens a lot less than some people think.

Over 15 years ago. We've had smaller one in the last 5 years, one or two, and when I say smaller ones your talking less than $100,000 to rehabilitate type scale whereas the other ones you're talking in the millions. It is partly because unless the resource is super clearly finished you'll generally find someone else who'll come in behind it... there is a small one we rehabilitated for about $50,000 and we're about to put it back on the market again ... we've got two applications already for a license on the site where someone had walked away because they're gone into receivership. (went straight from operating to receivership)

The way it works, in WA, under the mining Act, a tenement can basically be sold or transferred to anyone else within reason so say a company has gone into C&M and another companies expressed an interest in taking over the site and they come to a financial arrangement, not that difficult for a company to lodge a transfer of tenure to that new company. As soon as that company takes on the same tenure, they take on all the approvals that existed. So for them to start mining again if they're going to essentially comply with all the approvals, just carry on with the same approvals what's actually allowed under those approvals, they can actually start operating again they will just need to notify our safety people that the recommencement of operations. More often than not when a company takes over another tenement the company will want to mine in a slightly different way or change something so often, they need to come to us and get a mining proposal approved to change their operations.

"We're doing that at the moment with a site where there is quite high risk of abandonment because of the situation, they're in C&M and the corporation is in receivership. There is a lot of money being spent on this mine during the period of C&M, by receivers to just maintain things in an operating way. The cost of that is in the vicinity of $1 million a month... when it's been in that state for over 2 years, it's not generating any money it's a big drain on someone's finances. It's in the government's best interest to see that site sold to another operator who is going to resume operations and then go through the closure process properly rather than just abandon and just disclaim it back to the state. The remediation of that particular site... would properly cost more than the entire fund holds at the moment. Would we do that, would we actually do what needs to be done, and the answer would be no we wouldn't do the full proper closure and rehab we would just do the minimum to make things not critical."

Amending Conditions

Perhaps some of those issues the intensity of work on some of those other matters whether it be environmental monitoring and others might decrease. For example, if their monitoring air emissions and there's no operations they can start winding that back. They certainly need to keep the core of their environmental conditions met

When they do go into C&M primarily, we don't normally have anything to do with dust monitoring or air monitoring because in that C&M mode there's no activity occurring on the site, or there shouldn't be.

We'd also be looking at what monitoring programs would be continued and determining if they were appropriate or not and then negotiating as required. We'd possibly even be directing for certain monitoring as required.

Generally, its (a pseudo C&M plan) required via our conditions under the land use permit or an environmental protection notice if it's been issued on the site to vary the conditions of the permit. Generally, there is a condition in there for temporary suspension of the activity and under that condition the director of the EPA can require a C&M plan if notification is given of suspension of operation.

E.g.,... in dropping the monitoring we just did that by letter of agreement it was effectively saying we will not enforce that condition in the meantime because you've given us a reasonable rationale and rather than do all the paper work - as something that is a reduced risk we could do it that way for an increased risk we would use a notice.

As part of the monitoring program they needed to monitor cyanide in the air above the tailings dam because there are neighbours not far away... they kept it going for another 6 months after they finished applying tailings, because they're in C&M they still have the tailings dam but there were no fresh tailings going in and after 6 months of monitoring showing that the results were 'not detect' they put it to us that can we turn this program off until we start applying tailings again and we agreed to that... however, the groundwater monitoring under the tailings dam - it's about making sure what seepage going on - we said has to continue you might have stopped putting things up in the top, but things haven't stopped seeping out the bottom.

The other one is are there any activities that require ongoing attention. An example... is the way the water management occurs - its corrosive materials and we could get instability in the batters if the water management isn't maintained... they turned the staffing right down to half a dozen people for an area that used to have over 100 people working there and they were almost pretty much security guards. So, the question was in terms of the monitoring did they have sufficiently trained people and sufficient number of people to do the job... we had a situation not long after they went into C&M where there was a heavy rainfall and they hadn't picked up an issue where a drain had blocked, and we started to get erosion occurring. As it was we happened to pick that up a day or two after that rain event and we asked the company to increase the amount of monitoring and increase the amount of monitoring and increase the training for the people that didn't really do as well as to what they were looking for... for the monitoring use to be done by a lot of experienced people... it's a lot more vulnerable when it goes back to a skeleton staff that there's a risk that key maintenance duties or key environmental or public safety risks won't be in place.

