

Independent Monitor
McArthur River Mine

Annual Report Card 2021

Independent monitoring and reporting on data from 1 May 2020 to 30 April 2021



Advisian
Worley Group

The Independent Monitor

The Independent Monitor is an expert hired by the Northern Territory (NT) government to do a check (or an 'audit') to find out how well the McArthur River Mine is looking after the environment. The last audit was done in 2020 and now the Independent Monitor has finished the audit for 2021. The 2021 audit covered the time between 1 May 2020 and 30 April 2021. During the audit the Independent Monitor checked:

- McArthur River Mining (the Mine Operator) to see if the way they run the mine meets the rules put on them by the government to protect the environment
- The government (NT Department of Industry, Tourism and Trade (DITT), or 'the Department') to find out how good they are at making sure the mine is following the rules

The outcomes of the audit were written into a report called the Annual Environmental Performance Audit Report (AEPAR) 2021. This Annual Report Card is a summary of the main findings of the AEPAR 2021.

The Independent Monitor did an audit to check:

How well McArthur River Mining and the government met the rules (called conditions) that are listed in McArthur River Mining's:

- **Mining Authorisation (approval)**
- **Waste Discharge Licence.**

The Independent Monitor also looked at other things that help guide the environmental management of the mine, including:

- Recommendations made by the Northern Territory Environment Protection Authority (called the NT EPA Recommendations)
- McArthur River Mining's voluntary environmental commitments
- The Department's approach to applying the environmental rules to the mine
- The health of the McArthur River near and downstream of the mine.

During the audit the Independent Monitor got information in a couple of ways:

By looking at the documents that describe the ways that McArthur River Mining and the government are managing things.

For example, for the mine this was things like air quality monitoring information, and for the government this was things like a report that says what actions the government took if they found that the mine wasn't following the rules properly.

By asking people that work at the mine and the government questions about the mine's activities.

This included interviews and video phone calls.



For illustrative purposes only (not to scale)

