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Re: Cameco Australia Pty Ltd JV Mitsubishi Kintyre uranium project Environmental Review and Management Programme (ERMP)

Please find enclosed this submission which was prepared with help and advice from Dr Jim Green, Dr Gavin Mudd and Mara Bonacci. This submission is for the Environmental Protection Authority of Western Australia on behalf of the Conservation Council of WA, the Australian Conservation Foundation, Friends of the Earth Australia, the Anti Nuclear Alliance of WA and the Wilderness Society.

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Yours sincerely,

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1. INTRODUCTION

The Conservation Council of WA, the Australian Conservation Foundation, Friends of the Earth Australia, the Anti Nuclear Alliance of WA and the Wilderness Society have prepared this submission for the WA EPA in response to Cameco Australia's Environmental Review and Management Programme (ERMP) for its proposed Kintyre Uranium Project.

After careful review, we note that the ERMP is incomplete, the proposal is dangerously flawed and conclude that the WA EPA should not give Cameco approval to develop a uranium mine at Kintyre.

Australian uranium mines have a history of leaks, safety breaches and failed rehabilitation. Accordingly, a 2004 report by the Federal Senate References and Legislation Committee found *"a pattern of under-performance and non-compliance"* in the uranium mining sector. There is not a single example of a uranium mine in Australia that has been rehabilitated to the point that radiological conditions are stable and ongoing monitoring is no longer required. The lack of proper rehabilitation coupled with the economic uncertainty facing the uranium industry puts Western Australian tax payers at risk of inheriting expensive and long term legacy sites.

These extraordinary risks are made worse due to the sensitive location of the Kintyre uranium deposit. The proposed Kintyre uranium mine could substantially impact on the Karlamilyi National Park and the Rudall River catchment area. The project area is in the

watershed for the Rudall River and plays a significant role in the ecological processes of the Karlamilyi National Park. The area includes permanent water holes, ephemeral rivers and salt lakes. This is also a significant paleodrainage channel region with the Rudall River, Yantakuji Creek, Coolbro Creek, Watrara Creek, and Rooney Creek- ephemeral creeks and rivers. This area has high levels of local endemism.

Despite the Kintyre exploration site being excised from the National Park under contentious circumstances, the area still maintains a high level of ecological significance to the National Park and its ecosystem. Uranium mining at Kintyre poses a long term threat to the National Park, yet impacts to the National Park have not been addressed in the ERMP along with a number of other significant environmental factors.

Throughout this submission we maintain that:

1. The history of non-compliance and broken promises by the uranium sector should be a serious consideration by the EPA from an environmental pollution, intergenerational equity and precautionary principle perspective.
2. The history of non-compliance within the WA mining sector and a failure to adopt and implement Government motions and advice from the DMP's own Uranium Advisory Group (UAG) should be considered by the EPA with attention given to the capacity of the relevant authorities to safely regulate uranium mines in WA.
3. Regardless of the optimistic views by the nuclear industry about a recovery in the uranium price there is currently a clear decline in the global nuclear industry. There is no evidence that a recovery will be sufficient to warrant the development of uranium mines in WA from either an economic or social benefit perspective.
4. Cameco's Environmental Review Management Plan (ERMP) is incomplete and in need of further studies and management plans. This highlights a problem with the integrity of the ERMP process, transparency and public scrutiny.
5. There should be a full assessment of the global impacts of uranium mining and the nuclear industry, without which the WA Government cannot make a proper assessment on whether the very serious and long term risks of development of a uranium mine are in WA's best interest. The only forum we have been able to identify where this type of assessment is possible is through section 40 (2)a of the EP Act 1989
6. The Kintyre project area should not have been excised from the Karlamilyi National Park as it retains all the key and significant environmental values of the National Park and contributes to the wider catchment area. The development of a uranium mine at such close proximity puts the National Park at risk.

In its current form, Cameco's Kintyre uranium ERMP should be rejected on the basis that there is incomplete information, baseline studies are deficient and management plans are still pending. This current public review period is the only legislated requirement for public review and comment. The Kintyre ERMP has failed to meet basic public expectations on transparency. **Cameco's application should not be assessed let alone approved until serious data gaps have been addressed and the public have had time to consider and comment on the full ERMP.**

2. DEFICIENCIES IN WA REGULATION

There are five main areas of WA regulatory deficiency that make this and any other uranium proposals unacceptable:

1. Changes to the Mine Closure Guidelines and mine closure bonds
2. A failure to address concerns raised by the Department of Mines and Petroleum's Uranium Advisory Group including the 1999 Tailings Guidelines and a lack of transparency
3. The lack of action to implement the 2012 motion to require the isolation of uranium mine tailings from the environment for no less than 10,000 years
4. The deferral of the assessment of significant environmental aspects of proposals from the EPA to the DMP, removing any legally enforceable requirements to comply with environmental conditions on those aspects
5. Broader and global environmental impacts from uranium mining and export should be assessed by the EPA, this may require assessment by way of a public inquiry under the provisions of the 40 (2) (c) of the EP Act[1].

These issues are discussed in further detail below.

Mine Closure

Recent changes to the Mine Closure Guidelines do not adequately address or identify the unique risks of uranium mines such as the long term risks to the environment from radioactive mine waste including tailings and waste rock, the high cost of closure or the extended period of risk and liability. The Mine Closure Guidelines works on a risk-based assessment and attempt to incorporate all levels of risk and hazard. Neither sufficient attention nor description has been given to the very unique aspects of uranium. The Mine Closure Guidelines have no criminal penalties for non-compliance, thus removing any significant reason for compliance. In addition to the changes to the Mine Closure Guidelines, there has been the development of a Mining Rehabilitation Fund (MRF) to fund abandoned mines and any future abandoned mines. The development of the MRF has also meant the removal of closure bonds for new mines. There are strong arguments for maintaining bonds as an incentive for mining companies to rehabilitate. There is well documented evidence about mine closure and rehabilitation failure at former uranium mines. Any uranium mines in WA could be an uncapped liability for Western Australians without strong conditions on closure that are legally enforceable and with bonds as an incentive.

We urge the EPA to recommend to the Minister that uranium mines retain the requirement for a 100% mine closure bond in addition to the 1% MRF levy. We also advocate that conditions be imposed to lay criminal charges for not meeting mine closure and rehabilitation requirements. The Conservation Council of WA has made a submission to the Department of Mines and Petroleum (DMP) on the specific issues with uranium and mine closure (Appendix 1.)

Uranium Advisory Group Recommendations

[1] Environmental Protection Act 1986 http://www.austlii.edu.au/au/legis/wa/consol_act/epa1986295/

Former WA Minister for Mines and Petroleum Norman Moore established the Uranium Advisory Group (UAG) to benchmark WA's regulations for uranium mining with 'Worlds Best Practice'. There were several areas where WA regulations fell short (Appendix 2). The UAG made recommendations that the DMP amend the 1999 Tailings Guidelines. The DMP is yet to make any changes to the guidelines and have not indicated when changes will be made; though we are assured they are considering these recommendations.

