

## BUILDING ORGANISATIONAL CAPACITY

# CHAPTER XIII

## COMPARATIVE ANALYSIS OF TAILINGS-RELATED LEGISLATION IN KEY MINING JURISDICTIONS

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### 1. INTRODUCTION AND METHODOLOGY

This chapter analyses tailings-related legislation in a selection of key mining jurisdictions: Australia (federal/Queensland), Brazil (federal/Minas Gerais), Canada (federal/Ontario), Chile, China, Ghana, Kazakhstan, Russia and South Africa ('Key Jurisdictions').<sup>1</sup> The results are based on a survey of issue-specific legislation in the Key Jurisdictions, carried out with the assistance of local counsel,<sup>2</sup> to compare the extent to which each of the fifteen principles in the proposed Global Industry Standard on Tailings Management (the 'Principles' and the 'Standard', respectively)<sup>3</sup> are addressed in each country's legislative framework.

**Table 1. Scoring Criteria**

Score	Scope of Legislation in Key Jurisdictions Compared with the Standard
1	'Not Addressed' (i.e. there is no applicable legislation addressing the Principle)
2	'Minimally Addressed' (i.e. the elements of the Principle are marginally or peripherally addressed in regulation)
3	'Partially Addressed' (i.e. most but not all elements of the Principle are addressed in the legislation, or all elements of the Principle are addressed but to a lesser standard)
4	'Comprehensively Addressed' (i.e. the elements of the Principle are addressed in legislation to about the same standard as the Standard)
5	'Higher Standard' (i.e. all elements of the Principle are addressed more comprehensively and/or more strictly in the legislation than the Standard)

1. The Key Jurisdictions were chosen to reflect a global cross-section of countries where mining is a significant sector of the economy and is predominantly regulated by State and/or Provincial governments.

2. See Acknowledgements.

3. In addition to the 15 Principles, the Standard also recommends 74 Requirements, which represent specific guidance on the operation and management of tailings facilities.

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The outcome of the analysis considers the scope of the Standard and its ambitions for technical and regulatory protocols to heighten requirements for tailings dam management, safety and accountability. A score, ranging from 1 to 5, was applied to rank the completeness and quality of legislation in the Key Jurisdictions relative to the treatment of issues raised in the Standard for each Principle. A description of the scoring criteria is provided in Table 1 below. Appendix 1 provides a breakdown of scores against the Principles for each Key Jurisdiction.

### 2. OVERVIEW OF FINDINGS

Figure 1 and Figure 2 represent the average score of each of the nine Key Jurisdictions for each of the fifteen Principles of the Standard. To have a clear representation of the averages and scores the countries have been split by southern and northern

hemisphere – five Key Jurisdictions are included in Figure 1 (Australia, Chile, South Africa, Ghana and Brazil) and four Key Jurisdictions are included in Figure 2 (Russia, China, Kazakhstan, Canada). The fifteen Principles of the Standard are listed in Table 2.

**Table 2. The fifteen Principles of the Standard**

Mine Tailings Standard Principles	
Principle 1	Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.
Principle 2	Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.
Principle 3	Use all elements of the knowledge base – social, environmental, local economic and technical – to inform decisions throughout the tailings facility lifecycle, including closure.
Principle 4	Develop plans and design criteria for the tailings facility to minimise risk for all phases of its lifecycle, including closure and post-closure.
Principle 5	Develop a robust design that integrates the knowledge base and minimises the risk of failure to people and the environment for all phases of the tailings facility lifecycle, including closure and post-closure.
Principle 6	Plan, build and operate the tailings facility to manage risk at all phases of the tailings facility lifecycle, including closure and post-closure
Principle 7	Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure
Principle 8	Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility
Principle 9	Appoint and empower an Engineer of Record
Principle 10	Establish and implement levels of review as part of a strong quality and risk management system for all phases of the tailings facility lifecycle, including closure
Principle 11	Develop an organisational culture that promotes learning, communication and early problem recognition
Principle 12	Establish a process for reporting and addressing concerns and implement whistleblower protections
Principle 13	Prepare for emergency response to tailings facility failures
Principle 14	Prepare for long term recovery in the event of catastrophic failure
Principle 15	Publicly disclose and provide access to information about the tailings facility to support public accountability