Key
Mining Lease Area
Haul route

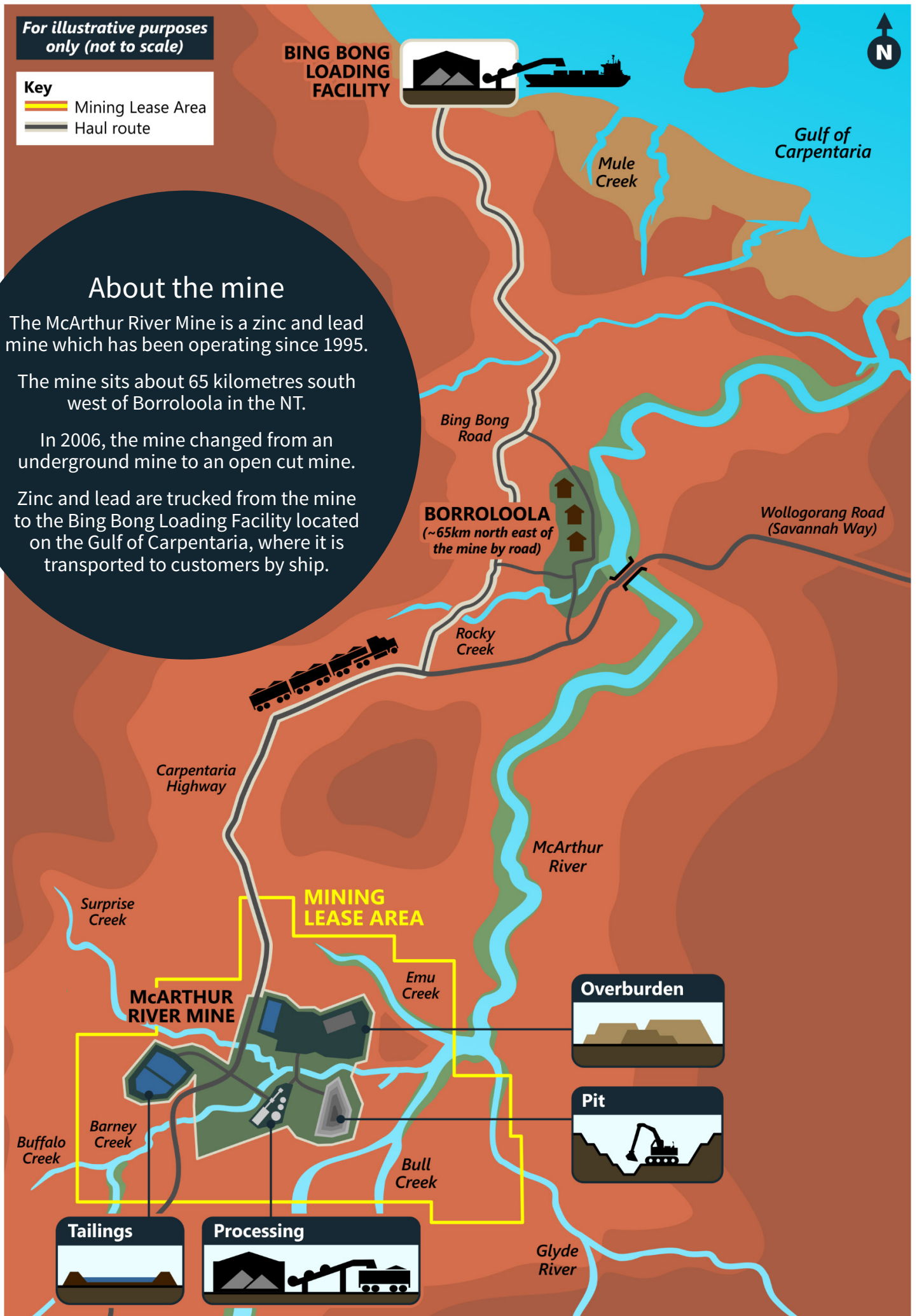
About the mine

The McArthur River Mine is a zinc and lead mine which has been operating since 1995.

The mine sits about 65 kilometres south west of Borroloola in the NT.

In 2006, the mine changed from an underground mine to an open cut mine.

Zinc and lead are trucked from the mine to the Bing Bong Loading Facility located on the Gulf of Carpentaria, where it is transported to customers by ship.





How are the findings measured?

To check how well McArthur River Mining was following the rules (conditions) of the Mining Authorisation and Waste Discharge Licence, and NT EPA recommendations, the Independent Monitor used a scoring system with a scale of 0 to 4 to score how well the rules were followed:



A score was given to each condition and recommendation reflecting how well the rules were followed, and then the scores were added up and overall percentages (%) were worked out.

The Independent Monitor also looked at:

- McArthur River Mine's environmental commitments
- The Department's approach to applying environmental rules to the mine
- Overall health of the McArthur River.

The Independent Monitor did not score these other things that they looked at, but they did consider how well these things had been done.

Community consultation on last year's audit

In 2020 and 2021, the Independent Monitor spoke to people who live in Borroloola to explain what the Independent Monitor does and to give the results of the 2020 audit. Below provides an overview of the community consultation:

How were people consulted?

Face-to-face conversations

Conversations were held in November 2020 and May 2021.

Annual Report Card

People were given a copy of the Annual Report Card 2020 in May 2021.

What was talked about?

Engagement focused on the following main points regarding the Independent Monitor's role and the AEPAR findings:

- General findings of the AEPAR
- The health of the McArthur River, and its fish and mussels
- The use of the summarised Annual Report Card to present the findings of the AEPAR.

Key outcomes of the engagement on the 2020 audit report

During the consultation in 2020, community members were given the results of the 2020 AEPAR (audit report).

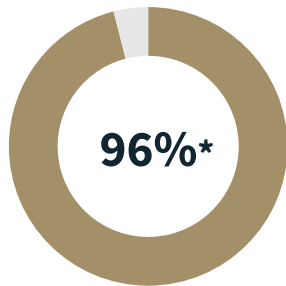
The key outcomes of the engagement were:

- Community members only asked a few questions regarding the AEPAR findings
- No concerns were mentioned about the health of fish or mussels in the McArthur River
- Community members gave feedback that the Annual Report Card gave better access to the AEPAR information
- To improve future rounds of engagement, the consultation process could be done over a longer time and extended to include surrounding outstations.



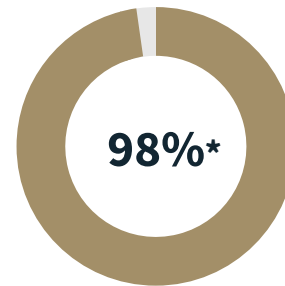
The main findings about the Mine Operator

The environmental performance of McArthur River Mining was worked out by checking how well they met the rules of the Mining Authorisation and Waste Discharge Licence and other environmental commitments and recommendations. The Independent Monitor found that McArthur River Mining met most of the conditions of the Mining Authorisation and the Waste Discharge Licence. The scores given for how well McArthur River Mining followed the rules are shown below.