There are also serious limitations in the DMP's ability to hold companies accountable for non compliance with environmental conditions. In the Mining Act 1978[2] there are no heads of power given to the Department of Mines and Petroleum to regulate or enforce conditions on environment or assess Environmental Management Plans. In a DMP report on improving environmental regulations there are many recommendations to improve compliance with the environment,[3] despite this there are still no legislative powers for the DMP to enforce compliance with environmental obligations. Equally there are no powers for the EPA to enforce environmental conditions imposed by the DMP.

Transparency/ Public Inquiry

The UAG also made a very strong recommendation about increasing public scrutiny, transparency and accountability. There have been no formal changes to the DMP to address issues around public scrutiny, transparency or accountability.

Cameco's Kintyre ERMP, with incomplete management plans, will go to the Federal Government for assessment through the Department of Environment. Several management plans will then be assessed by the DMP. There is no official or legislated requirement for the DMP to make those documents available for public review before or after assessment. This public review of the ERMP is the public's only opportunity to review management plans, and as it stands there is no management plan at all for tailings, the most significant environmental threat from a uranium mine. There is a conceptual mine closure plan and a draft transport plan. There is no indication that there will be a period for public review for these management plans once they have been completed. Cameco has handpicked some stakeholders it will engage with over management plans; however this excludes every group on this submission and the thousands of people who have lodged a submission to the EPA.

Cameco's application states that the ERMP covers mining, processing and (domestic) transport of uranium but excludes other aspects of the nuclear fuel cycle. This may be common practice for uranium mining applications however it does not meet public expectations or allow room to hear public concerns about the global impact. The West Australian Government, which is currently seeking to administer 'World's Best Practice', should require an assessment of global implications of Western Australian uranium mining as part of the approval process. The failure to address downstream processing issues is a major deficiency in the current planning and assessment regime and is further evidence of

[2] WA Mining Act 1978 http://www.austlii.edu.au/au/legis/wa/consol_act/ma197881/

[3] Department of Mines and Petroleum – Report – Reforming Environmental Regulation www.dmp.wa.gov.au%2Fdocuments%2FReforming_Environmental_Regulation_in_the_WA_Resources_Industry_-_Final_Report_to_Minister(1).pdf&ei=CtjYUv6hNozckgWDv4HIAg&usg=AFQjCNF2CAxTOIMy7Aj0QdloZiRMMWFlTg&sig2=rZAgQrD68R9j0FIx1mIlw&bvm=bv.59568121,d.dGI&cad=rja

the need for a public inquiry under section 40 (2)(c) of the EP Act[4].

3. KINTYRE PROJECT RATIONALE

Cameco's ERMP (Section 2.4) states that the outlook for nuclear power and the uranium industry *"remains uncertain for the near to medium term"* but that in the long term *"Cameco continues to see a very strong and promising growth profile for the nuclear industry."*

Cameco's projections for the growth of nuclear power capacity, and thus uranium demand, are wildly implausible. This raises two problems. The first is a problem for Cameco and its shareholders: investing resources in high-risk ventures on the basis of wildly implausible projections is not good business practice. The second problem concerns Western Australians − the possibility, perhaps likelihood, that Kintyre will join the list of other poorly rehabilitated, poorly secured uranium exploration sites around Australia.[5]

There is no uncertainty in the short- to medium-term for global nuclear power capacity − the current pattern of stagnation will certainly persist. Cameco's views about a *"very strong and promising growth profile"* in the long term lack credibility.

Cameco's ERMP estimates global nuclear capacity will "reach about 510 gigawatts by 2022 from today's 392 gigawatts, which represents average annual growth of 3%" and that the number of operable reactors will increase from 433 to 524 over the same period.

Current capacity is not 392 GWe, it is 375 GWe (as at 9 January 2014).[6] The projection that capacity will reach 510 GWe by 2022 is absurd.

The International Atomic Energy Agency (IAEA) has downwardly revised its projections repeatedly since the 2011 Fukushima disaster. Its 2012 projection for nuclear capacity in 2030 were reduced by up to 9% from the 2011 projections.[7]

The IAEA's latest forecast (in September 2013) is for growth from the current 375 GWe of global nuclear capacity to 435−722 GWe by 2030; that is, growth of 16−93%. As if to soften the blow of its latest downward revision, the IAEA noted that the latest reduction *"is less than in the two previous years."*[8]

Historically, the IAEA's upper projections have been fanciful, while its low projections also tend to be too high (by 13% on average[9]) but provide a reasonable guide nonetheless. So growth of 16% by 2030 − annual growth of 1% − is about as much as the industry can realistically hope for. Cameco's projection of 3% annual growth, with capacity reaching 510 GWe by 2022, is frankly bizarre.

[4] Environmental Protection Act 1986 http://www.austlii.edu.au/au/legis/wa/consol_act/epa1986295/
[5] For some examples of poorly rehabilitated exploration sites in Australia see http://australianmap.net/category/former-uranium-mine-or-plant/ and http://australianmap.net/overview
[6] http://world-nuclear.org/info/Facts-and-Figures/World-Nuclear-Power-Reactors-and-Uranium-Requirements/
[7] http://www.iaea.org/About/Policy/GC/GC57/GC57Documents/English/gc57-3_en.pdf
[8] http://www.world-nuclear-news.org/NP-IAEA_foresees_continued_growth_in_nuclear_capacity-2509134.html
[9] Calculated from tables 33 and 34, p.56, http://www-pub.iaea.org/mtcd/publications/pdf/pub1304_web.pdf

Explaining its decision to *"significantly lower"* its 2011 nuclear growth projections, the World Nuclear Association stated in September 2013 that: "The lower projected rate of growth of the nuclear sector in the latest edition of the WNA market report (compared with the 2011 edition) reflects the current and expected increased level of challenges facing utilities aiming to commission new nuclear power plants. These challenges are not only a result of the post-Fukushima calls for the industry to demonstrate higher levels of safety, but also the need to cope with stronger competition from alternative generating technologies at a time of more modest power demand growth expectations."[10]

The IAEA and the World Nuclear Association will further reduce their projections when they fully factor in developments over the past year. The most that could be said for the global 2013 figures[11] – four reactors connected to grids, four permanently shut down – is that it was an improvement on the previous year. Nuclear power suffered its biggest ever one-year fall in 2012 – nuclear generation fell 7% from the 2011 figure.[12] Nuclear generation fell in no less than 17 countries, including all of the top five nuclear-generating countries – clearly the industry's problems extend well beyond Japan.[13] Nuclear power accounted for 17% of global electricity generation in 1993 and it has steadily declined to 10% now.[14]

Moreover the pattern of stagnation suggested by the global 2013 figures masks deeper problems and setbacks for the industry. Perhaps the most striking recent developments have been in the United States, where the industry is finding it increasingly difficult to profitably operate existing reactors – especially ageing reactors requiring refurbishments – let alone build new ones. Almost half of the world's reactors have operated for 30 years or more[15], so the problem of ageing reactors is starting to come into sharp focus.