Requirements to still meet all of their reporting obligations and any other obligations, they may seek exemptions from particular things like stock monitoring if emissions aren't occurring, or pressure testing if vessels aren't operating

the Minister can impose conditions at any time there's no restriction there. And at some stage previously we use to impose a C&M plan requirement as a tenement condition to lock that down as a requirement and get a timeframe to get it lodged by and that can still be done there's no restriction on that... it tends to be a case by case and what the status and the scenario is for the C&M. There's so many varied reasons.

If we were looking at an annual environmental report that's been submitted. Almost every premises regardless of what they do has to submit an AER, once a year, we generally have a quick look at that to identify whether there's any flags, any risks as soon as we receive it. Then it goes into a program for more regular assessment based on risks. Through this process we sometimes identify risks associated with care and maintenance or a company being at risk of going into care and maintenance and that having subsequent risks. Then we would do something about that through the assessment. So that would trigger us to do our own initiated assessment and make some changes so that they were required to notify us or that if they were going into C&M, they had a requirement to undertake a certain set of actions.

Which might be things like an inventory of all the reagents in storage on site.
One of the other triggers for people to notify us, is that there are fees associated with annual operations, the start of every annual period which is defined in the license, you have the premises component so that's based on the category and it's based on the annual throughput so that can go up and down a lot if you're talking about something that might be like a 5 million tonne a year operation and they're going to nothing; they would probably want to pay the lowest fees applicable for the year. So sometimes people come to us and say we're going into C&M and our annual fee is coming up we want to amend our license down to the lowest level so that we don't have to pay much in fees.

That's one of the other reasons that the department becomes aware of C&M because they'll make an application to us to make the monitoring frequency reduced because it's quite expensive. We would generally, again we've got an understanding among the people who work in this area all the time, that the appropriate response to that application is x, y and z, sometimes we say yes and we say no depending on the setting and what it actually is that they've requested. Again the number of times that that comes to us versus the number other applications that we deal with, that's not written into any guideline or procedure or any form of guidance externally or internally for how to assess, that relies on people making a judgement on the circumstances.

### Increasing bonds

see table above

### Notification

**B1**

Part of the license, they have to do an annual return, that annual return is the reporting system and they are required to notify us, also when things go wrong... certainly they are required to notify the agencies.

When people go into C&M basically what will happen is generally speaking people will call us... unless people formally notify us, or we see it through ASX announcements ourselves - there's no formal notification process in QLD at the moment. But we generally will find out through somehow shape or form, through our friends at NRM or through the company that they've gone into C&M. Our response from there is generally we'll talk to the company and say 'look what you are doing' making sure they will still adhere to their environmental obligations and if required we will issue documentation either an order or something to make sure they will continue to do so. But in the first instance they become what we would consider 'higher risk' so we would send our compliance team out there to make sure they still complete all the works required under the environmental authorities.

**B4**

When a miner goes into C&M, they're still obliged to meet conditions under their PEPR... often they will notify us when they go into C&M or we'll often know in advance.

Generally, its (a pseudo C&M plan) required via our conditions under the land use permit or an environmental protection notice if it's been issued on the site to vary the conditions of the permit. Generally, there is a condition in there for temporary suspension of the activity and under that condition the director of the EPA can require a C&M plan if notification is given of suspension of operation.

**B8**

When you start looking at individual sites some of them might have commitments or obligations in their approvals that require them to notify us at certain stages but it's not a standard thing across the industry.

**B12**

Notifications under Mines Safety and Inspection Act 42/88. We tend to look at sites holistically from a C&M perspective more so that just looking at an isolated pit.... We wouldn't get notified down to that level... but it would get conveyed through annual reports... so we'll get communication through that process. Some of these sites might just be like a little prospecting or dry blowing type operation, cuz MINEDEXT captures all mines and all mine features they (companies) don't have to [notify going into C&M] by the general provision of any act but there is sometimes a condition on a license that would require them to notify us. These are ones where we've identified risks associated with the company going into care and maintenance. It's usually the types of activity that are a little bit borderline economically. Poor grade or they've got some other associated with them that means they don't make a heap of money or they've got quite high costs so they're likely to go in and out of care and maintenance frequently.

If they didn't have those conditions on them that required them to notify us, they may, or they may not notify us. They can if they want to, going through their own due diligence processes. One of the other triggers for people to notify us, is that there are fees associated with annual operations, the start of every annual period which is defined in the license, you have the premises component so that's based on the category and it's based on the annual throughput so that can go up and down a lot if you're talking about something that might be like a 5 million tonne a year operation and they're going to nothing; they would probably want to pay the lowest fees applicable for the year. So sometimes people come to us and say we're going into C&M and our annual fee is coming up we want to amend our license down to the lowest level so that we don't have to pay much in fees.