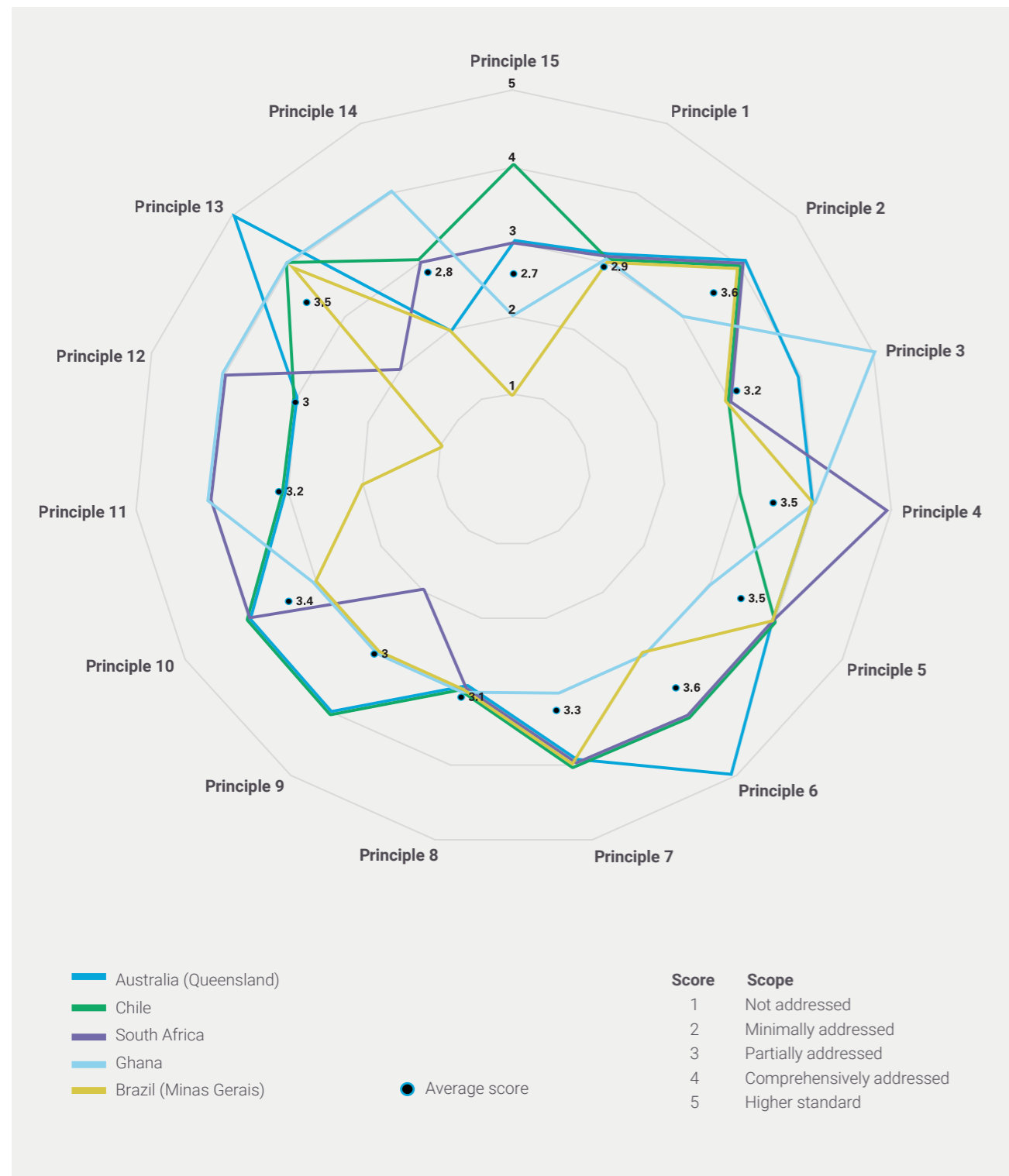


Figure 1. Scores against the Standard by Principle: Australia, Brazil, Chile, Ghana and South Africa