Mining Authorisation compliance

- The audit looked at 221 Mining Authorisation conditions
- The audit found McArthur River Mining had a high level of overall compliance with the Mining Authorisation conditions at 96%
- 187 conditions were fully met and 34 conditions were partly met as they missed a small number of parts of the condition.



Waste Discharge Licence compliance

- The audit looked at 126 Waste Discharge Licence conditions
- The audit found McArthur River Mining had a high level of overall compliance with the Waste Discharge Licence conditions at 98%
- 116 conditions were fully met and 10 conditions were partly met as they missed a small number of parts of the condition.

Voluntary environmental commitments

McArthur River Mining have voluntarily committed to doing a list of things to improve the way they look after the environment, but these are not rules put on them by the government. These voluntary environmental commitments are written down in different documents - Mine Management Plans (MMPs), Operational Performance Reports (OPRs) and Environmental Mining Report (EMR).

Most of McArthur River Mining's commitments are met, with only 8 out of 161 ongoing commitments not fully addressed. There were improvements from the 2020 commitment reporting, but commitments could be better tracked and reported.

Risk Review

The review found that McArthur River Mining's Risk Management Plan meets international risk standards and gives McArthur River Mining ways to manage environmental risk for the mine.

To help improve risk management performance, the monitoring and review steps in the Risk Management Plan process could be improved.



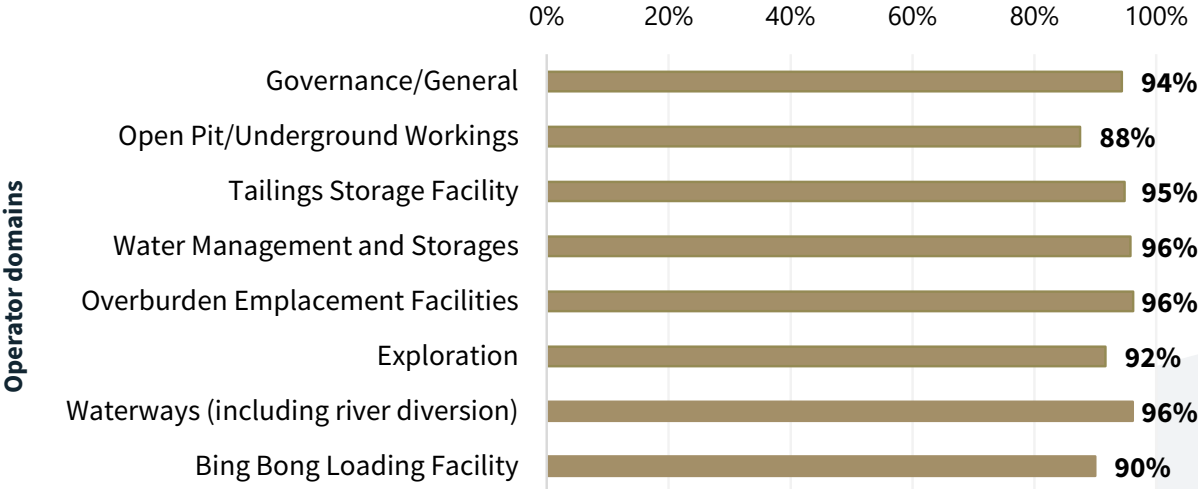
*note percentage considers scoring system on page 3

A deeper look at the findings about the Mine Operator...

To better understand McArthur River Mining’s environmental performance, the compliance scores for conditions of the mine’s approvals were matched against the key mining activities areas (Operator domains) and the key parts of the environment (Environmental aspects) that they relate to. This is explained further below and on the next page.

Mining activity areas (Operator domains)

As part of the audit, the mine was divided into ‘domains’ which represent the mine’s key activity areas, plus an extra area called Governance/General which is about the mine’s overall environmental management. The compliance scores for these areas are shown below.



The two areas of the mine’s activities that are seen to have the highest potential environmental risk, if not managed properly, are the:

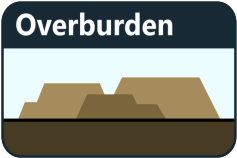


Tailings

Tailings Storage Facility, where leftover material from the mine processing is stored.



The Tailings Storage Facility scored 95% compliance.



Overburden

Overburden Emplacement Facilities, where waste rock is stored.



The Overburden Emplacement Facilities scored 96% compliance.