### Planning (see also Tab 6.1 row 16 - 26)

Certainly within (NAME OF CORP) we have it as a mandatory part of our risk assessment for closure that we actually consider if there's a risk of unplanned closure and how we look at that is you know so it could be commodity prices, I mentioned earlier about the position on the cost curve and margins, if you've got a single site at the bottom of that cost curve you would have to consider that that's at more of a risk of early closure than say one of the ones that producing most of your profit and therefore you should have a C&M plan at least a preliminary one in place that's ready to roll for that site.

Things like maybe geotechnical risks so as an example if you have a large pit even if you have a major wall failure and there's a significant resource left you'll probably still going to continue to mine because the economics suggests that even though it's going to cost a lot to reactivate the pit you're still going to do that. Versus if it's a single operator, underground mine and a single shaft if you lose that shaft the mines done, you're not going to start up again. So, should they have more proactive preliminary plans in place absolutely they should, and I don't think the necessarily do.

What we are trying to move towards is that it's more of a planned process so that there's actually a demobilisation plan in place, you understand what your key risks are you make decision on whether you should keep pieces of infrastructure in tact or actually demolish them for the C&M period what are your site security measures going to be are you going to have an onsite permanent security presence or not - those sort issues need to be taken into account.

I think it's changing; you don't see sites put into C&M without appropriate management as much these days as we use to. Maybe they're just getting better at hiding their intentions. It seems to be more of a defined process now. People do talk more about C&M plans and about C&M being a defined phase or something that people do.

The Act requires that there is a document called the Mine Management Plan which is updated annually or as required. If you go into C&M, then your MMP is the C&M plan. To maintain the authorisation there has to be an MMP. There was talk of revising the MMP template to include a C&M template but it's difficult because, as I said earlier on, each site is unique. Having a template is difficult, having a template for C&M is even more difficult - exploration seems to be fairly straightforward.
Absolutely... you know what’s truly care and maintenance. C&M you have to plan to restart, if you don’t it’s pre closure. You’ve got pre closure and you have abandoned mines. Three very different things. Leases get cancelled if we think you’re not meeting your obligations under your PEPR or you’re not going to get back there and it’s time to start rehabilitating. Often when you’re in C&M is concurrent with meeting parts of your rehabilitation. You can have both C&M and rehabilitation for example if you want to rehabilitate the pit or part of the abandonment bund around the pit you still want to keep the waste rock dump or the tailings open just in case you want to add to those or remine those down the track you’ll put the mine into C&M but you’ll do some rehabilitation so it’s not an either or whether you put it into C&M.

[Reviewing the PEPR on going into C&M] It can, but more often than not we continue with the existing environmental approvals. Because the PEPR has both operational controls, noise, dust, traffic, land access all those kinds of things as well as a closure plan - so all PEPRs are supposed to have a closure plan not all do but they’re all supposed to have closure plan and a progressive rehabilitation plan in there as well. Their monitoring and progressive rehabilitation can still continue under the existing the PEPR, that said if the company goes bankrupt or has been bought out by another party then that’s a good opportunity to have a review of the PEPR. So, the PEPR runs on a series of environmental outcomes and criteria so the mining company themselves tell us based on a risk assessment what they think the key environmental objectives their going to meet and what criteria they’re going to use. It’s based on a site by site basis, there’s no set criteria that all mines have to meet although there’s a lot of commonality as you can imagine but basically it’s based on how close they are to nearest environmental receptors, the size and scope of the mine the toxicity of the minerals that they’re extracting... their PEPR only has to be revised when that criteria changes. So if their just doing a minor change say expanding a tailings dam there’s no change to the environmental criteria, as in their monitoring program just stays the same there’s no increase risk offset things like that then they do it as a minor change under their PEPR. However if they want to come back and say for example they want to do monitoring once every year rather than quarterly or they want to increase their levels of contamination that can go into a watercourse or something like that, that’s when you recall a PEPR. Often you’ll recall a PEPR or revise a PEPR when there’s a mark change to the mining plan, as in you’ve got a new feature of the mine a new waste rock dump, a new tailings dam ... often when a site goes into C&M or comes out of C&M that’s when you’ll call a new PEPR. You don’t have to change the PEPR because you go into C&M often when they come back and want to change the way they mine or the environmental impacts of mining that’s when you do a new PEPR.

Generally, it's (a pseudo C&M plan) required via our conditions under the land use permit or an environmental protection notice if it’s been issued on the site to vary the conditions of the permit. Generally, there is a condition in there for temporary suspension of the activity and under that condition the director of the EPA can require a C&M plan if notification is given of suspension of operation.