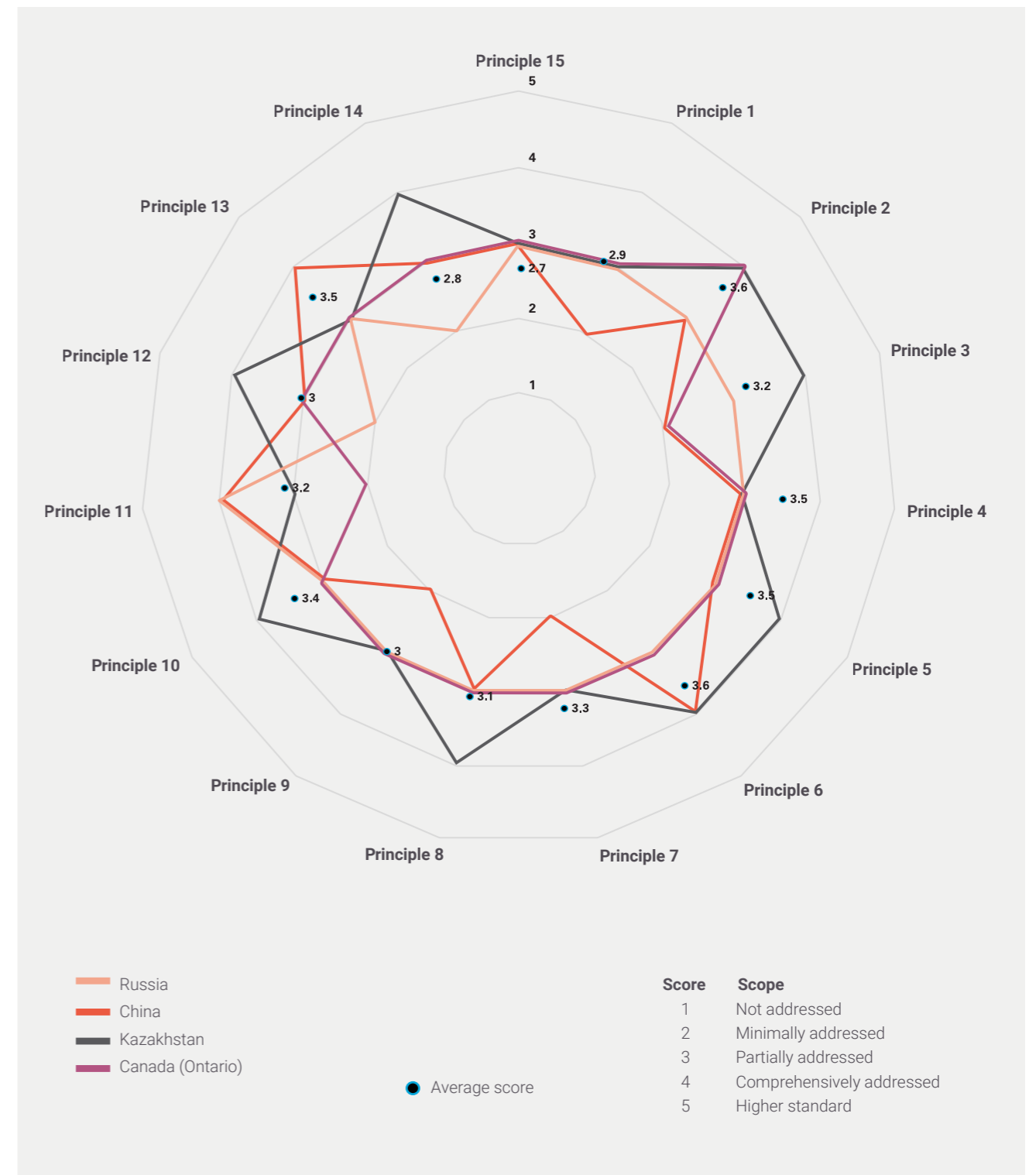


Figure 2. Scores against the Standard by Principle: Russia, China, Kazakhstan and Canada

### 3. FINDINGS BY PRINCIPLE

#### Topic I: Affected Communities

##### PRINCIPLE 1:

Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.

Principle 1 of the Standard recommends the inclusion of human rights principles in accordance with the United Nations Guiding Principles on Business and Human Rights (UNGPs). Some Key Jurisdictions have developed levels of community engagement

for project-affected people in the context of mining or environmental permitting processes, and the majority of Key Jurisdictions mandate engagement of potentially affected people. The concept of stakeholder engagement has complexities that are particular to each jurisdiction. For example, in Queensland, Australia (score 3), there is no formal requirement for free, prior and informed consent (FPIC), but there are requirements to consult or engage with potentially affected people and local communities, including at the exploration stage or where there may be an impact on cultural heritage. Although this includes grievance mechanisms and public disclosure of information, there is no legislation in place in Queensland, for example, that requires consultation in the closure phase. In Chile (score 3), Canada (score 3) and South Africa (score 3), there is no legislation applying the UNGPs; however, a process of consultation is carried out to address the impacts of a project on indigenous people or affected parties. In most of the Key Jurisdictions, it is unclear whether communities are engaged in all stages of the tailings facility lifecycle. Some aspects, such as resettlement, are not addressed in the context of tailings related legislation. The Requirements under the Standard establish a broader scope for engagement with communities and potentially affected people, and provide stringent guidelines for engaging communities that may be impacted by the operation or failure of tailings facilities.

#### Topic II: Knowledge Base

##### PRINCIPLE 2:

Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.

As part of the requirements of Principle 2, operators must develop and document knowledge throughout all stages of a tailings facility, from construction, operation and closure to post-closure. In a majority of the Key Jurisdictions (Canada,

Chile, South Africa, Kazakhstan, Ghana and Brazil), tailings-related legislation comprehensively addresses the development of a robust knowledge base. In Chile (score 4), operators are required to submit detailed information of different technical aspects of tailings facility operations to the Mining Authority (*Regulation on the Approval, Design, Construction, Operation and Closure of Tailings Dams, Supreme Decree No. 248, Mining Ministry 2007*). Similarly, in Canada (score 4) operators are required to develop a closure plan that includes technical details of mineral and tailings management, from construction to post closure (*Ontario Regulation 240/00 Mine Development and Closure under Part VII of the Mining Act 2019, Schedule 11*). In Australia (score 4), although the socio-economic and environmental aspects of tailings facility are typically addressed as part of the overall mine project impact assessment (*Environmental Protection Act 1994; the State Development and Public Works Organisation Act 1971*), there is no requirement to have a standalone document that just addresses the tailings facility. Other Key Jurisdictions, such as Russia (score 3) and China (score 3) have partially addressed elements of Principle 1 (*Federal Law No. 89-FZ on the Industrial and Consumption Wastes 1998 and Management Rules on Safety Supervision of Mine Tailings Dams 2009, respectively*), however, they do not have explicit documentation requirements. This may have a knock-on effect for impact management and performance improvement. Overall, the model proposed in the Standard provides for a broader stock of knowledge as compared to existing regulations in Key Jurisdictions, especially in its requirement to develop and document lifecycle information for tailings facilities.

##### PRINCIPLE 3:

Use all elements of the knowledge base – social, environmental, local economic and technical – to inform decisions throughout the tailings facility lifecycle, including closure.

Principle 3 focuses on how operators review and update impact assessments to reflect significant changes to the social and environmental context, and assessing best available technologies to update any new information relevant to the operation and maintenance of the

tailings facility.<sup>4</sup> It is noteworthy that regulatory requirements in Ghana (score 5) set a higher standard than described in this Principle. The Environmental Assessment Regulations include assessment and consideration of climate change issues in the context of site selection and the development of impact mitigation plans for the environmental impact assessment ('EIA') (*Environmental Assessment Regulations 1999, Regulation 12 and Regulation 22*). Most of the remaining Key Jurisdictions only partially address the requirements of Principle 2. In Chile (score 3), China (score 3) and Brazil (score 3) there are requirements for minimising risk of tailings facility failures, but climate change considerations are not included in the evaluation of environmental impacts. However, for Brazil there is a National Policy on Climate Change, which foresees as one of its general guidelines 'adaptation measures to reduce the adverse effects of climate change and the vulnerability of environmental, social and economic systems' (*Federal Law No. 12,187/2009 2009*). In South Africa (score 3), the courts have determined that notwithstanding the lack of an express legal obligation to conduct a focused climate change impact assessment, climate change remains a relevant element to consider when granting an environmental authorisation. In this way, through the addition of technology-based factors, the Standard is setting a higher benchmark than in most of the Key Jurisdictions.

