

Wishful zinking

Economics of the McArthur River Mine

The McArthur River zinc-lead mine in the Northern Territory imposes significant environmental costs on the local community. Claims that it could produce government revenue of over \$1.5 billion are based on flawed economic modelling that estimates tax revenues over a 1,000 year period.

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Summary

The McArthur River zinc-lead mine in the Northern Territory imposes significant costs on the local community with impacts on water and emissions from waste rock dumps. Multinational commodity trader Glencore owns the mine and is pushing to expand, claiming that the expansion would generate tax and royalty payments of over \$1.5 billion.

Glencore's claim is based on modelling by consultants Aurecon which relies on assumptions that are almost comical. For example, the modelling assumes that Glencore will pay NT payroll tax for 1,000 years, out to the year 3017. This is the equivalent of economists in the year 1017 assuming that King Cnut's annual tax on animal hides possessed by England's tenant farmers would still be paid today.

Aurecon's estimate that McArthur River will pay \$435 million in royalties is not backed by any disclosed working or sources and ignores the fact that the mine is known to pay zero royalties in most years. The only known royalty payment, of \$13 million, came in 2008 after an historic peak in the zinc price. At best the mine would contribute just one third of one percent of NT government revenue.

The mine's Community Benefit Trust provides benefit to the community, but its value appears to be overstated in Aurecon's economic assessment. It accounts for only a fraction of the cost of service provision to the local area and focuses on local enterprises such as a store upgrade, fencing and machinery. The Trust does not provide 'vital public services', as claimed by Aurecon. These are provided by government.

Aurecon's estimate that McArthur River will pay \$1,035 million in company tax is also not based on any disclosed working or sources. This also ignores information in the public domain that Glencore has often paid zero company tax in Australia and that in years when it does pay company tax, it is at much lower levels than Aurecon imply.

Employment is not a significant benefit of the project. Despite a local unemployment rate estimated by Aurecon at over 20%, Glencore estimates only 4% of the mine's workforce will be local people. Others will fly-in-fly-out (FIFO).

Claims of 2,374 'indirect' jobs are based on discredited modelling methods. 'Input-output' modelling is described as "biased" by the ABS and "abused" by the Productivity Commission. Despite this, Aurecon apply this methodology over a 1,000 year period, assuming that the structure of industries does not change with changes in technology. A hypothetical economic modeller in 1017 doing the same thing would have assumed

away the potential invention of the printing press, the steam engine, antibiotics or the economic consulting industry itself.

The environmental and social costs of the McArthur River mine are current and significant, while any economic benefit to the Northern Territory is uncertain and likely to be insignificant. It is likely that revenues to the NT government from the project do not cover past subsidies or potential future environmental liabilities. From an economic perspective, it is likely that the best approach would be to close the mine and rehabilitate the site, and to ensure that Glencore pays for the rehabilitation.

Introduction

The McArthur River Mine is a zinc and lead mine near Borroloola, Northern Territory (NT), close to the Gulf of Carpentaria. Owned and operated by multinational company Glencore, the mine is known for its environmental impacts including contamination of waterways and smouldering waste dumps.¹

The draft Environmental Impact Statement (EIS) for the latest phase of the McArthur River Mine places considerable emphasis on the project's economic impacts.² For example, the first section of the Executive Summary states:

This Project estimates significant benefits arising from the approved mine life with taxes and royalties exceeding \$1.5 billion over the four phases...

This claim is based on EIS *Chapter 12 Socio-Economic Environment*, written by Glencore, and *Appendix Z Economic Impact Assessment Report*, by consultants Aurecon. The modelling and economic analysis in these EIS documents is of low standard. They clearly do not meet economic assessment guidelines³ and are based on assumptions that are at times almost comical.