The Department has put the highest number of rules (Mining Authorisation conditions) on these domains because these activities are seen to have the highest chance of harming the environment if not managed properly. The high scores for these areas are a sign that McArthur River Mining is doing a good job at making sure that the mine’s workers are spending time and effort looking after the high-risk mining activity areas to manage them well.

The Open Pit/Underground Workings Operator Domain had the lowest compliance score of all the domains at 88%. This was because not all of the water taken from the borefield was being measured. This has now been fixed by McArthur River Mining.

A deeper look at the findings about the Mine Operator

Environmental aspects

Environmental aspects are the parts of the environment that may be impacted by the mine's operations. The audit checked how well McArthur River Mining met the rules of the Mining Authorisation that link to each of the environmental aspects. Overall, compliance levels were high with all but one, Aquatic Fauna, scoring 90% or above.

The Independent Monitor also scored how well McArthur River Mining met the rules for overall Monitoring and Reporting. Monitoring and Reporting is about how McArthur River Mining did their own checks and reported this to others. This was given a score of 94%.

To better this score, McArthur River Mining needs to improve on when they give information to the government and have more detail in the documentation from the Independent Certifying Engineer (a company which checks that the dams and the waste rock facility are being built correctly).



Vegetation and rehabilitation

To improve this score McArthur River Mining needs to prepare and submit a report that outlines what rehabilitation was done after exploration work.

96%

Surface water



97%

Marine water

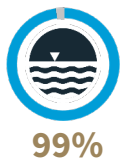


90%

Aquatic fauna



83%



Groundwater

To improve this score McArthur River Mining needs to make sure that all water taken from the borefield is measured. This is now fixed.

99%

These three water related environmental aspects had the same or linked compliance issues with collecting monitoring data. To improve these scores McArthur River Mining needs to make sure all records are kept, reports are given to the government on time and all water monitoring is carried out and recorded as required in the Water Management Plan.

Particular items that lowered the Aquatic Fauna score were:

- COVID-19 restrictions prevented samples being taken at some surface water monitoring locations
- Some sampling results not reported to the government due to laboratory issues
- Equipment failures impacting monitoring.



Waste management

To improve this score McArthur River Mining needs to provide further detail in the documentation for Independent Certifying Engineer checks for the waste rock and tailings storage areas.

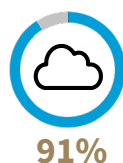
97%



Community

To achieve 100%, McArthur River Mining needs evidence of the 'no unauthorised entry' signage at the shipping channel..

99%



Air quality

To improve this score McArthur River Mining needs to update its plan to manage dust to include exploration works and carry out all the dust control measures and monitoring.

91%

The Mine Operator's key successes

The audit identified areas where McArthur River Mining did well to improve environmental performance. These areas included:

- Submitting the following to the government:
 - Adaptive Management Plan (this says what should be done in case results are different to what were expected)
 - Northern Overburden Emplacement Facility Interception Scheme (this focuses on groundwater management)
 - Site-Specific Guideline Values Review Report (this says what the natural water quality values should be)
 - Metals in groundwater and hydraulic connections study reports.
- Developing a Risk Management Plan in accordance with ISO31000, which is the key international risk and safety standard
- Improving the revegetation monitoring program to gather more information
- Putting in place the Trigger Action Response Plans (this says what needs to happen if monitoring results are more than expected levels)
- Building a trench beside the Tailings Storage Facility to divert groundwater which reduced sulphate and zinc levels in several groundwater bores and nearby Surprise Creek
- Achieving no surface water quality exceedances or non-compliances recorded
- Managing dust inputs to Barney Creek (including sediment removal)
- Rehabilitating the McArthur River Diversion Channel by planting grasses and trees
- Reducing erosion of access tracks by stabilising Bull Creek, as part of the McArthur River Diversion Channel Erosion Mitigation Project.

The Mine Operator's key opportunities for improvement

The audit found that McArthur River Mining could do the following key things to help improve its environmental performance:

- Review the Mine Management Plan every year and record the review in the Environmental Mining Report
- Better record in the Independent Certifying Engineer's reports that the design and construction works have been correctly completed
- Update the mine's list of water storage places to reflect site operations and better record inspections
- Improve water sampling and recording during water release from the Water Management Dam
- Provide dam construction reports to the government by the due date
- Continue to speak with local stakeholders about putting permanent water monitoring stations in local waterways
- Record more information to help track, update and complete actions to meet voluntary environmental commitments.