#### Topic III: Design, Construction, Operation and Monitoring of the Tailings Facility

##### PRINCIPLE 4:

Develop plans and design criteria for the tailings facility to minimise risk for all phases of its lifecycle, including closure and post-closure.

Legislation in all of the Key Jurisdictions address risk mitigation in the construction and management of tailings facilities. Ghana (score 4) and Brazil (score 4) comprehensively address the elements of Principle 4, similar to the Standard.

However, South Africa (score 5) is noteworthy in its application of more extensive measures and therefore a higher standard than the one proposed. Applicable legislation in South Africa requires an assessment of the nature of the mine residue stockpiles to consider whether these could pose a potentially significant health and safety or environmental risk (*Mineral and Petroleum Resources Development Act 2002*). As there is no requirement under the Standard to consider the physical or chemical characteristic of mine residue, the legislation in South Africa sets a bar higher than the Standard. The other Key Jurisdictions do not achieve the aspirations of the Standard in this regard. For example, Russia (score 3) does not appear to consider design criteria as an element of risk management. However, there are no requirements for a review by an Independent Tailings Review Board ('ITRB') or requirements for a risk or consequence matrix for tailing facilities, even where there are multiple requirements for the safe design of tailings facilities. Therefore, the caliber of technical requirements under this Principle, for the most part, adds another dimension to the quality of construction and risk minimization that is higher than current regulatory requirements in the Key Jurisdictions.

4. Global Industry Standard on Tailings Management, Requirement 2.4 [Commentary].



**PRINCIPLE 5:**

Develop a robust design that integrates the knowledge base and minimises the risk of failure to people and the environment for all phases of the tailings facility lifecycle, including closure and post-closure.

According to the Standard, integration of a knowledge base to minimise risks of failure during the lifecycle of a tailings facility is fundamental for monitoring risk and maintaining the integrity of the facility. Australia (score 4), Chile (score 4) and Brazil (score 4) have comprehensively addressed measures to design and minimize the

risk of tailings facilities failures. Australian legislation also addresses water management, along with Kazakhstan (score 4) and Ghana (score 3). This is an important aspect of tailings management.<sup>5</sup> In China (score 3), many elements of Principle 5 are addressed but they appear to be addressed to a lesser degree or scope than the Standard. In Canada (score 3), there is no specific requirement to develop, implement and maintain water balance and water management plans for tailings facilities, but the legislation does reference technical documents, design, construction and decommissioning requirements that proponents must meet. The Standard sets a high threshold for factors such as facility failure as part of lifecycle risk assessment, including the impact of water management. However, based on information from most of the Key Jurisdictions, the Requirements of this Principle go beyond what is currently identified in their various legislation.

**PRINCIPLE 6:**

Plan, build and operate the tailings facility to manage risk at all phases of the tailings facility lifecycle, including closure and post-closure.

Principle 6 reflects the fact that a tailings facility is most likely situated within a complex and dynamic local and global environment.<sup>6</sup> To handle such complexity, many Key Jurisdictions have developed sophisticated

monitoring mechanisms and requirements to manage risk at all stages of the facility lifecycle, such as certification of design plans and drawings, periodic reports to the authorities, engagement with independent experts, among others. Legislation in Australia (score 5), is developed to a high standard for managing risks in all stages of planning, building and operating the tailings facility. Legislation in Chile (score 4), South Africa (score 4), China (score 4) and Kazakhstan (score 4) comprehensively addresses the requirements of Principle 6. Other Key Jurisdictions only meet certain aspects of Principle 6, such as Ghana (score 2), where the requirement for an operator to update quality control plans and verification of the design criteria only applies before commencing construction and not during construction of the tailings facilities. The Standard appears to be aligned with good industry practice in most of the Key Jurisdictions, but some of the Requirements set out additional measures, such as monitoring at all stages of the facility lifecycle.

**PRINCIPLE 7:**

Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.

The intention behind Principle 7 is to encourage the establishment of a system of internal assurance, by regularly reviewing the performance of the tailings facility.<sup>7</sup> All of the Key Jurisdictions

have developed basic regulations to monitor and control tailings facilities. However, only Australia (score 4), Chile (score 4), South Africa (score 4) and Brazil (score 4) comprehensively address the elements set out by the Standard. For example, in South Africa, an audit report must be provided to assess the level of compliance with the conditions of the environmental authorisation. The report must also be published online by the holder of the environmental authorisation (*Environmental Impact Assessment Regulations* 2014, Regulation 35(6)). Neither Australia, China, Kazakhstan, Ghana nor Canada, establish any obligation to publish results of the monitoring programme on a regular basis, as set out in the Requirements of this Principle. The requirement for regular publication of the results of the monitoring programmes is an enhanced condition included in

7. Requirement 7.1 Commentary: 'The intention of this requirement is to set up performance monitoring of the key management systems (TMS and ESMS) as an additional level of internal assurance. In order to reduce the potential for information not being shared and not informing decisions across both systems, the requirement is for an integrated monitoring programme for those aspects of the ESMS that are related to safety of the tailings facility.'

5. Requirement 5.3: 'Develop, implement and maintain a water balance and water management plans for the tailings facility, taking into account the knowledge base including climate change, upstream and downstream hydrological basins, the overall mine site, mine planning and operations and the integrity of the tailings facility for all stages of its lifecycle. The water management program must be designed to protect against unintentional releases.'