¹ See for example Bardon and Vernon (2016) *Protesters call for Glencore to close McArthur River mine and clean-up the site*, <http://www.abc.net.au/news/2016-05-19/protest-outside-glencore-calls-for-company-to-close-mrm/7428972>

² Full EIS available at <https://ntepa.nt.gov.au/environmental-assessments/register/mcarthur-river-mine-overburden/draft-environmental-impact-statement>

³ For example, no cost benefit analysis is provided. NT Government guidelines provide little guidance, but emphasise the need to assess economic and social benefits and costs. Other jurisdictions provide extensive guidance on how cost benefit analysis should be conducted. See NT EPA (2013) *Guidelines for the preparation of an economic and social impact assessment*, https://ntepa.nt.gov.au/data/assets/pdf_file/0006/287430/guideline_assessment_economic_social_impact.pdf, Department of Finance (2006) *Handbook of cost-benefit analysis*, https://www.finance.gov.au/sites/default/files/Handbook_of_CB_analysis.pdf, NSW Planning (2015) *Guidelines for the economic assessment of mining and coal seam gas proposals*, http://www.planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/~/_media/C34250AF72674275836541CD48CBEC49.ashx

Modelling over 1,000 years

The Aurecon assessment estimates economic values relating to the McArthur River mine out to the year 3017, including payroll tax, GSP and employment impacts. Economists are usually wary of modelling any economic impact beyond ten or twenty years into the future. To estimate the value of a particular tax or any economic impact 1,000 years into the future is unprecedented in the experience of The Australia Institute and is patently ridiculous.

This approach is akin to economists in the year 1017 modelling to the present day:

- The heregeld tax of King Cnut, who ruled England from 1016 to 1035. The tax was based on the number of animal hides that tenant farmer owned and was levied annually.⁴
- The Northern Song dynasty (960-1126) practice of tax via forced or ‘corvee’ labour.⁵
- The economic and trade system of indigenous Australians.

While Aurecon note in their assessment that it is “more realistic” not to include estimates from 2073 to 3017, Glencore use values for the full thousand years. For example, the estimate of taxes and royalties exceeding \$1.5 billion mentioned above is based on:

- \$1.038 billion in corporate tax payed to the Commonwealth
- \$435.4 million in royalties payed to the NT
- \$117.4 million in payroll taxes to the NT Government⁶

The payroll tax estimate here consists of:

- \$102.9 million in total over the 55 years of Stages 1 to 3
- \$14.5 million over the 945 years duration of Stage 4.⁷

⁴ https://en.wikipedia.org/wiki/Taxation_in_medieval_England

⁵ The Northern Song Dynasty ruled from 960 to 1126 and like many Chinese dynasties collected taxes via forced labour, although this could be avoided with cash payment in some circumstances.

https://en.wikipedia.org/wiki/Taxation_in_premodern_China

⁶ See Chapter 12, Socio-economic environment, p12-53, Table 12-20 Residual Risk Assessment

⁷ See Appendix Z Economic impact assessment, p33. Note that Aurecon do not include Stage 4 payroll tax in their concluding figures, because of the “very long assessment period”, but Glencore do include this estimate in their headline figures.

Standard practice in economic assessment is to discount values in the future due to the uncertainty around them, using a ‘discount rate’.⁸ While the appropriate discount rate to use for any particular assessment is a topic of debate among economists, at any rate above 1% Aurecon’s estimate of payroll tax for Stage 4 has a real present value at less than \$1 million. At the rate of 7% recommended in NSW Guidelines, this value would be \$5,290, not the \$14,458,500 estimated by Aurecon.

If Aurecon had adapted the standard practice of discounting future values, its assessment of royalties and taxes would also be affected and of far more use for decision makers.

A final consideration around the economic assessment of the millennium-long monitoring phase of the project is that according to the EIS, there is a high risk that “Long-term closure monitoring cannot be achieved”:

Current closure costs allow for period of 25 years closure water monitoring with limited costs associated with management and maintenance of the site.

...

funding only for 25 years. Long-term overtopping and failure of levee is a certainty so mine pit lake will mix with receiving environment eventually.

...

Funding mechanisms agreed with regulators to provide for adaptive management and reactive management phases.⁹

If arrangements have been agreed with the NT government for the long term site management, it will be the NT government paying these taxes to itself, eliminating any public benefit.

Furthermore, the risk assessment highlights the risk that long term environmental impacts will impose costs on the local community. This has not been included in the economic assessment by Aurecon, a major omission and in contravention of most government guidelines for economic assessment.