Peter Bradford, a former member of the US Nuclear Regulatory Commission, notes that by 2009, applications for 31 new reactors in the US were pending.[16] *"The 31 proposed reactors are down to four actually being built and a few others lingering on in search of a licence, which is good for 20 years,"* Bradford writes. *"Those four are hopelessly uneconomic but proceed because their state legislatures have committed to finish them as long as a dollar remains to be taken from any electric customer's pocket. Operating reactors are being closed as uneconomic for the first time in 15 years."*

In 2012 alone, US utilities closed or announced plans to close five reactors in addition to cancelled plans for new reactors and cancelled plans to increase the power of existing reactors; Forbes recently listed another six nuclear plants that could be next for the chopping block[17]; and academic Mark Cooper has identified 38 US reactors in a similar situation to those that have recently been shut down.[18] Small comfort that the number of reactors under construction has risen to five.

[10] http://www.world-nuclear-news.org/ENF-Uranium_supply_and_demand_in_balance_for_now-1209137s.html
[11] http://www.world-nuclear-news.org/NP-Steady-state-for-nuclear-in-2013-0701147.html
[12] http://www.world-nuclear-news.org/NN_Nuclear_power_down_in_2012_2006131.html
[13] http://www.worldnuclearreport.org/-2013-.html
[14] http://www.worldnuclearreport.org/-2013-.html
[15] http://www.worldnuclearreport.org/-2013-.html
[16] http://www.guardian.co.uk/environment/2013/jul/11/nuclear-renaissance-power-myth-us
[17] http://www.forbes.com/sites/jeffmcmahon/2013/11/07/6-nuclear-plants-that-may-be-next-to-shut-down/
[18] http://will.illinois.edu/nfs/RenaissanceinReverse7.18.2013.pdf

The UK has finally made some movement towards replacing its fleet of ageing reactors.[19] The capital cost for two planned large reactors (totalling 3.2 gigawatts) at Hinkley Point in Somerset: a staggering $29 billion. Utilities can't find the capital, so the UK government is offering loan guarantees of $18 billion. And the UK government is guaranteeing French utility EDF a staggering 16 cents for every kilowatt-hour generated by the Hinkley Point reactors, fully indexed for inflation, for a staggering 35 years. Economic consulting firm Liberum Capital said "*we are flabbergasted that the UK government has committed future generations of consumers to the costs that will flow from this deal"* and that Hinkley Point will be *"both the most expensive power station in the world and also the plant with the longest construction period."*[20]

EDF plans to build European Pressurized Reactors (EPRs) at Hinkley Point. Two other EPR projects − in Finland and France − have been disastrous. The estimated capital cost for the EPR in Finland has ballooned from $4.5 billion to $12 billion.[21] The estimated cost for the EPR in France has ballooned from $5 billion to $12.8 billion.[22]

While the costs of renewables are falling − and in the case of solar PV, plummeting − nuclear power is subject to a 'negative learning curve'.[23] Economists at Citigroup explain: "The capital cost of nuclear build has actually risen in recent decades in some developed markets, partly due to increased safety expenditure, and due to smaller construction programmes (i.e. lower economies of scale). Moreover the 'fixed cost' nature of nuclear generation in combination with its relatively high price (when back end liabilities are taken into account) also places the technology at a significant disadvantage; utilities are reluctant to enter into a very long term (20+ years of operation, and decades of aftercare provisioning) investment with almost no control over costs post commissioning, with the uncertainty and rates of change currently occurring in the energy mix."[24]

South Korea is one of four countries that is supposedly driving the nuclear renaissance (along with China, India and Russia). However plans to expand nuclear power to 41% of electricity supply by 2035 in South Korea have been reduced to a 29% target[25] in the wake of a major scandal involving bribery and faked safety certificates for thousands of reactor parts[26], and another scandal involving the cover-up of an accident that sent the temperature of a reactor core soaring. One hundred people have been arrested including a former chief executive of Korea Hydro and Nuclear Power (KHNP), a vice president of Korea Electric Power Corp., and a former deputy minister in charge of energy. In September 2013, the chief executive of KHNP issued a public apology, saying *"our domestic nuclear project is facing the utmost crisis"* and noting that public trust has *"hit the ground"* because of the Fukushima disaster and the corruption.[27]

Belgium, Germany, and Switzerland plan to phase out their existing nuclear power programs.[28] In January 2014, the European Commission forecast that EU nuclear generating

[19] www.wiseinternational.org/node/4032
[20] http://www.liberumcapital.com/pdf/ULkWtp00.pdf
[21] http://online.wsj.com/article/BT-CO-20121213-703038.html
[22] http://uk.reuters.com/article/2012/12/04/enel-edf-idUKL5E8N4DIJ20121204
[23] http://reneweconomy.com.au/2012/one-year-after-fukushima-counting-the-cost-of-nuclear-89801
[24] http://www.businessinsider.com.au/5-charts-that-show-nuclear-is-declining-2013-10
[25] http://www.world-nuclear-news.org/NP-Nuclear-to-remain-Korean-mainstay-1012137.html
[26] http://atomicpowerreview.blogspot.com.au/2013/10/south-korea-cables-fail-tests.html
[27] http://www.world-nuclear-news.org/RS-Indictments_for_South_Korea_forgery_scandal-1010137.html
[28] http://www.worldnuclearreport.org/-2013-.html

capacity of 131 GWe in 2010 will decline to 97 GWe in 2025 before rising to 122 GWe in 2050 − still lower than the 2010 figure. The European Commission forecasts that nuclear's share of EU electricity generation will decline from 27% in 2010 to 21% in 2050, while the share held by renewables will increase from 21% to 51.6%, and fossil fuels' share will decline from 52% in 2010 to 27% in 2050.[29]

Russia and China have reduced their projections for nuclear power growth (though significant growth in China still has the potential to mask patterns of stagnation and slow decline elsewhere). Public opposition forced the cancellation last year of a planned nuclear fuel processing plant in China[30] and contributed to the cancellation of a planned power reactor near Kaliningrad in Russia[31] − the first time in both countries that public opposition has stopped nuclear projects.