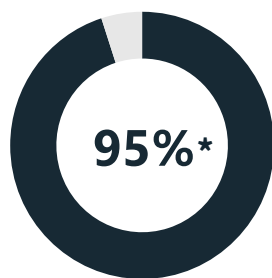
It is important to note that these are suggestions only and are not new rules that McArthur River Mining need to follow.

The main findings about the Department

The environmental performance of the Department was assessed by checking how well the Department had:

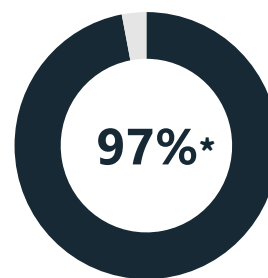
- Followed up relevant conditions of the Mining Authorisation
- Included NT EPA Recommendations as Mining Authorisation conditions
- Followed their own procedures for regulating McArthur River Mining.

The findings are listed below.



Mining Authorisation compliance

- The audit looked at 61 Mining Authorisation conditions
- The Department scored a high level of overall compliance of 95% against the relevant rules of the Mining Authorisation
- 50 conditions were fully met and 11 conditions were partly met as they missed a small number of parts of the condition.



NT EPA Recommendations

- The audit looked at 116 NT EPA Recommendations
- The Department was given a high overall compliance score of 97%
- 101 conditions were fully met and 15 conditions were partly met as they missed a small number of parts of the condition.

Regulatory procedures and approach review

The review looked at how well the Department managed the:

- Assessment for approval of Mining Management Plan and visits by Mining Officers to the mine
- Environmental Mining Report review
- Department's regulatory strategy for the mine
- Establishment of the Community Reference Group.

During the audit period the Department achieved two major targets. The Department worked with McArthur River Mining to review and simplify the Mine Authorisation and its conditions, and supported McArthur River Mining to update the Environmental Mining Report which made it easier to read and linked environmental information to environmental risk.

The review found the Department could streamline some of the ways it regulates McArthur River Mining.

*note percentage considers scoring system on page 3

The main findings about the Department

To better understand how well the Department met the rules of the Mining Authorisation, the rules were divided into six sections. These sections and their compliance scores are shown in the table below:

Section	Compliance score
General	95%
Water Management	88%
Tailings Storage Facility	93%
Environmental and Independent Monitoring	96%
Overburden Management Project	100%
Mine Closure	100%

The Overburden Management Project is the management of waste rock in the overburden emplacement facilities which is an area of high potential environmental risk, if not properly managed. The 100% compliance score for this area shows the Department is directing effort to well manage this area.

Water Management was given the lowest score compared to other sections (88% compliance). To improve this score the Department needs to get the surface water dam construction reports, with data signed off by the Independent Certifying Engineer.





The Department's key successes

The audit identified areas where the Department did well to improve environmental performance. These areas include:

- Continued strong focus on key environmental areas that could be high risk if adequate risk controls were not in place
- Continued practical approach to compliance and monitoring
- Better use of internal systems to manage environmental monitoring data and highlight any issues
- The updated Environmental Mining Report format which makes it easier to read
- Regular communication between the Department and McArthur River Mining helps keep a good working relationship to solve potential problems early
- Regular review of groundwater data to monitor groundwater dependent sites
- Updating the Environmental Mining Report to make it easier to work out the causes/ outcomes of environmental risk.

Continued improved environmental performance and high levels of regulatory compliance by McArthur River Mining can be attributed, in part, to the processes and approach developed and adopted by the Department for the Mine.

The Department's key opportunities for improvement

The audit identified key things that the Department could do to help improve its regulatory activities related to the Mine's environmental performance.

- Better track information needed to be provided by McArthur River Mining to the Department and follow up on any missing information
- Request for the Department's Environmental Monitoring Unit to do an inspection at the Mine in 2022
- Progress the set up of the independent panel of experts
- Review and further streamline the annual Environmental Mining Report process
- Document an internal procedure to improve the regulation of the Mine Authorisation and NT EPA recommendations.

It is important to note that these are suggestions only and are not new rules that the Department need to follow.

River Health

McArthur River Mining uses lots of ways to protect the health of the McArthur River so that people can keep using the river. McArthur River Mining has programs in place that check and manage potential impacts on river health.

The Independent Monitor assessed the condition of the McArthur River system using river and fish monitoring information provided by McArthur River Mining. The check looked at how the health of the river could potentially affect the fish and other plants and animals that live in the river. Overall, it was found that the McArthur River and its creeks were in good health.