⁸ Discount rates also need to include consideration of risk, inflation, time value of money and other factors.

⁹ Glencore (2016) *EIS Chapter 7, Project Risk Assessment*, <http://www.mcarthurriverrivermine.com.au/en/EIS/eisdocuments/Chapter-07-Project-Risk-Assessment.pdf>, p7-29. See also Davidson (2017) *Glencore document suggests mine site could revert to NT before rehabilitation complete*, <https://www.theguardian.com/business/2017/aug/25/glencore-document-suggests-mine-site-could-revert-to-nt-before-rehabilitation-complete>

Royalties

Aurecon estimate the McArthur River Mine will pay \$435.4 million in royalties. They provide no working and no references to support their estimate. They make no mention of subsidies received by Glencore. Aurecon's entire royalties section is presented in Figure 1 below:

Figure 2: Aurecon royalty estimate section

6.2.2 Northern Territory Royalties

The forecast of up to 800,000 dmtpa of concentrates over the project's operating phase is estimated to provide \$435.4 million in royalties to the Northern Territory government's revenue base over Stages 1 and 2. The extent of royalties will be directly related to production levels that are in turn subject to international demand.

Source: Appendix Z: Economic Impact Assessment Report, p33.

Royalties in the NT are more complicated than Aurecon describe in Figure 1, relating to far more than just production levels.

First, however, it is important to understand what royalties are. The minerals in the ground at McArthur River are owned by the people of the NT. Mining companies pay royalties to purchase the minerals from the public. This is not a tax, but a payment for an input, much like a baker buys flour before making bread. Before Glencore sells zinc concentrate, it must purchase the zinc ore from the NT public.

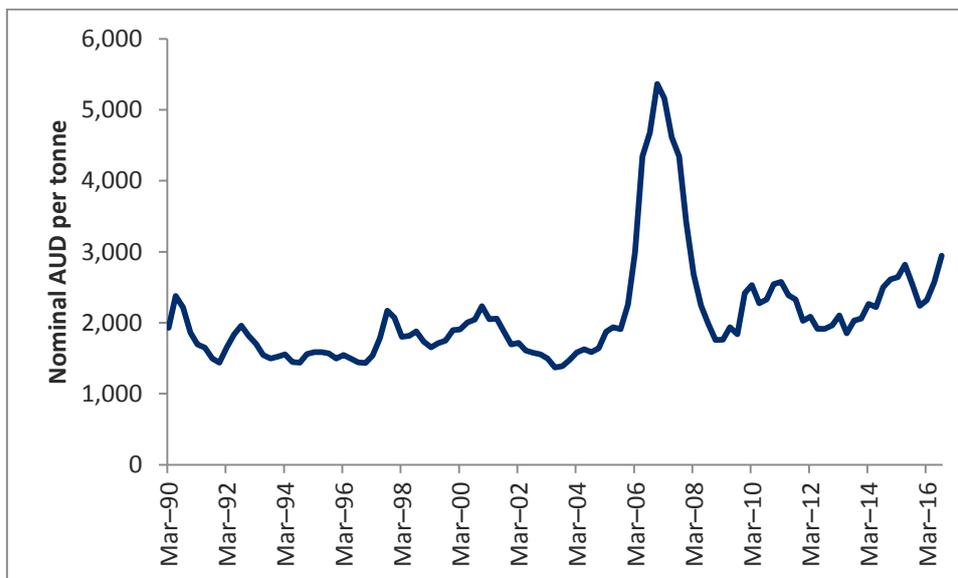
Aurecon fail to explain that under NT royalty arrangements, royalties are profit-based. Rather than paying the public for the zinc based on how much they dig, Glencore only pay the public if they make a large enough profit on selling the concentrate. This arrangement is unusual in Australia. In most other states, the public is paid for their royalties based on how much is produced and its market price. This is like the baker only paying for flour if he/she makes enough profit on selling the bread later.