Canada has abandoned plans for new reactors.[32] The French President has pledged to reduce reliance on nuclear power from 75% to 50% of total electricity generation[33] (though his plan faces opposition). The government of Brazil, the world's fifth most populous country, announced in late 2013 that apart from one reactor already under construction, plans for new reactors have been put on hold indefinitely.[34] The head of Brazil's energy planning agency, Mauricio Tolmasquim, said: *"This is wind power's moment. There's been a revolution in terms of cost."*

South Africa − the only country in Africa with power reactors − abandoned plans for new reactors in 2008, revived them, and then abandoned them again in December 2013.[35] In the Middle East, only Iran has a nuclear power reactor, while Jordan, the United Arab Emirates, Turkey and Saudi Arabia are pursuing nuclear power programs with greater or lesser intent. Meanwhile a swag of countries in the Middle East and North Africa have put nuclear power on the back-burner, including Kuwait, Oman, Qatar, Bahrain, Egypt, Syria, Tunisia, Israel, Morocco, Algeria and Libya.[36]

No reactors are operating in Japan − some will restart in the coming years, but not all, and earlier plans to add at least another 15 reactors to Japan's pre-Fukushima fleet of 55 reactors are dead and buried. The Fukushima disaster will be with us for decades and the economic costs are being counted in the hundreds of billions of dollars. As with the companies currently mining uranium in Australia (ERA, BHP, Heathgate), Cameco turned a blind eye to the widespread corruption and collusion in Japan's nuclear industry − corruption and collusion that led to the Fukushima disaster. The July 2012 report of the Nuclear Accident Independent Investigation Commission − established by an Act of Japan's national parliament − states that the Fukushima disaster was *"a profoundly man-made disaster that could and should have been foreseen and prevented"* if not for *"a multitude of errors and wilful negligence that left the Fukushima plant unprepared for the events of March 11."*[37]

[29] http://www.world-nuclear-news.org/EE-Politics-hold-European-nuclear-steady-0901144.html
[30] http://www.world-nuclear-news.org/ENF_Guangdong_nuclear_fuel_centre_cancelled_1807131.html
[31] http://world-nuclear.org/info/Country-Profiles/Countries-O-S/Russia--Nuclear-Power/
[32] http://www.world-nuclear.org/info/Country-Profiles/Countries-A-F/Canada--Nuclear-Power/
[33] http://www.world-nuclear-news.org/NP-Nuclear_to_fund_French_energy_transition-2309137.html
[34] http://www.reuters.com/article/2013/09/15/us-brazil-nuclear-idUSBRE98E06U20130915
[35] http://analysis.nuclearenergyinsider.com/new-build/south-africa-puts-nuclear-hold
[36] http://www.world-nuclear-news.org/RS_International_links_for_African_nuclear_1809131.html and http://www.worldnuclearreport.org/-2013-.html
[37] http://warp.da.ndl.go.jp/info:ndljp/pid/3856371/naiic.go.jp/en/

Plans for a new nuclear power plant in Taiwan motivated 200,000 people to participate in protests in March 2013[38], led to a physical brawl in Parliament in August[39], and both major parties are promising an eventual phase-out of nuclear power.[40]

A number of other countries have decided since the Fukushima disaster not to engage or re-engage in nuclear programs, including Singapore, Greece, Italy, Peru, Portugal, Thailand, Venezuela, and many others.[41]

The nuclear renaissance is dead. If there is any growth at all in the next 10−20 years, it will fall well short of the significant, sustained growth implied in the term renaissance. Cameco's projection that global nuclear capacity will reach 510 GWe by 2022 is absurd.

Cameco notes that over 60 reactors are (ostensibly) under construction globally but fails to note that[42]:

- Nine reactors have been listed as *"under construction"* for more than 20 years and four additional reactors have been listed for 10 years or more.
- Forty-five projects do not have an official planned start-up date on the IAEA database.
- At least 23 have encountered construction delays, most of them multi-year. For the remaining 43 reactor units, either construction began within the past five years or they have not yet reached projected start-up dates, making it difficult or impossible to assess whether they are on schedule or not.

Uranium demand and supply

Cameco notes that secondary supply is decreasing as a result of the end of the Russian Highly Enriched Uranium (HEU) commercial agreement in 2013 (ERMP Section 2.4). However mine production has met an increasing proportion of demand in recent years − 78% in 2009 and 2010, 85% in 2011 and 86% in 2012 (the shortfall was around 10,000 tonnes of uranium in 2011 and 2012).[43] This suggests that the end of the Megatons to Megawatts program will have a moderate impact. There is scope for weapons material to continue to supply the civil market regardless of future bilateral US-Russian agreements.[44] Ux Consulting noted last year that reduction in demand stemming from the Fukushima accident *"essentially negates much of the reduction in supply resulting from the end of the US-Russia HEU deal".*[45] Utilities have built up uranium stockpiles in recent years as a result of low uranium prices (the World Nuclear Association estimated commercial inventories totalling 145,000 tonnes of uranium in 2010 − enough to supply global demand for two years).[46]

Cameco itself, citing the World Nuclear Association, believes that just 65% of future demand will be met by mines with a range of secondary sources providing 35% − stockpiles; recycled

[38] http://www.chinapost.com.tw/taiwan/national/national-news/2013/03/10/372647/Up-to.htm
[39] http://www.world-nuclear-news.org/NP-Taiwanese_nuclear_vote_turns_violent-0208135.html
[40] http://www.world-nuclear-news.org/NP-New_nuclear_energy_policy_for_Taiwan-0311117.html
[41] http://www.worldnuclearreport.org/-2013-.html
[42] http://www.worldnuclearreport.org/World-Nuclear-Report-2013.html
[43] www.world-nuclear.org/info/Nuclear-Fuel-Cycle/Mining-of-Uranium/World-Uranium-Mining-Production
[44] www.mineweb.com/mineweb/content/en/mineweb-uranium?oid=175742&sn=Detail
[45] www.uxc.com/products/rpt_usa.aspx
[46] www.wna-symposium.org/pdf/2011_Fuel_Market_Report_Summary.pdf

uranium and plutonium from spent nuclear fuel; re-enriched uranium tails; and decommissioned weapons-grade uranium and plutonium. (ERMP, Section 5)

Cameco expects world uranium consumption to grow at about 3% annually (in line with growth in nuclear power capacity) and to reach about 104,000 tonnes per year by 2021 (ERMP Section 5). Those expectations are implausible.

John Borshoff, head of Australian-based uranium miner Paladin Energy, noted[47] in July 2013 that Australia's uranium industry *"is definitely in crisis"*. In January 2014 John Borshoff declared that uranium mining is *"unsustainable at the moment,"* and that "*Everyone has declared a moratorium on new projects."*[48]Kazakhstan, the world's biggest producer of uranium, has suspended all projects to increase output due to the protracted price slump. *"We've put the brakes on implementing uranium output expansion*s," said Vladimir Shkolnik, CEO of state-owned producer Kazatomprom.[49] Russian nuclear giant Rosatom is freezing uranium expansion projects in Russia and elsewhere due to low prices; the first casualty is the Honeymoon ISL mine in South Australia.[50]

Bloomberg reported in September 2012 that Cameco itself was selling some of its output below the cost of production, and that the Kintyre project would need a $67 uranium price to be economical.[51]

It is clear then, that Cameco's projections for growth in uranium demand are at best flawed, and that its project justification and rationale is baseless.