Monitoring results show that metals above the level allowed by the Australian Food Standards were found in freshwater bony bream and rainbow fish in Barney Creek. This creek holds little water for much of the year. The samples taken from the creek are from spots inside the mining lease boundary right next to where mining activities happen and where the community cannot access.

Data collected over the 2020-2021 monitoring program found that all other fish from the McArthur River catchment, including commonly eaten fish like the barramundi and sooty grunter, had low levels of metals, and were considered safe to eat.

Metal levels will need ongoing checking and management in line with what the mine is already doing to continue to protect the river and the community.

Like the 2018-2020 mussels' sampling results, it was found that mussels in river catchments in the region have naturally occurring high levels of metals. The types of metals found in the mussels (such as arsenic, aluminium and manganese) are not the types of metals produced by McArthur River Mining's operations. The types of metals associated with the mining operations are zinc and lead. Because of the natural occurring level of metals in mussels across the region, it is suggested that eating mussels should be limited. It is considered very unlikely that people would be able to catch and eat enough mussels for it to be bad for their health, and there are not enough mussels living in the McArthur River catchment. The metal levels in the mussels are also similar to those found in everyday foods.

The monitoring data collected suggests that works done in 2020 to 2021 to make the McArthur River diversion channel more like natural river channels by planting river plants and placing woody debris (tree branches etc.), in the river, has improved the river habitat for the animals that live in the river.

The McArthur River and its creeks were found to be in good health and the fish were safe to eat.





Comparison of 2020 and 2021 audit results

River Health

There was no change in the river system health from 2020. The river monitoring showed:

- The same numbers and types of freshwater animals living in the McArthur River system
- That the McArthur River and its creeks are in good condition
- An extremely low risk to human health from eating the monitored fish species caught in the McArthur River catchment upstream or immediately downstream of the mine.

The Mine Operator

- McArthur River Mining's overall high compliance score increased by 1% to 96% in 2021
- The number of opportunities for improvement identified in 2021 increased by 13 to 43.

The Department

- The Department's overall high compliance score decreased by 2% to 95% in 2021
- The same number of opportunities for improvement (27) were identified in 2020 and 2021.

Status of the opportunities for improvement identified during the 2020 audit

- **Five out of the 30 opportunities for improvement from 2020 have been carried over for McArthur River Mining**
- **Nine out of the 27 opportunities for improvement from 2020 have been carried over for the Department.**

Next audit

- The next environmental performance audit review will start in mid 2022 and will look at the period between 1 May 2021 and 30 April 2022
- The Independent Monitor will continue to talk to the local community about the findings of the 2021 AEPAR and future reports.

Conclusions

A summary of the main findings of the review by the Independent Monitor were:

- Overall, the McArthur River and its creeks were in good health and the fish were safe to eat
- McArthur River Mining and the Department worked together to update the yearly Environmental Mining Report, so that monitoring results are used better to manage the mine's environmental risk.

The Operator - McArthur River Mining

- McArthur River Mining scored a high level of overall compliance with the Mining Authorisation conditions and the NT EPA Recommendations. That is, McArthur River Mining did well at following the government's rules
- The review did not identify any environmental issues requiring urgent investigation
- McArthur River Mining's compliance score across all areas of the mine's operations showed that they met the rules put on them by the government
- McArthur River Mining had a good Risk Management Plan in place that helped lessen the environmental risks of the mine's operations. The risk process could be improved by better monitoring and reviewing of their management actions.

The Department - The NT Department of Industry, Tourism and Trade

- The Department achieved a high level of overall compliance with the Mining Authorisation conditions and the NT EPA recommendations
- The review of the Department's regulatory procedures and approach found that the Department had a strong focus on key potential environmental risks, and a practical approach to compliance and monitoring
- A big achievement for the Department was the update of the Mine Authorisation making it a more useable document
- Regular site inspections by the Department helped check the mine's operations against the McArthur River Mining's management plans
- It was found that the Department could simplify some of their processes, especially the ones that need to be done regularly
- The Department had effectively included the NT EPA recommendations into the Mine Authorisation conditions
- The Department scored highly on compliance
- Progress was made by the Department in forming a Community Reference Group.





Acknowledgement of Country

Advisian Pty Ltd respectfully acknowledges the Traditional Owners of the Borroloola and Gulf region, and their continuing culture and connection to the lands and waters. We pay our respect to their Elders, past and present.

More information

If you would like more information about the Independent Monitor or to access the full Annual Environmental Performance Audit Report please visit the DITT Independent Monitor website at: www.industry.nt.gov.au/MRM-Independent-Monitor.

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