6. Requirement 6.1: 'Build, operate, monitor and close the tailings facility according to the design intent at all stages of the tailings facility lifecycle, using qualified personnel and appropriate methodology, equipment, procedures, data acquisition methods, the TMS and the overall environmental and social management system (ESMS) for the mine and associated infrastructure.'

the Standard compared with the Key Jurisdictions. Considering the importance of transparency and inclusion in understanding and addressing risks of tailings facility failures, including for stakeholder engagement, this is an essential element for improvement.

**Topic IV: Management and Governance****PRINCIPLE 8:**

Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility.

Most tailings-related legislation does not comprehensively address the management roles, functions, accountability and remuneration systems of a tailings facility. In general, these elements are addressed

under other areas of law. Most Key Jurisdictions cover the liability of directors in cases of damages to the tailings facility, rather than addressing roles and functions. Chile (score 3) and Kazakhstan (score 4) are the only two countries where legislative requirements are included in mine tailings legislation. In Chile, the legislation is aligned with Principle 8 as it requires operators to develop internal regulations to ensure the integrity of workers, facilities, equipment and the environment (*Mining Safety Regulation, Supreme Decree No. 132 2004*). In Kazakhstan, there are requirements to appoint roles and functions at each facility for conducting industrial environmental control and for interaction with regulatory authorities (*Environmental Code 2007*). Legislation in Kazakhstan also sets out provisions for environmental crimes and for failure of directors to comply with environmental requirements (*Administrative Violations Code* and *Penal Code of Kazakhstan*). Many of the other Key Jurisdictions do address accountability and liability but this is in the context of other legislation, such as company law or to a lesser degree. For example, in Australia (score 3) regulations exist establishing roles, functions and remuneration systems to support the integrity of the tailings facility, but the *Environmental Protection Act 1994* governs compliance with the conditions set out by the environmental authority and non-compliance can lead to criminal liability of directors. The Requirements of Principle 8 develop a variety of specific elements related to accountability and for the most part none of the Key Jurisdictions has comprehensively addressed the Principle. Therefore, the Standard establishes a new standalone mechanism for accountability for tailings facility management and compliance.

**PRINCIPLE 9:**

Appoint and empower an Engineer of Record.

Regulations in the majority of the Key Jurisdictions, including South Africa (score 2), Russia (score 3), China (score 2), Kazakhstan

(score 3), Ghana (score 3), Brazil (score 3) and Canada (score 3), do not have a specific requirement to appoint and empower an Engineer of Record, as set out in Principle 9 of the Standard. Instead, these countries require for project designers and workers to have necessary professional and technical qualifications. Only Australia (score 4) requires that, on completion of construction, the engineer of record who supervises the construction of the regulated tailings facility must provide certification to the administering authority in the form required by the Assessment Manual. Chile (score 4) comprehensively addresses this Principle by setting out requirements for the engagement of an independent engineer. Therefore, the Standard adds a requirement designed to address the integrity of tailings facilities, as well as independent review and accountability for tailings facility design, development, construction, management and compliance.

**PRINCIPLE 10:**

Establish and implement levels of review as part of a strong quality and risk management system for all phases of the tailings facility lifecycle, including closure.

The majority of Key Jurisdictions – Australia (score 4), Chile (score 4), South Africa (score 4), China (score 3), Kazakhstan (score 4), Ghana (score 3) and Canada (score 3) require some level of adequate financial capacity to cover the reclamation, closure and post-closure costs included

in Principle 10. In Australia, mining activities, including tailings dams, must be rehabilitated in accordance with an approved Progressive Rehabilitation and Closure Plan, including the requirement for payment or a surety to cover for the rehabilitation (reviewed annually).<sup>8</sup> The size of the surety can be increased if the risk rating or cost estimate goes up, or reduced if the risk rating or cost estimate reduces. Risk management systems for all stages of the tailings facility lifecycle have also been developed by Chile and these allow for a wide variety of instruments to be used to meet adequate financial capacity obligations,

8. Requirement 15.1.B.10 requires 'Annual confirmation that the Operator has adequate financial capacity (including insurance to the extent commercially reasonable) to cover estimated costs of planned closure, early closure, reclamation, and post-closure of the tailings facility and its appurtenant structures (Requirement 10.7).'

including cash, letters of credit, bond, trusts and insurance policies. The Requirements of Principle 10 are addressed to some degree in all of the Key Jurisdictions, although none of them exceeds the Standard.

#### PRINCIPLE 11:

Develop an organisational culture that promotes learning, communication and early problem recognition.

South Africa (score 4), China (score 4) and Ghana (score 4) have developed regulations that comprehensively address elements of Principle 11 similarly to the Standard. They have not only established mechanisms to

promote learning into the planning, design and operations of the tailings facility lifecycle, but regulations in these countries have also focused on protecting employees and contractors who speak out about issues in relation to the facility management.<sup>9</sup> For instance, in South Africa whistle-blowers are protected from civil and criminal liability and from being dismissed for having provided information related to an environmental risk (*Code of Practice for Mine Residue* 1998). Whistle-blowers also have some level of protection under Canadian law, but it is limited to violations of certain statutes. The Requirements of this Principle to provide education and training of relevant personnel in safety operation and risk prevention exist in most of the Key Jurisdictions, but for the most part to a lesser extent than the Standard.

#### PRINCIPLE 12:

Establish a process for reporting and addressing concerns and implement whistle-blower protections.