4. INSUFFICIENT AND INCONSISTENT DATA

Throughout the ERMP Volume one, Volume two and additional Appendices there are a huge number of inconsistencies in data and figures and assumptions on volume, time and distance. This information forms the basis for many calculations and conclusions. The inconsistencies, in particular where they relate to volumes of radioactive ore or waste rock, raise concerns about the company's ability to monitor and manage or provide reliable data. The inconsistency of information also highlights the need for full detail on schedules and management plans, which have not been provided. There are examples of these inconsistencies identified throughout this submission.

There is a number of incomplete management plans, or management plans that are drafts or conceptual plans. Studies and data that are relevant or referred to are not present. Significant environmental aspects of the project have not yet been considered.
The insufficient information and inconsistencies in the ERMP are either accidental or deliberate. If accidental this would imply a level of incompetency that cannot be accepted from potential uranium miners. If deliberate, then there are some serious questions around

[47] http://www.theaustralian.com.au/business/mining-energy/uranium-industry-facing-volatility-paladin-md-john-borshoff/story-e6frg9df-1226680989121
[48] http://au.news.yahoo.com/thewest/business/wa/a/20739113/paladin-in-no-rush-for-sale/
[49] www.wise-uranium.org/umopasi.html#KZ and www.wise-uranium.org/upkz.html
[50] http://money.msn.com/business-news/article.aspx?feed=OBR&date=20131113&id=17102011
[51] http://www.thestarphoenix.com/business/Uranium+outlook+bleak/7270345/story.html

the corporate behaviour and integrity of this company. Either way these issues should not be taken lightly; there are important water ways, a National Park, a national heritage site and many endangered and vulnerable species at stake. There is little room for error. The stakes are high and the risks very long term. Again, we maintain that approval for the Kintyre Uranium Project should not be granted.

5. BIODIVERSITY - FLORA AND FAUNA, BUSH TUCKER & SUBTERRANEAN FAUNA

There are many questions about how the surveys and data collection occurred, how new information and old information have been reconciled, what the overall methodology was for establishing a baseline understanding of flora and fauna. Flora and fauna surveys are a vital aspect of pre mining activity to establish the necessary information for which to base a mine closure and rehabilitation plan. We are concerned that the flora and fauna studies alluded to, and those present in the ERMP are not a complete or comprehensive assessment.

It also appears that there have been no attempts to document background radiological uptake in flora and fauna, opportunistically or otherwise. There is no mention of flora and fauna in the radiological management plan and no figures on radiation in the reports on flora and fauna.

The Kintyre area is in a transition zone of the Great Sandy Desert and the Little Sandy Desert, it is on the boundary of (and should still be included in) the Karlamilyi National Park. Kintyre lies between two branches of the ephemeral Yantakuji creek that make up that flows into Coolbro creek which flows east back into the National Park and Lake Dora where Punmu get their drinking water from (see Appendix 3). Kintyre is part of a catchment area for an astonishing arid river system. The diversity of flora and fauna the location and natural features all make Kintyre a significant and unique part of the region.

Flora:

In section 8.5.3 Proponent Studies and Investigations Cameco stated that: ***"A summary of the flora and vegetation of the Project area is presented in Bennett Environmental Consulting (2011a) and (2011b) (Appendix L)."*** The report mentioned is in fact a study of flora almost entirely outside the project area. There is mention of additional studies in section 8 of the ERMP indicating other studies may have been completed within the project area but the information, evidence and or data has not been included in the appendices. Cameco has included choice lines, phrases and sections from the consultants' report but has not provided the evidence, methodology or the data for public review. Cameco has avoided public scrutiny on this significant environmental factor of the project in a highly ecologically sensitive area. We have no confidence in the integrity of the studies given there is no data available on the flora, no methodology on the collection of data and no possibility of public review of the data.

Within the ERMP there are descriptions of the frequency and diversity of vegetation and it is suggested that this may be within the project area but these sections refer to ERMP Appendix L - the study that was conducted entirely outside the project area.

For example 8.5.3 ***"The project area has been extensively surveyed as summarised in table 8-8. A summary of the flora and vegetation on the project is presented in Bennett Environmental Consulting (2011a) and (2011b) (ERMP Appendix L)."***

Table 8-8 lists a number of flora and vegetation studies and surveys. There is one study conducted between 1994 and 1997 a quick online search confirmed that this document is not publicly available, and as mentioned above, it is not included in the appendices.

In section 8.5.4 ***"The key vegetation units mapped within the Project area by Hart Simpson & Associates 1997 are shown in Figure 8-9."*** Here there is a list of species but no detail on frequency, location within the project area or any other relevant data. This does not meet public expectations on transparency. These studies are also 16 + years old, making them out dated. The lack of detail on any more recent studies also evades issues and concerns about impact on the flora and vegetation at the project area through exploration works. Conservation Council has appealed recent clearing permits by Cameco at the Kintyre site due to concerns about over clearing and lack of detail on any data on impact or clear evidence of monitoring. See Appendix 4 and 5.

Appendix L is referred to again in section 8.5.4: ***"A total of 49 vascular plant families, 155 genera and 348 taxa (species, subspecies and varieties) were recorded during the surveys the most dominant of which were the Poaceae (grass family) and Fabaceae (pea family) and Malvaceae families (Appendix L)."*** As noted above, this study was undertaken completely outside the project area but Cameco do not describe the area they are talking about.

There is an unacceptable lack of detail on the diversity and frequency of flora within the project area.

Fauna:

Of the 96 reptile species, 132 bird species, 29 native mammal species, eight introduced species and another eight identified in owl scats, Cameco has only made detailed comments on 28 of these species - all of which are significant fauna. They have undermined the value and ignored any impacts of the other 245 species. They have not written in any commitments to the protection of the other 245 species. Like any ecological system a diversity of flora and fauna is important to support its function. There is no discussion on the ecological balance or the importance of diversity. There is no indication that Cameco has assessed the biological system as a whole and in the ERMP they make no commitment to maintain or protect it.

There are a number of priority, vulnerable, endangered and critically endangered fauna species that have been identified and recorded within the project area.

Within the Management Plans and the four separate fauna survey reports in the Appendix there is no clear explanation of where these surveys took place. The only clear identification of a species and its location inside the project area is of two scorpion species. There is no comprehensive information on where animals or their burrows were found. Survey maps and discussion on fauna do not correlate. Cameco assert that *"comprehensive flora and vegetation studies have been undertaken in the Kintyre area between 1986 and 2012"* - there is only one study, the Hart Simpson and Associates Pty Ltd 1986-1992, which clearly indicate studies took place inside the project area, but are over 20 years old and have not been made publicly available for review.