Generally, it's required via our conditions under the land use permit or an environmental protection notice if it’s been issued on the site to vary the conditions of the permit. Generally, there is a condition in there for temporary suspension of the activity and under that condition the director of the EPA can require a C&M plan if notification is given of suspension of operation.

Part of our conditions either require a mine closure plan to be submitted within a period of time and then reviewed periodically so you’ve always got that level of assurance and that includes cost as well, that the activity are aware of their closure liabilities and that also feeds in to MRT reviewing the financial assurance or bond for any activity.

They're requirement is to have a license to access that part of the land. To actually do mining they need something called a work plan which is effectively an operational plan that explains where they will dig, how they will dig and includes how they will remediate. The other thing they need to start mining is a bond which is a financial assurance / bank guarantee that means if they go into liquidation or are unable to pay for the remediation themselves we can draw on that bond, as government, to do the remediation.

Because the work plans are quite detailed - the guidance and the policies are used to define the work plan in the first instance at the point of approving or assessing them once they’re in place we don’t so much look to the guideline as look to the work plan itself which are case by case site specific.

The other aspect is our mining proposals, especially under the new guidelines which were introduced in 2016 require people to do an environmental impact assessment and consider all phases of mining which can be planned and unplanned phases so really their risk assessment should identify what the risks are during C&M or a temporary closure phase that may be different from the rest of the phases and they will have management responses that they need to be doing in those phases. In some circumstances we may request a specific plan for managing C&M and essentially regulate them against that plan or impose specific conditions as to what they need to do in that scenario. So really its more just it’s part of our current regulatory regime that we deal with it we don’t have a specific policy that only deals with C&M.

I’m not aware of a specific policy that's specific to C&M only what does apply to it mainly is the Mine Proposal Guidelines and the Mine Closure Plan Guidelines and their both statutory guidelines. So, when a proponent wants to mine in an area, they need to lodge a mining proposal it's a statutory requirement that their mining proposal deals with things during C&M as does their Mine Closure Plan.

**Time Restrictions**

Whether you should say 5 years or 10 years I would say 5 years, personally. It’s certainly not a policy matter here at the moment. But purely and simply because I look at oh the NAME OF MINE I think, back in the 1980’s early 90’s there’s all sorts of things that can go wrong. I mean they mothballed the plant, they cleaned it thoroughly and all the rest of it but walking around on inspections after that time you could see materials rusting structures starting to fail through lack of use and deep maintenance. People who knew about the ins and outs of the plant moved on - that’s a significant issue on many sites.

The rule we’ve got is kind of 2 years C&M without concern. Anything longer than that and we say hang on isn’t this really just closing down and it’s time to start rehabilitating.

The length of mining tenure has reduced as well. So where we use to give 21 year mining leases to anyone who asks, now you often get a mine lease for 7, 4 or even 2 years if we think that you’re a high risk of not meeting your environmental obligations and often mining leases get cancelled if we think you’re not meeting your obligations under your PEPR or you’re not going to get back there and mine or whatever and we obviously hold a sufficient bond to go back and do the rehabilitation.

**Definition**

So if it is true C&M and that you intend to start up again, this is an interesting angle right C&M ... to me means that you absolutely plan to start up again if you don’t then it’s closed or it’s pre closure. So, consistency in terminology is really important. So, you’ve got C&M, you’ve got pre closure and you have abandoned mines. Three very different things.

Absolutely... you know what’s truly care and maintenance. C&M you have to plan to restart, if you don’t it’s pre closure.
One of the debates we've got going on at the moment around terminology is whether or not C&M and temporary closure are the same thing. Temporary mines closure is another concept that is used in mine closure where a site will temporarily cease operations - but I guess that's what it comes down to is that when they cease operations they're either going into C&M or their going into closure. Sometimes if they say their going into temporary closure then that really is a C&M operation. It's likely with an ISO standard and will basically say that... which will be interesting because there are some people who have very strong feelings that they're not.

In WA C&M is a defined term within the guidelines for preparing closure plans and it's also a defined term within the Act. There is a requirement in WA that when companies cease production, they are required to present a notice to the Department of Mines, and they are required to submit a C&M plan. Now there's no guidance on what that means, or what's in the C&M plan, but they are required to put one together.

There needs to be better definition and criteria around what is C&M. The government needs to define what it accepts as C&M. So a company needs to be able to demonstrate you know it's gone into C&M because of a shift in the market price or there needs to be some reasons, you know so a company needs to say 'ok we've met those criteria to say that we're in C&M. I would think that's the first thing - otherwise people can just use it willy nilly.

after a mine has closed and that is often confused with C&M is that period afterwards and yet it is type of C&M but it is really a monitoring and management period basically ensuring the closed mine is meeting its regulatory conditions prior to it being able to be signed off by the regulator, so they absolutely hold responsibility for that site at that point of time.