This is the reason why McArthur River often pays no royalties at all. While this information is not usually made public, leaked information has shown that no royalty was paid from the mine's opening in 1995 through to 2007, despite receiving a \$5 million per year subsidy from the Territory government. Royalties of \$13 million were

paid in 2008, but zero in 2009. No information is available from 2010 to 2015 when again zero royalties were reported.¹⁰

A likely reason for a royalty payment in 2008 but nothing in other years is that zinc prices were unusually high in 2007-08, as shown in Figure 2 below:

Figure 2: Zinc price history



Source: Department of Industry (2017) *Resource and Energy Quarterly March 2017*. Unit is Nyrstar SH Grade, 98.5 per cent

This price spike is the likely explanation behind the 2008 royalty payment. Given the subsequent decline in prices, it is likely McArthur River has not paid a royalty since.

Despite this information being in the public domain, Aurecon estimate that the mine will pay \$435.4 million in royalties over 20 years. This equates to an average annual royalty payment of \$21.8 million, more than 50% greater than the only known annual royalty payment, made after a year of historic high zinc prices.

Even if we take Aurecon's estimate at face value, standard economic assessment would discount this revenue stream into a present value. At a discount rate of 7% the royalty stream has a present value of \$230.4 million. However, given the history of McArthur River royalty payments and zinc prices, even this estimate is highly optimistic.

¹⁰ Kean (2010) *Life under NT's profit-based royalty regime: Xstrata has no complaints*, <https://www.crikey.com.au/2010/06/09/life-under-nts-profit-based-royalty-regime-xstrata-has-no-complaints/>, Everingham (2017) *Mining giant Glencore paid '\$0' in royalties to Northern Territory Government*, <http://www.abc.net.au/news/2017-04-26/mining-giant-glencore-paid-no-royalties-to-nt-government/8472350>

Putting potential royalty payments in context, the Northern Territory Government had revenue of around \$6.5 billion in 2016-17. All mining royalties accounted for \$170 million of this, just 2.6%. Even if McArthur River was to pay the annual average royalties forecast by Aurecon, this represents just one third of one percent of NT government revenue.¹¹

¹¹ NT Treasury (2017) *Budget Strategy and Outlook*,
https://budget.nt.gov.au/data/assets/pdf_file/0007/277603/BP2-2017-18-book.pdf

Community Benefit Fund

The economic assessment makes reference to the mine's Community Benefits Trust and the mine's other:

Generous contributions to local health, education, cultural and capacity building initiatives and the funding of vital public services and infrastructure development projects facilities that encourage healthy lifestyles for youth and improve understanding of traditional culture.

The economic assessment states that \$1.35 million each year will be put into the community benefit trust, a total of \$27 million over the life of the project. While this funding is a clear benefit to the community, three points need to be raised.

Firstly, as discussed above, standard practice in economics is to express future streams of income in present value terms, to account for inflation, uncertainty and time value of money. In present value terms the contributions to the Community Benefit Fund are worth \$14.3 million at a 7% discount rate.

Secondly, reporting of the history of the fund suggests slightly less than \$1.35 million is paid each year. The 2015 Community trust book states that \$10.4 million has been contributed over eight years, or \$1.30 million, while the March 2017 Fact Sheet states a total value of \$12.3 million over 10 years, around \$1.23 million per year.¹²

Thirdly and most importantly, these payments need to be seen in the context of the full costs of providing services to the local community. The Roper Gulf Regional Council spent \$2.8 million in Borroloola alone in 2017, including \$427,632 operating the swimming pool.¹³

Other services are funded by the NT Government. While Borroloola-specific spending is difficult to find, NT Budget Papers give an indication of the magnitude of these services. For example, the Top End Health Service budgets \$95 million to operate its 28

¹² McArthur River Mine (2015) *Community Benefits Trust*, http://www.mcarthurrivermine.com.au/en/publications/CommunityBenefitsTrust/MRM_Trust-Book_WEB.pdf ; McArthur River Mine (2017) Community Benefits Trust Fact Sheet, http://www.mcarthurrivermine.com.au/en/EIS/FactSheets/2017_MRM%20Fact%20Sheet_Community%20Benefits%20Trust.pdf.