Principle 12 encourages the establishment of an internal, confidential process to investigate and address concerns in relation to the tailings facility, such as violations of permit conditions. Kazakhstan (score

4) sets an example of a Key Jurisdiction which has established an internal mechanism to encourage parties to raise concerns about possible permit violations. Its legislation sets out the requirement for an employee to respond immediately to violations of environmental requirements, or in the case of any danger to human life and health (*Environmental Code*

2007). Ghanaian legislation<sup>10</sup> (score 4) also provides measures for whistle-blower protection (*Minerals and Mining (Health, Safety and Technical) Regulations* 2012). Although most of the Key Jurisdictions require authorities to conduct investigations about possible failures relating to tailings facilities, there is room for improvement in developing and implementing internal mechanisms to investigate.

#### Topic V: Emergency Response and Long-Term Recovery

##### PRINCIPLE 13:

Prepare for emergency response to tailings facility failures.

Emergency response plans have been developed by most Key Jurisdictions, and in many cases they are required as part of the environmental

and social impact assessment and/or permitting process. However, most of the Key Jurisdictions do not include in tailings-related legislation a specific reference or guidance for best practice. Australia (score 5) stands apart from other Key Jurisdictions as there is multiple legislation and guidance to address responses to tailings facility failures. This goes beyond the current recommendations of the Standard. On the other hand, in South Africa (score 2), there is no specific requirement to prepare emergency responses in cases of tailings dam failures. In Russia (score 3), an owner or operator must develop and submit for the state approval various documents relating to safety of the operated facilities. Having a tailings-specific requirement for emergency response and preparedness is a requirement of the Standard that is not currently consistently applied in the Key Jurisdictions.

##### PRINCIPLE 14:

Prepare for long term recovery in the event of catastrophic failure.

The Standard proposes a new metric for long-term recovery in the event of catastrophic failure. Ghana (score 4) and Kazakhstan (score 4) set out

comprehensive rules and procedures on remediation, reclamation and post-failure response. In Chile (score 3) notwithstanding there are no specific requirements to develop high-level principles describing how the parties will approach compensation, remediation and recovery in case of a catastrophic failure, there are several mechanisms by which the public agencies may engage in the control, investigation

9. This is set out in Requirement 11.5: 'Establish mechanisms that recognize, reward and protect from retaliation, employees and contractors who speak up about problems or identify opportunities for improving facility management. Respond in a timely manner and communicate actions taken and their outcomes.'

10. Grievance mechanisms are covered in the *Whistleblower Act 2006* and the *Health, Safety and Technical Regulations 2012*.

and sanction of mining emergencies or catastrophes, as well as measures to be adopted by the operators. However, some Key Jurisdictions such as Australia (score 2) and Brazil (score 2) have no specific guidelines in relation to post-failure response. Most Key Jurisdictions have not established statutory or regulatory rules on the mechanisms to engage or compensate affected people, post-failure of tailings facilities. Overall, the Standard proposes a more robust regime for recovery in the context of catastrophic failure.

#### Topic VI: Public Disclosure and Access to Information

##### PRINCIPLE 15:

Publicly disclose and provide access to information about the tailings facility to support public accountability.

Some Key Jurisdictions, including Chile (score 4), Canada (score 3) and South Africa (score 3), have specific statutes that govern access to public information. For example, in Ontario, the *Freedom of Information and Protection of*

*Privacy Act 2000* gives individuals the right to request access to government-held information. A similar provision can be found in the *Chilean 'Transparency Act' (Law No. 20,285 on Access to Public Information)*. However, these regulations do not provide for an automatic public access to information on tailings facility decisions, as contemplated by Principle 15. In this way, the Standard shifts focus on to the need for access to information by local authorities, individuals and communities that may be affected by tailings facilities, emphasising the need for transparency. At the same time, the Standard accommodates the protection of confidential information, balancing the needs of all parties.

#### 4. SUMMARY OF FINDINGS

As a general observation, it is clear that although many of the Principles are well-reflected in the laws and regulations of some of the Key Jurisdictions, the ambitions of the Standard, when compared to domestic law, set a higher threshold for achieving the degree of integrity, safety and community protection necessary for the development and management of tailings facilities. This research has identified certain areas where the Standards sets a higher bar than legislation in Key Jurisdictions, which could provide the impetus for regulators to consider where changes could be made to address tailings facility safety and management.

The overall results of the analysis of tailings safety legislation in the Key Jurisdictions, expressed as average scores (see Appendix 1) e, show how the Standard can be a catalyst for improvement in regulation of tailings facilities. The analysis brings to the fore both the scope and need for a consistent approach to tailings facility management, safety and operation.

The gap between the most and least aligned Key Jurisdictions draws out the need for more emphasis on catastrophic failure, accountability and engagement of communities as the starting point of tailings dams regulation. Working backward from a worst case scenario informs the approach to permitting, approvals and enforcement from the beginning, which in turn sets the tone for iteration and improvement.

A final observation is that, while legislation is an essential tool for regulating tailings facility safety and management throughout the lifecycle, other forms of best practice exist and jurisprudence are also developing, both of which may also be effective in helping to achieve the goals of the Standard.