In terms of the relationship between C&M and premature closure, that eventually and not type of C&M but it is really a monitoring and management period basically ensuring the closed mine is meeting its regulatory conditions prior to it being able to be signed off by the regulator, so they absolutely hold responsibility for that site at that point of time.

I think a consistent understanding isn't a bad thing, I guess across the jurisdiction, I think that's useful. Because there is a lot of misunderstanding of what C&M actually is, from state to state but it also gets confused with lots of other things... I think the fact is that people are confusing it with abandonment which you know may have been identified as an issue with some operators in Queensland as you mentioned is certainly not what I would suggest be standard practice in the industry but it is a concern that people are confusing with abandonment because it shouldn't be the case so I think a greater understanding of what C&M would be useful.

It's just really you probably need to define what C&M is because people often want to come to us to reduce their environmental monitoring requirements etc. and that is a little bit difficult for us to administer because once you've amended the AIM in GLD your environmental authority is there forever so then you need to go ok while you're in C&M you don't need to do XYZ and 2 but as soon as you exit out of C&M you have to and that is not an easy process in the sense that because the definition of C&M isn't clear it's not that simple.

So a pit can be isolated and not mined for a while that doesn't mean it's been abandoned or whatever it's just 'isolated' it could be considered C&M but the projects not in C&M it might just be that one pits not being mined at that particular point in time. And if it is finalised then there is a process that needs to be gone through and sign off achieved for stating that the site has been left in a condition that's acceptable... with a pit for example... that the pits been appropriately bunded or backfilled or made safe, had the walls battered down, depending on what scenario your dealing with. In most of the cases with the deeper pits they tend to be just left as a pit void we accept that it will be a pit void and it's not really going to be pf any benefit in the future but it needs to be left in a safe condition with an appropriately established abandonment bund around that pit. They can sit like that for many years, decades and then someone can come back in the future and they might recommence mining, some of these might have underground developments at the bottom of the pits... things like seismicity can be a game changer when it comes to long term mining so it is that's not safe at that point in time to go back in, but with improvement or different mining methods there may be the ability to go back in and recommence mining. At some sites it might mean a big cut back, the pits cut back to a safer angle and any problematic material mined out and removed so it will then allow for safe operation at the dept of the pit. The costs of doing that is significant and then economics come into play about how much resource is there and it is economic to cut that pit back to go deeper to get that remaining ore, they're the decision that are informed through geological models, market conditions. There's a whole heap of drivers that would control how that occur. They Department and he Government don't really have a hand in that... it's the company that makes those decision whether about why they will go in this pit or not, whether they'll stop mining here and mine another pit for a period and just suspend mining in the other area.

So, if they've got very good process on progressive closure - and ranges from doing your technical studies, doing active in the field earth works, better planning then that puts everyone in a much better space. Otherwise reactive stuff isn't going to help anyone. That's what the bonds are for, to get people to actually begin on the rehabilitation. So, in effect the sites in C&M

I think there would be a benefit in some guidelines, to explain some of the things I'm saying so that everyone's clear about what would happen. I think most companies probably haven't thought that much about C&M.

...would more of a push to do it. At the moment, these kind of tasks that come in they're not related to applications we say this is something we should really do, we put it on our spreadsheet that keeps the list of all the jobs, but it's down the bottom, it's literally the last section on the spreadsheet. It's only one that people address when there's... it's reactive to an actual issue a rather than preventative to any potential issue

5.8 Rehabilitation

Int. Progressive Rehabilitation

(ideas on regulating C&M) I struggle to see what it could be because of the reactive nature of it. I think the only way you could regulate it would be obviously through bonds is one thing but also to focus on better planning. As I said before doing your progressive closure work, and I use progressive closure rather the progressive rehab because the rehab is just the icing on the cake at the end. For me it all comes back down to what the closure plans are that companies submit at the time of the original permits. So, if they've got very good process on progressive closure - and ranges from doing your technical studies, doing active in the field earth works, better planning then that puts everyone in a much better space. Otherwise reactive stuff isn't going to help anyone. That's what the bonds are for, to get people to actually begin on the rehabilitation.