The Mulgara, Bilby and Rock Wallaby studies seem to have occurred outside the project area – near the Northern Bore and along the Haulage road. We lack confidence that detailed flora and fauna studies have been conducted inside the project area.

Despite the low quality maps, the poor understanding of many of the species, the data without evidence, the lack of clarity around what species were surveyed within the project area as opposed to adjacent to, along the haulage road or within the region, there is unmistakably a high diversity of vulnerable, endangered and critically endangered fauna species that are put at risk by this project.

We are not confident that Cameco can mitigate impacts to the threatened species in the project area, the adjoining areas of the Karlamilyi National park and other surrounding areas. Multiple times within the ERMP Cameco has stated *"This is a very poorly understood species"* followed by statements like *"this species is not expected to be impacted by the project".* Cameco cannot assert that a species that they don't understand will or will not be impacted by the project.

While Cameco has identified the 28 vulnerable, endangered, critically endangered and priority species it has failed to acknowledge the seriousness of the level of protection that is required for these species under the Environment Protection and Biodiversity Conservation Act 1999 Section 18 and 18A. For example, the EPBC Act section 18 states that with respect to a critically endangered species, an endangered species or a vulnerable species:
A person must not take an action that:
a) has or will have a significant impact on a listed threatened species included in the critically endangered category; or
b) is likely to have a significant impact on a listed threatened species included in the critically endangered/ endangered/ vulnerable category.

Equally for an critically endangered community or endangered community

A person must not take an action that:
(a) has or will have a significant impact on a listed threatened ecological community included in the critically endangered category; or
(b) is likely to have a significant impact on a listed threatened ecological community included in the critically endangered / endangered category.

In Section 18A of the EPBC ACT Offences relating to threatened species etc. it states that
(1) A person is guilty of an offence if:

(a) the person takes an action; and
(b) the action results or will result in a significant impact on:
(i) a species; or
(ii) an ecological community; and
(c) the species is a listed threatened species, or the community is a listed threatened ecological community.

It is not only irresponsible, but also essentially illegal to impact on these species and communities. The ERMP is the sole document by which this aspect of the project and its impacts will be assessed by the State and Federal agencies responsible for enforcing this Act. Given these two factors the Environmental Management Plan set out in ERMP Appendix D10 is inadequate and unclear.

Cameco has not adequately identified the full range of threats or made attempts to identify and discredit threats that the project may have on fauna. Cameco has not included threats such as radiation, dust, and noise and water pollution/contamination. There is a very serious risk of bioaccumulation of radiation through dust and water which could significantly impact on flora and fauna.

ERMP Appendix D10 6.4 Conservation Significant Fauna – Management Strategy – includes a plan to report any significant deceased animal to the DPaW. This should be extended to any animal found dead in the project area to be examined for cause of death; this information should also be made publicly available. Fauna can act as an environmental indicator, if there is an unexplained death this could indicate some leak or issue with contamination in the project area.

Bush Tucker:
There is no clear identification in the Fauna Management Plan about the particular species present in the project area or its surrounds that are also commonly hunted for food. These include the Bush Turkey, Kangaroo and Emu. There has not been an assessment of these species' behaviour or movement – the likelihood of their presence or frequency of visiting areas with radiation exposure risks, the risk or likelihood of the radiation uptake or the very real possibility that those animals may then be hunted for food.

The only mention of bush tucker as an issue is in section 9.1.5.2. It was raised during consultation. Cameco then make a commitment to manage the project so that bush tucker is not affected by radiation. There is no evidence that Cameco has identified which fauna is hunted for food, there is no correlating section within the management plans that mentions the protection of this fauna or of monitoring of dust and radiation, water and contamination in relation to impacts of fauna or bush tucker.

Subterranean Fauna:
The Subterranean Fauna Report (ERMP Appendix N) included clear evidence of studies conducted within the project site, clear methodology, good literature review and background on the topic, unlike the flora and fauna studies.

There are some concerns about the efforts to protect the four Stygofauna species that *"are 'localised' within the proposed drawdown cone. These are three copepods Nitocrella sp. B04 (nr obesa), Nitocrella sp. B05 and Parastenocaris sp. B07 and one syncarid Atopobathynella sp. (Figure 5.4)"* ERMP Appendix N.

The possibility of extinction of these four Stygofauna is a real risk given that they *"are not known to occur elsewhere and mining poses potential conservation risks for these species."* The consultant's report highlights the risk of extinction in general for short range endemic species like the Nitocrella sp. BO4 and sp. B05 and the Parastenocaris sp. B07 and Atopobathynella sp.

There is inconsistency on the estimated pit disturbance area. Cameco claim that it will be 75ha. The consultants claim it will be 85ha. It is yet another inconsistency in the ERMP. This inspires little confidence in the protection of subterranean fauna when discussing the impact of the 'drawdown cone' on the possible extinction of four Stygofauna and with respect to the impact area for the Troglofauna Noctoicola sp. which has only been found within the pit area.

Current EPA review of Stygofauna management:
The EPA is currently undergoing a review of their position on subterranean fauna, this is an appropriate move towards the more effective protection of Stygofauna which to date has been sadly ineffective. The Conservation Council of WA met with the EPA to discuss this review on 5 October 2011, we have also engaged in the redrafting of guidelines and worked with the EPA and other academics and leaders in the field during the public consultation on the draft guidelines. In these discussions we have consistently raised the following issues:

- The general ineffectiveness of current monitoring programs and documentation and assessment of the impact on subterranean populations
- Lack of independent and peer reviewed studies through assessments of projects
- Limited understanding about the impacts on populations and species
- Documenting and verifying the occurrence of species outside the footprint of development
- Information standardisation

6. WATER

Surface Water:
Cameco suggests that it will conduct a baseline gamma survey of the project area and the downstream Yantakuji creek. These baseline studies should have been done at the earliest possible stage and followed up with ongoing monitoring. They should also include upstream studies in the National Park to identify any variation from upstream of the project site to downstream. These should have been conducted before exploration and mining.

In a paper written for the Native Title Conference 2012 titled ***Talking About Kintyre (see Appendix 3)*** *t*here is a section which talks about the revision of an educational DVD made about the Kintyre project. The DVD contained information about surface water. In the first

draft of the DVD it was claimed that during flooding or heavy rains surface water all drains to the north of the project area. On review of the DVD by stakeholders this section of the DVD was contested: ***"some Martu said the section of the DVD about surface water flow from the mine was incorrect"*** (see Appendix 3 - pg 18). The report states that ***"the Martu elders were adamant that during big floods, water from Coolbro Creek flows to Lake Dora.... that in flood time's water from the proposed mine would flow into Rudall River then Lake Dora."***

The conference paper discusses how the collaborative project was a forum in which these issues were raised and that Cameco staff then accepted the local knowledge and amended the DVD to incorporate the local information about the surface water flows from the project. The new information about surface water in the DVD shows that surface water flows initially go north but then track southward back into the National Park, join with the Rudall River and then flow into Lake Dora.