## APPENDIX 1 – SUMMARY OF SCORES AGAINST THE STANDARD BY KEY JURISDICTION

Principle	Australia (Queensland)	Chile	South Africa	Russia	China	Kazakhstan	Ghana	Brazil (Minas Gerais)	Canada (Ontario)	Average Score
Principle 1: Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.	3	3	3	3	2	3	3	3	3	2.9
Principle 2: Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.	4	4	4	3	3	4	3	4	4	3.7
Principle 3: Use all elements of the knowledge base – social, environmental, local economic and technical – to inform decisions throughout the tailings facility lifecycle, including closure.	4	3	3	3	3	4	5	3	2	3.3
Principle 4: Develop plans and design criteria for the tailings facility to minimise risk for all phases of its lifecycle, including closure and post-closure.	4	3	5	3	3	3	4	4	3	3.5
Principle 5: Develop a robust design that integrates the knowledge base and minimises the risk of failure to people and the environment for all phases of the tailings facility lifecycle, including closure and post-closure.	4	4	4	3	3	4	3	4	3	3.5
Principle 6: Plan, build and operate the tailings facility to manage risk at all phases of the tailings facility lifecycle, including closure and post-closure.	5	4	4	3	4	4	3	3	3	3.7
Principle 7: Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.	4	4	4	3	2	3	3	4	3	3.3
Principle 8: Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility.	3	3	3	3	3	4	3	3	3	3.1
Principle 9: Appoint and empower an Engineer of Record.	4	4	2	3	2	3	3	3	3	3
Principle 10: Establish and implement levels of review as part of a strong quality and risk management system for all phases of the tailings facility lifecycle, including closure.	4	4	4	3	3	4	3	3	3	3.4
Principle 11: Develop an organisational culture that promotes learning, communication and early problem recognition.	3	3	4	4	4	3	4	2	2	3.2
Principle 12: Establish a process for reporting and addressing concerns and implement whistleblower protections.	3	3	4	2	3	4	4	1	3	3
Principle 13: Prepare for emergency response to tailings facility failures.	5	4	2	3	4	3	4	4	3	3.5
Principle 14: Prepare for long term recovery in the event of catastrophic failure.	2	3	3	2	3	4	4	2	3	2.9
Principle 15: Publicly disclose and provide access to information about the tailings facility to support public accountability.	3	4	3	3	3	3	2	1	3	2.8
<b>Total Score for Each KMJ</b>	<b>55</b>	<b>53</b>	<b>52</b>	<b>44</b>	<b>45</b>	<b>53</b>	<b>51</b>	<b>44</b>	<b>44</b>	<b>49*</b>

\*Average total score for KMJ

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## SOURCES

**Australia (federal/Queensland)**

*Aboriginal Cultural Heritage Act 1988*

*Aboriginal Land Rights Act*

*Australian National Committee on Large Dams, Guidelines on Tailings Dams 2019 (ANCOLD Guidelines)*

*Code of Environmental Compliance for Environmental Authorities for High Hazard Dams Containing Hazardous Waste – EM1698 (High Hazard Dam Code)*

*Coal Mining Safety and Health Act 1999 (CMSH Act)*

*Coal Mining Safety and Health Regulation 2017*

*Environmental Protection Act 1994*

*Environmental Protection Regulations 2019*

*Guideline ESR/2016/1934 on 'Structures which are Dams or Levees Constructed as part of Environmentally Relevant Activities' (ERA Guideline)*

*Guidance Note QGN 29 on 'Surface Tailing Storage Facility Management' 2018 (QGN29)*

*Manual ESR/2016/1933 for 'Assessing Consequence Categories and Hydraulic Performance of Structures' (Assessment Manual)*

*Mineral and Energy Resources (Financial Provisioning) Act 2018 (Queensland)*

*Mining and Quarry Safety and Health Act 1999*

*Mining and Quarry Safety and Health Regulation 2017*

*Mineral Resources Act 1989 (Queensland)*

*Planning Act 2016*

*Professional Engineers Act 2002*

*State Development and Public Works Organisation Act 1971 (Queensland)*

*Water (Safety and Reliability) Act 2008*

**Brazil (federal/Minas Gerais)**

*Competent Council Joint Resolution No. 2.372/2016*

*Council for Environmental Policy (COPAM) Deliberation no. 87/2005*

*Council for Environmental Policy (COPAM) Normative Deliberations Nos. 62/2002, 87/2005, 124/2008.*

*National Department of Mineral Production (DNPM) Ordinance No. 70,389/2017*

*National Policy on Dam Safety (Federal Law No. 12,334/2010)*

*National Policy on Climate Change (Federal Law No. 12,187/2009)*

*Resolution No. 01/1986 of the National Council for the Environment*

*State Decree No. 46,993/2016*

*State Law No. 23,291/2019*

*State Law No. 21.291/2019*

*State Law No. 6.496 of 7 December 1977*

*State Law No. 12,187 of 29 December 2009*

*State Secretariat of Environmental Development (SEMAD) and State Environment Foundation (FEAM) Joint Resolution No. 2.372/2016*

*The National Council of the Environment (CONAMA) Resolution No. 09/1987*

*The National Council of the Environment (CONAMA Resolution No. 237/1997*



**Canada (Federal/Ontario)**

Endangered Species Act 2007  
 Environmental Assessment Act 2012  
 Environmental Bill of Rights 1993  
 Environmental Protection Act 1999  
 Freedom of Information and Protection of Privacy Act 2000  
 Mineral and Petroleum Resources Development Regulations 2004  
 Mining Act 1990 (Ontario)  
 Occupational Health and Safety Act 1990  
 Ontario Regulation 240/00, Mine Development and Closure of the Mining Act 2019  
 Ontario Water Resources Act 1990

**Chile**

Law No. 20,555 the Mining Sites and Facilities Closure Act and its regulation (the 'MCA')  
 Law No. 19,300, the General Environmental Act and its regulation (the 'GEA')  
 Mining Safety Regulation, Supreme Decree No. 132/2004 2004  
 Regulation on the Approval, Design, Construction, Operation and Closure of Tailings Dams, Supreme Decree No. 248/2007 2007  
 Supreme Decree No. 132 of the Mining Ministry 2004, Mining Safety Regulation (the 'MSR')  
 Transparency Act Law No. 20,285 on Access to Public Information 2009