What we'll be requiring from title holder is that every year what they do is they submit an annual rehabilitation report and forward program so what that report does is looks back on the last 12 months how's rehabilitation going is it on track to meet the rehab objectives and completion criteria are they effectively or progressively rehabbing and then what they do is also provide us a forward schedule so a 3 yearly schedule and effectively it's a rolling 3 yearly schedule so we hold them to account to that schedule on a yearly basis. So that's progressive rehab on the ground what monitoring are they going to be doing what studies are they going to be doing with the objective of meeting rehab in a timely fashion.... What effectively that does is that frees us up as regulators to actually get on the ground and see well what they're doing on site - it is effective - and we can utilise our range extra powers such as issuing notices for them to comply with to address particular aspects of rehab.

We'd also look at any other activities that would be carried out, this might be progressive rehabilitation for example, which is not uncommon. A mine goes into C&M phase it may well be that they can continue a progressive rehab program.

with the big mineral mines it's a bit hard to close down areas because there's generally only one pit and one or two waste rock dumps they're often till the end of the mine life still working on those pieces of infrastructure which are the highest risk pieces of infrastructure to close out particularly the waste rock dump and the tailings storage facility. I think the scope, in coal is a lot and aluminium what they need and sand mining, to actually do progressive rehabilitation is a lot higher than in the mineral sites that I generally deal with.
We’re working with financial consultants at the moment to basically do a corporate capability and risk assessment… that will be applied to all companies and out of that they will be given a risk category from low risk to high risk… depending what categorisation your put into the amount of financial assurance and how you pay financial assurance for you rehab costs is going to be calculated. The idea of the rehab costs, the mine gets close out according to a progressive rehab and closure plan. Part of the innovation we’re looking at it is to get companies to become more active with progressive rehabilitation. That does do two things - one it should decrease the footprint of companies down to minimum size at any particular time and therefore minimise the risks if it fails and the amount of work that may be required and secondly it makes companies think more carefully about what closure means to them and the timelines for closure and therefore provision better for it.

So then if a company goes into C&M basically what we’ll do is we’ll review the risk of that company and they may actually have to pay a financial assurance in a different category we’ll also chase them to still continue their progressive rehab. So, you can’t just sit around and do absolutely nothing.

We tend to use coercion to try and get the miner to do the rehabilitation themselves because it’s obviously cheaper for them to do it while they’ve got equipment on site and progressive rehabilitation is best done when it’s concurrently with the mining itself. But there is times when we’ve called on the bond where the mines gone bankrupt or for other reasons can’t do the rehabilitation and we use part or all of that bond to do that rehabilitation and that can often be done in a care and maintenance period.

When a site goes into C&M you lose access to the plant and equipment that was there before. That’s why we push for progressive rehabilitation concurrently with the mine operations because you’ve got the machinery there you’ve got the cash flow that the company has to reinvest into rehabilitation and it reduces the overall risk to the state and therefore the amount of bond the miner may have to hold if they rehabilitate as they go.

(Reviewing the PEPR on going into C&M) It can, but more often than not we continue with the existing environmental approvals. Because the PEPR has both operational controls, noise, dust, traffic, land access all those kinds of things as well as a closure plan - so all PEPRs are supposed to have a closure plan not all do but they’re all supposed to have closure plan and a progressive rehabilitation plan in there as well.

Both the community and the government have been a lot more proactive on sites in C&M you meet your environmental criteria but you don’t sit on them indefinitely, you either progressively rehabilitate and close or you look to re-open re-mine again. The length of mining tenure has reduced as well. So where we use to give 21 year mining leases to anyone who asks, now you often get a mine lease for 7, 4 or even 2 years if we think that you’re a high risk of not meeting your environmental obligations and often mining leases get cancelled if we think you’re not meeting your obligations under your PEPR or you’re not going to get back there and mine or whatever and we obviously hold a sufficient bond to get back and do the rehabilitation.

An interesting one would be, because it’s public knowledge as well is the Cliff’s iron ore mine in the mid-west in the Yilgarn - they were publicly saying that they didn’t have a whole heap of years of mine life left and they were doing some progressive rehabilitation on the site, they were doing quite well and then MRL stepped in and they’ve seen enough value in the remaining mining to keep mining and do the rehabilitation. That’s the longer-term issue in terms of if there are significant environmental risks, short term risks for a site in C&M they just get dealt with the same way whether the site is operating or not operating.