While that process was useful and achieved a good outcome at the time, it is disappointing that Cameco has not presented the same information about surface water flows in the ERMP or used this evidence in their management plans. It is disappointing that Cameco has sidelined the valuable traditional and local knowledge about the movement of surface water. It is also disappointing that they evaded a very serious environmental issue and risk to the National Park and the drinking water of the Punmu community in doing so.

While Cameco has made reference to the knowledge of Aboriginal elders in ERMP Section 7 Pg 109 they have made contradicting statements elsewhere in the report *"There is anecdotal evidence from Aboriginal elders suggesting that in years of significant flood events the discharge from Coolbro Creek ultimately flows along sand dunes in an easterly direction towards Rudall River. This is supported by contour data and landforms in particular the presence of claypans suggesting inundation of these areas."*

Cameco has used this statement to describe the surface water flows in the business end of the report: *"The drainage in the upper reaches of the creeks occurs within relatively incised channels which widen to include significant flood plain storage in the area surrounding the Project area. The tributaries converge immediately downstream of the project site and flow north to the Coolbro Creek. Coolbro Creek then follows an easterly path into the Great Sandy Desert where the drainage eventually dissipates into the sandy environment"* ERMP Appendix I Surface Hydrology Report.

At the beginning of this same Hydrology Report provided in ERMP Appendix I the consultants make this statement: *"Due to the remote nature of the Kintyre site and the corresponding* ***lack of hydrological data, particularly the absence of any historic data from large floods,*** *the approach to assessing the potential nature and extent of flooding has relied on the development and interpretation of mathematical computer models."*

While the consultant has acknowledged the limitation of their understanding of surface water flows Martu have been clear. There is an abundance of local knowledge about the movement of surface water that Cameco has in fact acknowledged. Cameco's information on management of surface water, mitigating the release of polluted water and the

environmental impacts on the National Park, Rudall River and Lake Dora should be discounted based on the lack of certainty around the flow of surface water from Coolbro Creek and lack of understanding on which surface water flow they are basing their management plan.

We recommend that Cameco reassess the surface water flow based on local knowledge about the movement of surface water and identify risks associated with the movement of surface water back into the National Park and Lake Dora and write a corresponding management plan to mitigate those risks. This should be made available for public review and comment.

This would also involve conducting baseline studies on radiological environments with which to measure change in the environment by. This would include monitoring of the eastern branches of Rudall River, Lake Dora and the natural springs at Lake Dora and Punmu's water supply.

7. PROCESSING

The areas of the ERMP detailing the processing of uranium ore have a number of inconsistencies. Cameco has stated they need a significant amount of acids for processing which raises serious concern about neutralising the acids and potential for Acid Metalliferous Drainage or Acid Mine Drainage (AMD). The inconstancies are sloppy and unacceptable. The lack of information and consideration on AMD is negligent and poses a serious and expensive risk to the environment.

"Fg 6.11 shows 4Mt of ore and 1Mt of low grade ore being processed. Assuming 0.49% resource grade, this gives 19.5kt U_3O_8 contained in the ore. At a typical 90% recovery this gives 17.6kt of U_3O_8 produced. The 1Mt of low grade ore, assuming a grade of 0.1% U_3O_8 after radiometric sorting and 90% recovery, gives 0.9kt U_3O_8. A total of 18.5kt of U_3O_8 some 2.5kt less than the 21kt that Cameco suggest in the ERMP. This raises concerns about the accuracy of similar figures throughout the report. This highlights the need for full detail on schedules and management plans." (See Appendix 6)

Ranger uranium mine uses 14.5 tonnes of sulphuric acid per tonne of U_3O_8. Cameco propose to use almost double the amount of sulphuric acid - 27 tonnes - at Kintyre. The figures are based on information in Table 6.7 of the ERMP which states 111,000 tonnes of sulphuric acid will be used to produce approximately 4,000 tonnes U_3O_8 per year, i.e. 111,000 divided by 4,000 tonnes = 27 tonnes sulphuric acid per tonne of U_3O_8. (See Appendix 6)

Cameco propose to use less lime at Kintyre than is used at Ranger. The high use of acid and small use of lime raises concerns about the ability of Cameco to neutralise the acids in the tailings. This is important because of the potential for AMD.

There is no data on the expected level of the pH in the tailings. There is no reference to an AMD risk from tailings. There is scarcely a mention of AMD in the entire ERMP. There is mention of AMD in sections relating to geochemistry where the risk of AMD is confined to a

discussion on the small amount of sulphides in the rock and ore. This oversight of the large quantity of sulphuric acids used in processing and any discussion about AMD risk is significant. AMD poses a significant environmental impact from mining and in the Australian context has been a regular feature of closed uranium mines.

We recommend that there is further information provided to the EPA, the Federal Department of Environment and the public on the expected pH levels of tailings and management plans and research in the effective neutralisation of acids from processing that would be stored as tailings.

8. RADIOACTIVE MINE WASTE - TAILINGS

There is in fact no tailings management plan included in the ERMP. There is a brief outline of the tailings management facility in section six of the ERMP, and two technical reports on design. There is no management plan with discussion on the risks, mitigation of those risks, modelling of how long the tailings management facility structure will maintain its function and integrity, or how long Cameco will be responsible for maintaining the tailings. There is an indication that Cameco propose to cap the tailings and leave them as they are, but it is unclear exactly how Cameco plan to manage the tailings post closure.

There is the occasional mention of tailings management in ERMP Appendix D in reference to other Management Plans and as one of the key reoccurring environmental risks – to flora and fauna and surface water. There is some discussion on the fibrous material management plan about the potential of asbestiform in the tailings. There is some discussion in the Conceptual Mine Closure Plan about the risk of tailings, yet there is no comprehensive or even conceptual tailings management plan provided.

A tailings management facility is perhaps the single most environmentally significant aspect of a uranium mine and there is no management plan included in Cameco's ERMP. This means the management will not be assessed by EPA or approved by the Environment Minister or reviewed by the public. This process for such an environmentally significant aspect of the project is unacceptable.

The EPA has powers to enforce environmental compliance on projects and conditions approved by the Environment Minister. The Department of Mines and Petroleum will be assessing the Tailings Management Plan but will do so without any legislative powers to enforce the environmental conditions, as there is not heads of power for this in the Mining Act 1978.