¹³ Roper Gulf Regional Council (2016) *2016-17 Annual Budget*, <http://ropergulf.nt.gov.au/wp-content/uploads/2014/02/2016-17-budget-for-website-pp88-103.pdf>

remote primary health clinics, one of which is in Borroloola.¹⁴ This is an average of \$3.4 million per clinic each year. Other NT government costs involved in providing services to Borroloola relating to health, education and transport, etc, cost many millions more. While the Community Benefit Fund is a positive contribution to the community, it is misleading to say it provides “vital public services”, which are in fact provided by governments.

This can be seen in the Community Benefit Fund’s statements, which show that nearly half of its funding is directed towards ‘Enterprise and Job Creation’ activities, such as contributions to upgrading the local store, “fencing to protect stock from dingo attack, visitor accommodation and kitchen facilities, a concrete batching plant and agitator, grader, drum roller and loader”. Only a small fraction of the Fund’s money is directed to health, with projects such as suicide prevention workshops and cancer awareness programs. These are surely laudable projects, but they are not the main health or other vital services provided to the community, which come from government.

¹⁴ NT Treasury (2017) Agency Budget Statements 2017-18, https://budget.nt.gov.au/data/assets/pdf_file/0008/277604/BP3-2017-18-book.pdf

Company tax

Aurecon's estimate of company tax payments by McArthur River also shows no working or sources. Aurecon's entire company tax section is presented in Figure 3:

Figure 3: Aurecon company tax section

6.2.3 Commonwealth Government Corporate Tax

The total corporate tax revenues to government are estimated at \$1.038 billion over the project's years' duration. This estimate of corporate tax is based on 2015 modelling and is subject to changes based on fluctuations in future production level or official tax rates.

Source: Appendix Z: Economic Impact Assessment Report, p33.

As with past royalty payments, there is little information around Glencore's past company tax payments. It is known, however, that the company often pays zero in company tax. ATO data shows that despite \$108,107,993 in taxable income, Glencore entities paid no company tax in 2014-15.¹⁵ Media reports suggest Glencore paid zero company tax for the three years to 2014, although this is contested by the company.¹⁶

Glencore's "Tax Transparency in Australia" webpage reports total company tax payments of \$2,290 million since 2007. This is derived from Glencore's total activity in Australia over a decade, which includes 24 mines, 24,000 hectares of agribusiness operations, port facilities and trading operations.¹⁷

Based on these figures, on average Glencore pays \$229 million per year in company tax. Aurecon's estimate of \$1,038 million over the 20 year production phase equates to \$52 million per year. The suggestion is that McArthur River would be responsible for almost a quarter of Glencore's average company tax payments. This is highly unlikely, as the mine accounts for a very small portion of Glencore's overall operations and has rarely paid any royalties, which are also based on profits, discussed above. Given the mine's unprofitable past and Glencore's record on company tax, it is possible it would not contribute anything to company tax receipts.

¹⁵ ATO (2017) *Corporate tax transparency*, <https://data.gov.au/dataset/corporate-transparency>

¹⁶ West (2014) *Glencore tax bill on \$15b income: zip, zilch, zero*,

<http://www.smh.com.au/business/glencore-tax-bill-on-15b-income-zip-zilch-zero-20140626-3awg0.html>

¹⁷ Glencore (2017) *Tax Transparency in Australia*, <http://www.glencore.com/public-positions/tax-transparency/tax-transparency-in-australia/>, Glencore (2017) *Our operations*, <http://www.glencore.com.au/en/who-we-are/glencore-in-australia/Pages/our-operations.aspx>

Employment

The Aurecon assessment estimates that just 35 people from the local area would work on the operational stage of the mine, out of a total workforce of 845, or just 4%. Stage 2 would see 22 locals employed out of 184 workers, or 12%, as shown in Figure 4 below:

Figure 4: Average annual mine employment numbers for mine stages 1 and 2

Stage	Borroloola/ Gulf Area	Other Northern Territory	Total Northern Territory	Rest of Australia	Total Workforce
Stage 1 Operations 2018 to 2037	35	441	476	369	845
Stage 2 TSF Re- processing 2038 to 2047	22	89	111	73	184

Source: Appendix Z: Economic Impact Assessment Report, p4.