We’ve had 4 operations go into liquidation over the last two to three years… the circumstances leading up have been various. One of them is because the operation had a major disaster on its site and was closed down by government because there was ongoing concern about impacts. One was because it had been struggling for years and years and when we asked them for increased financial assurance, they decided that they would get out. Another one had come to the end of its mine life, it had been sitting there just waiting around maybe someone wanted to do some final mining of the remanence of the ore body and no one came along so in the end it had got to the point where the company ran out of resources and again claimed they’re already started mining if in a balancing act sometimes where everything’s got to be done in an environmentally sustainable manner and everything else and it’s got to get closed out in an environmentally sustainable manner but sometimes to achieve that end goal once they’ve already started mining if in a balancing act sometimes you need to allow a company to come in and give them the time and the ability to start operating to start making money to therefore be able to close it out or deal with any issues they’ve inherited so it’s that kind of balancing act of when is the carrot or the stick approach required for a company to make sure they close out and rehabilitate appropriately or more importantly that they’re progressively rehabilitating their site. That’s the longer-term issue. The shorter-term issue in terms of if there are significant environmental risks, short term risks for a site in C&M they just get dealt with the same way whether the site is operating or not operating.

We’ve got good closure guidelines now that say that it should be done progressively as far as possible and that you have to fund it properly. But 15-20 years ago, we didn’t have those no-one forced people to do it even though it was out there as leading practice you weren’t forced to do it, so people didn’t do it.

5.9 Predictability / measurable

Int. Predictability/ Measurability

Things like maybe geotechnical risks so as an example if you have a large pit even if you have a major wall failure and there’s a significant resource left you’ll probably still going to continue to mine because the economics suggest that even though it’s going to cost a lot to reactivate the pit you’re still going to do that. Versus if it’s a single operator, underground mine and a single shaft if you lose that shaft the mines done, you’re not going to start up again. So, should they have more proactive preliminary plans in place absolutely they should, and I don’t think the necessarily do.

We’ve had 4 operations go into liquidation over the last two to three years… the circumstances leading up have been various. One of them is because the operation had a major disaster on its site and was closed down by government because there was ongoing concern about impacts. One was because it had been struggling for years and years and when we asked them for increased financial assurance, they decided that they would get out. Another one had come to the end of its mine life, it had been sitting there just waiting around maybe someone wanted to do some final mining of the remanence of the ore body and no one came along so in the end it has got to the point where the company ran out of resources and again claimed they’re already started mining if in a balancing act sometimes where everything’s got to be done in an environmentally sustainable manner and everything else and it’s got to get closed out in an environmentally sustainable manner but sometimes to achieve that end goal once they’ve already started mining if in a balancing act sometimes you need to allow a company to come in and give them the time and the ability to start operating to start making money to therefore be able to close it out or deal with any issues they’ve inherited so it’s that kind of balancing act of when is the carrot or the stick approach required for a company to make sure they close out and rehabilitate appropriately or more importantly that they’re progressively rehabilitating their site. That’s the longer-term issue. The shorter-term issue in terms of if there are significant environmental risks, short term risks for a site in C&M they just get dealt with the same way whether the site is operating or not operating.

What we can do is amongst our-selves, between our agencies, talk about what we know about how companies are operating. For example, if a company starts to struggle it might start not to pay its annual lease rental fees, it might start not to pay council rates, things like. Or the environmental authority costs. That sort of thing. Or it might even from a safety and health concern it might start to get a little bit slack on the maintenance of the equipment and there could become a few safety issues relating to that - maybe there’s not enough staff on site to manage everything, those sort of things. hey are all tell-tale signs that we can collectively get together and give ourselves a heads up on.

We put the onus on the company if they’ve been in C&M for a time, why should we believe that you’re in C&M the onus is on you to show us that there is any resource left or there’s a good prospect of a resource rather than us.

Generally speaking, we know what resources are left in the mine sites in WA because they provide geologically reporting to us, they provide production reporting to us to royalties, we know what reserve was there when they got approved. Generally speaking, we’ve got information about the amount of commodity that’s still there so if we’ve got a site that’s coming right towards the end of its expected life of mine that’s when we’ll be monitoring it potentially closer.

In most cases there’s been some sort of a problem with the way that the mine was either operated or it hadn’t expanded sufficiently, or the processing circuit was obsolete and defunct and that may not have been why the company wasn’t going well.
### 5.10 Risk