**China**

Code for Design of Tailings Facilities (or '尾矿设施设计规范') (GB 50863-2013), issued jointly by Ministry of Housing and Urban-Rural Development (or '中华人民共和国住房和城乡建设部') and General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China on 8 June 2013  
 Law of the People's Republic of China on Environmental Impact Assessment (or '中华人民共和国环境影响评价法'), last revised by the Standing Committee of the National People's Congress on 29 December 2018  
 Law of the People's Republic of China on Preventing Environmental Pollution by Solid Waste (or '中华人民共和国固体废物污染环境防治法'), issued by the Standing Committee of National People's Congress on 7 November 2016  
 Management Rules on Preventing Environmental Pollution by Mine Tailings (or '防治尾矿污染环境管理规定'), last revised by Ministry of Ecology and Environment on 22 December 2010  
 Management Rules on Safety Supervision of Mine Tailings Dam (or '尾矿库安全监督管理规定'), issued by Ministry of Emergency Management (or '应急管理部') on 20 December 2019  
 Mine Safety Law of the People's Republic of China (or '中华人民共和国矿山安全法'), last revised by the Standing Committee of the National People's Congress on 27 August 2009  
 Provisional Guidance on Emergency Management of Mine Tailings Dam Environment (or '尾矿库环境应急管理指南(试行)'), issued by Ministry of Ecology and Environment (or '生态环境部') (formerly Ministry of Environmental Protection) on 30 September 2010  
 Provisional Rules on the Supervision and Management of Mine Tailings Dam by Gansu Province (or '甘肃省尾矿库监督管理试行办法'), issued by the Provincial Government of Gansu on 1 January 2018

Regulations for the Implementation of the Mine Safety Law of the People's Republic of China (or '中华人民共和国矿山安全法实施条例'), issued by Ministry of Labour & Social Security (now dissolved) on 30 October 1996  
 Safety Regulations for Tailings Pond (Draft Subject to Public Comments) (or '尾矿库安全规程(征求意见稿)'), issued jointly by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (or '中华人民共和国国家质量监督检验检疫总局') and the Standardization Administration (or '中国国家标准化管理委员会') on 2 September 2019

**Ghana**

Commission on Human Rights and Administrative Justice Act 1993  
 Environmental Assessment Regulations 1999  
 Environmental Protection Agency (EPA) Grievance Redress Mechanism Operational Manual 2016

Local Government Act 1993 (Act 462)  
 Minerals and Mining (Compensation and Resettlement) Regulations 2012  
 Minerals and Mining (Health, Safety and Technical) Regulations 2012  
 National Building Regulations 1996 (LI 1630)  
 The Companies Act 2019  
 Whistleblower Act 2006 (Act 720)

**Kazakhstan**

Administrative Infractions Code of the Republic of Kazakhstan dated 5 July 2014 No. 235-V, as amended  
 Environmental Code of the Republic of Kazakhstan dated 9 January 2007 No.212, as amended  
 Law No.401-V of the Republic of Kazakhstan 'On Access to Information' dated 16 November 2015, as amended  
 Law No. 242 of the Republic of Kazakhstan 'On Architectural, Town-planning and Construction Activity in the Republic of Kazakhstan' dated 16 July 2001, as amended  
 Penal Code of the Republic of Kazakhstan dated 3 July 2014 No. 226-V, as amended  
 Public Hearings Rules, approved by the Order of the Ministry of Environmental Protection dated 7 May 2007 No.135-n, as amended  
 Rules of Formation of Reclamation Funds for Landfills, approved by the Order No. 125 of the Minister of Energy of the Republic of Kazakhstan dated 13 November 2014, as amended  
 The Rules on Industrial Safety for Tailings and Tailings Management Facilities on Hazardous Production Sites, approved by the Order No. 349 of the Minister for Investment and Development dated 30 December 2014, as amended

**Russia**

Decree of the Federal Mining and Industrial Supervision Authority of Russia No. 6 'On the Approval of the Rules of Safety of Hydrotechnical Constructions Storing Liquid Industrial Wastes' dated 28 January 2002  
 Decree of the Government of the Russian Federation No. 20 'On the Engineering Survey for the Preparation of Design Documentation, Construction, Reconstruction of Capital Construction Facilities' dated 19 January 2006, as amended  
 Decree of the Government of the Russian Federation No. 145 'On the Procedure for Organization and Holding of the State Expert Review of Design Documentation and Results of Engineering Surveys' dated 05 March 200, as amended  
 Federal Law No. 89-FZ 'On the Industrial and Consumption Wastes' dated 24 June 1998, as amended  
 Federal Law No. 117-FZ 'On the Safety of Hydrotechnical Constructions' dated 21 July 1997, as amended  
 The Town-Planning Code of the Russian Federation (Federal Law No. 190-FZ) dated 29 December 2004, as amended

**South Africa**

Code of Practice for Mine Residue 1998 ('SABS Code 0286')  
 Constitution of the Republic of South Africa 1996  
 Department of Mineral Resources and Energy (DMRE), 'Guidelines Document for the Evaluation of the Quantum of Closure-related Financial Provision Provided by a Mine' 2005  
 Environmental Impact Assessment Regulations 2014  
 Guidelines on Water Management for Mine Residue Deposits prepared by the Department of Water and Forestry  
 Income Tax Act No. 58 1962  
 Mineral and Petroleum Resources Development Act 2002  
 Minister of Environmental Affairs, 'Financial Provision Regulations' 2015  
 National Environmental Management Act 1998  
 National Environmental Management Waste Act 2008  
 National Water Act 1998