Aurecon report 285 people were unemployed looking for work in the Gulf Statistical Local Area, giving a local unemployment rate of 20.2%. While a substantial fly-in-fly-out (FIFO) workforce is probably inevitable, this demonstrates that no matter how large mining projects are, they generally do not have a substantial impact on local unemployment, even (or perhaps especially) in remote areas.

Decision makers should focus their attention on the total workforce estimates in Aurecon’s research, shown in Figure 4 above. In other parts of the assessment, Aurecon report ‘indirect’ or ‘flow-on’ jobs of up to 2,374. To derive this estimate, Aurecon use input-output modelling, which has been widely discredited.

Input-output modelling

The kind of modelling used by Aurecon to calculate the indirect or ‘flow-on’ benefits of the McArthur River Mine project is ‘input-output’ modelling. This uses ‘input-output’ tables which estimate the relationships between different industries in the economy and are compiled by the Australian Bureau of Statistics (ABS) for their calculations of economic indicators such as Gross Domestic Product. While input-output tables are needed for tasks like GDP calculations, the ABS considers them “biased estimator[s] of the benefits or costs of a project” that are “likely to significantly over-state the impacts of projects” when used for project assessment as Aurecon has done.¹⁸

The ABS explains that input-output models:

- Lack resource constraints – they assume there is an infinite amount of resources available to the economy, so a project like McArthur River can proceed with no impact on other projects.
- Have fixed prices – so assume that prices of goods and services don’t change no matter what the impact of the project
- Are not suitable for small areas – data is not collected for small economies, and the model needs to be derived from national or state level tables.

The ABS view on input-output modelling is shared by the Productivity Commission, which considers it to be regularly “abused”,¹⁹ a view shared by many other economists,²⁰ and the NSW Land and Environment Court, which considers it “deficient”.²¹

¹⁸ ABS (2010) Input-output multipliers, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Previousproducts/5209.0.55.001Main%20Features4Final%20release%202006-07%20tables?opendocument&tabname=Summary&prodno=5209.0.55.001&issue=Final%20release%202006-07%20tables&num=&view=>

¹⁹ Gretton (2013) *On input-output tables: uses and abuses*, <http://www.pc.gov.au/research/supporting/input-output-tables/input-output-tables.pdf>

²⁰ Layman (2002) *The Use and Abuse of Input-Output Multipliers*, <https://www.treasury.wa.gov.au/uploadedFiles/ecoresearchchart2002.pdf>; Denniss (2012) *The use and abuse of economic modelling in Australia: Users guide to tricks of the trade*, http://www.tai.org.au/sites/default/files/TB%2012%20The%20use%20and%20abuse%20of%20economic%20modelling%20in%20Australia_4.pdf

²¹ Preston (2013) *Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Limited*, <https://www.caselaw.nsw.gov.au/decision/54a639943004de94513da836>

All the input-output results in Aurecon's assessment should be treated with suspicion, particularly as they provide minimal detail on how they have conducted their modelling exercise. Aurecon's application of input-output assessment over a 1,000 year period assumes that the structure of the economy will not change. This is the equivalent of economists in the year 1017 modelling a 2017 economy without potatoes, chocolate, tobacco and tomatoes (outside of the Americas) or the invention of the printing press,²² the compass, cannons, the steam engine, anaesthetics, antibiotics or the economic consulting industry.

²² Or even of movable type, another innovation of the Northern Song Dynasty, https://en.wikipedia.org/wiki/Movable_type

Conclusion

The NT government estimates their cost of cleaning up abandoned mines in the NT would be over \$1 billion.²³ Given this history and the present reality of the McArthur River Mine's impacts on the environment and local community, it is likely that the environmental costs imposed by the mine will be far greater than the uncertain revenues that could be generated. From an economic perspective, it is likely that the best approach would be to close the mine and rehabilitate the site, and to ensure this is paid for by Glencore.

²³ Department of Primary Industry and Resources (2016) *About legacy mines*, <https://dpir.nt.gov.au/mining-and-energy/mine-rehabilitation-projects/about-legacy-mines>