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<th>Int.</th>
<th>High Risk - more monitoring/ inspections</th>
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<td>So we set a lot of outcome focused conditions as you probably realised we've gone down the outcome focused scenario so we basically said this is the outcome we want you need to manage your site we would put that on an inspection list we would perceive them to be higher risk so we would want them inspected more often and our compliance and we would look at them more closely because they're in C&amp;M and they are higher risk sites to us.</td>
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<td>We've got a regulatory strategy that says if you're higher risk we will come to your site more often so we would put them on a list that I could request that my mine compliance colleagues to actually go out there. And the person that's signs the orders works for me in terms of if we need to order issues.</td>
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<td>&quot;We're working with financial consultants at the moment to basically do a corporate capability and risk assessment... that will be applied to all companies and out of that they will be given a risk category from low risk to high risk... depending what categorisation your put into the amount of financial assurance and how you pay financial assurance for you rehab costs is going to be calculated. The idea of the rehab costs, the mine gets close out according to a progressive rehab and closure plan.&quot;</td>
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<td>So as part of our risk matrix and how we rank sites we think about things like; what's the status of the mine - are they in C&amp;M; how far away from expected planned closure are they - because if they're getting towards the end and they're exhausting all the mining that's really able to be done there they're basically exhausting the resource and if they become abandoned at that point in time and their not completing their closure that's when it's really high risk for us in terms of closure. Their closure planning needs to be in a final state they need to have demonstrated that they've really commenced rehabilitation works and we monitor really closely to make sure they actually close it out and rehabilitate it. So that's the riskier end if they fall away at that point in time and there's no resource left who's going to want to buy that, someone's got to rehabilitate it. We haven't had too many of those in recent times, where we've had to step in.&quot;</td>
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<td>We've got a range of sites that are risk ranked from very high to low, ok a lot of site are ranked in medium and low but there are... a certain percentage that are high or above and that's where we focus a lot of our time and resources, we don't completely disregard the rest but we definitely focus a lot of our time and resources there in that we'll do an annual audit of those sites it might be an inspection it might be more of a desk top style audit making sure all their reporting is up to date they're compliant with everything not having environmental impact and are actually planning for closure - we focus on those sites. Yes there is a cohort of them that span the state and different commodities and often it's to do with what the stage of mine life is, so they could well be quite a good operating company... if you're a company that operates well have always met all your obligations and you're getting up towards the end of closure and you're still demonstrating that you're actually progressively closing and rehabilitating things our and you're on track to meeting your closure plan you still won't come up as a really high risk for us, because you've really demonstrated that you're doing the right thing. It's more of you're getting to that stage and you've had hiccups along the way and you haven't really progressively rehabilitated that's when you often become a high risk; or during construction and operation if you're in a really sensitive area or you've had some compliance issues in the past that's when you tend to be a higher risk - so it's not just all about closure risk it's also about operational environmental risks, it's both.</td>
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Appendix 6A Fieldwork Safety Approval

4 July 2018

Alice Pepper
School of Veterinary and Life Sciences
Murdoch University

Dear Alice,

**RAMP No.** RAMP01067_05_18
**Project Title:** Policy and practice of mines in care and maintenance in Australia

FIELDWORK SAFETY

The fieldwork safety application related to this project has been reviewed by your School and has been:

Approved

This fieldwork safety application is valid for the duration of your RAMP form being 01/02/18 to 01/02/20.

Approval is granted on the understanding that the fieldwork will be conducted according to the approved protocol and applicable Occupational Health and Safety standards, and that your School fieldwork officer or School Office (VLSFieldwork@murdoch.edu.au), and your Primary Contact Person (as listed on your fieldwork safety form) will be provided with details of each trip and the individuals who will be going on the fieldwork.

Please quote your RAMP number in all correspondence.

Kind Regards,

Vanessa Hahn
Safety in Research and Teaching Coordinator
Tel +61 8 9360 6326
V.Hahn@murdoch.edu.au

Sarah Dias
Safety in Research and Teaching Administrative Assistant
Tel +61 8 9360 6506
S.dias@murdoch.edu.au
Monday, 09 July 2018

Dr Michael Hughes  
School of Veterinary & Life Sciences  
Murdoch University

Dear Michael,

Project No. 2018/110  
Project Title Policy and practice of mines in care and maintenance in Australia

Thank you for addressing the conditions placed on the above application to the Murdoch University Human Research Ethics Committee. On behalf of the Committee, I am pleased to advise the application now has:

OUTRIGHT APPROVAL

Approval is granted on the understanding that research will be conducted according to the standards of the National Statement on Ethical Conduct in Human Research (2007), the Australian Code for the Responsible Conduct of Research (2007) and Murdoch University policies at all times. You must also abide by the Human Research Ethics Committee’s standard conditions of approval (see attached). All reporting forms are available on the Research Ethics and Integrity web-site.

I wish you every success for your research.

Please quote your ethics project number in all correspondence.

Kind Regards,

Dr. Yvonne Haigh  
Chair  
HREC Committee

PP/ Dr. Erich von Dietze  
Manager  
Research Ethics and Integrity

cc: Dr Yvonne Haigh, Ms Mia (Alice) Pepper