Review of the current information available on the TMF through the body of the ERMP and in Appendix E has raised the following concerns:

- There are no details on how Cameco intend to neutralise chemical usage, in particular pH
- There are no details on slurry solids content i.e. is it 50% or 60% solids in the slurry?
- The tailings dam is stated to hold 7Mt compared to project total of 5Mt shown in Fig 6.11 allowing for the processing of mineralised overburden. There is no estimate of

how may Mt of tailings could be produced from the mineralised overburden. There is little evidence around the tailings capacity and future opportunistic production and increase volume of tailings.

- There is no reference or investigation on regional cyclonic and storm activity and the potential impact on the TMF. References for cyclonic activity are outdated - Dames & Moore, 1990; 1998.
- There is no demonstration that a 1m freeboard is sufficient to deal with extreme storm risk.
- ERMP Appendix E - Tetra Tech identified that there is a risk of failure of drainage control and a risk to surface water. See above the concerns we have about the modelling of surface water flows.
- There are no specific criteria or values for deciding on water management, especially with respect to levels of water on the tailings and water quality criteria.
- In ERMP Appendix E, Tetra Tech has provided some explanation of modelling and seepage from tailings in normal, wet and dry conditions. Wet conditions double the amount of seepage. There is no discussion about future rainfall and impacts on seepage and no discussion on the integrity of the system and future seepage rates, in 10 years, 20 years, 100 years, 500 years, etc up to 10,000 years.

Expectations on tailings and mine closure:

On Wednesday, 23 May 2012 the WA Parliament passed a motion to address the long term risk of radioactive mine waste - tailings in the environment. The motion was passed with the support of Liberal and Greens Parliamentarians of the day. (Please note that Labor didn't support this motion - they argued that this requirement was not sufficient for safe management of radioactive mine tailings – their evaluation is that there is no safe way to store this material).

The motion reads:

That this house recommends, should the government proceed with its intention to license uranium mining in Western Australia, the government adopt the equivalent or better environmental management regulatory requirements for any future uranium mine in Western Australia as exists under commonwealth and Northern Territory legislation for the operation of the Ranger uranium mine in the Northern Territory with regard to the disposal of radioactive tailings, including the requirements that -

(a) the tailings are physically isolated from the environment for at least 10 000 years; and
(b) any contaminants arising from the tailings do not result in any detrimental environmental impacts for at least 10 000 years.

This standard is similar to the standard enshrined in the Northern Territory Atomic Energy Act 1953 for the Ranger uranium mine. This standard should ensure physical chemical and biological isolation from the surrounding ecosystems for at least 10,000 years. This motion reflects the public and Government's expectation on how this industry should operate, in the unfortunate event that uranium mines are pursued. The reality is that no uranium mine has been able to achieve chemical and biological isolation of radioactive materials even during operation of uranium mining. For example two operating uranium mines in Australia with similar processing and tailings storage as proposed by Cameco at the Kintyre site have

both been unable to contain tailings.

Ranger, Rio Tinto/ Energy Resources Australia, Kakadu NT:

- *"approximately 2000 cubic metres of tailings water (process water) had leaked from a pipe in the Tailings Dam Corridor of the Ranger site between late December 1999 and 5 April 2000"* - Investigation of tailings water leak at the Ranger uranium mine – Office of the Supervising Scientist 2000.[52]
- *"Alan Hughes, the Commonwealth supervising scientist appointed to monitor the mine's environmental impact, confirmed at a Senate committee hearing that about 100 cubic metres a day — the equivalent of 100,000 litres or three petrol tankers — of contaminant were leaking from the mine's tailings dam into rock fissures beneath Kakadu."*[53] The Age – Polluted water leaking into Kakadu from uranium mine. March 13 2009, Lindsay Murdoch.
- In 2011 the Ranger uranium mine closure was extended due to heavy rains and the potential for the tailings dam to overflow.[54]

Olympic Dam, BHP Billiton, Roxby Downs SA:[55]

- 14 March 2012 - Approximately 150 m^3 of tailings slurry leaked from slurry line 3 as a result of failure of one of the flexible joints in the slurry line SA Government DMITRE.
- 1st May 2011 - Approximately 180 m^3 of acidic tailings slurry was released from slurry line 2 at Tailings Disposals as a result of the premature failure of a rubber sleeve on a pinch valve.
- 30th September 2009 - A small leak developed in tailings line 1 adjacent to the northeast corner of Evaporation Pond 2 resulting in tailings slurry spray outside the pipeline corridor onto a nearby undisturbed dune
- 3rd February 2009 - A spill of approximately 250m^3 of tailings occurred when a tailings line failed causing tailings slurry to spray onto southern wall of Tailings Cell 4.
- 10th December 2008 - Approximately 80m^3 of tailings leach tank feed discharged into a bunded area causing 50m^3 of material to overflow into the processing plant area.
- 20th March 2008 - Approximately 70m^3 of tailings escaped into the tailings pipeline corridor from a pipe failure. The process was shutdown and repairs carried out.
- 18th March 2008 - Approximately 270m^3 of tailings escaped into the tailings pipeline corridor from a pipe failure. The process was shutdown and repairs carried out.
- Many more incidents with tailings and leaks are recorded at the Department of Manufacturing, Innovation, Trade, Resources and Energy website: Olympic Dam incident report.

To date in Australia there has not been a uranium mine which has been successfully rehabilitated to the point where radiation at the site is either at typical background levels or no higher than pre-mining levels. We expect both a commitment and the demonstration of a matching financial and technical capacity from Cameco to undertake ongoing monitoring

[52] http://www.environment.gov.au/resource/investigation-tailings-water-leak-ranger-uranium-mine
[53] http://www.theage.com.au/national/polluted-water-leaking-into-kakadu-from-uranium-mine-20090312-8whw.html
[54] http://www.world-nuclear-news.org/ENF-Ranger_suspension_extended_as_rains_continue-1204117.html
[55] http://www.minerals.dmitre.sa.gov.au/mines__and__developing_projects/approved_mines/olympic_dam/olympic_dam_incident_summary_2003_-_2012

until the tailings have demonstrated long term physical, chemical, biological and radiological stability and pose absolutely no risk to the environment for a period no less than 10,000 years. This is in line with the precautionary principle and intergenerational equity which Cameco claims to adopt as underlying environmental principles. We also expect that this is done in view of complying with the 10,000 year standard for isolation of tailings from the environment and that corporate responsibility over the site is not relinquished.

9. WASTE ROCK

Waste rock management makes up a significant section in the draft Radiation Management Plan (which of course is just an outline – with Cameco proposing to develop and submit a proper Management Plan after this public process).

There are some factors of waste rock management that are not detailed in this draft but we consider important for the development of future management plans. As mentioned multiple times in this submission we would like to be involved in a public review of the Radiation Management Plan and other subsequent management plans.

In the ERMP Appendix D2 Radiation Management Plan there is a brief mention of leachate ***"in an area that would be prepared to manage any potential rainfall infiltration and leachate"*** but there are no technical details of how they intend to manage this.

Also in the ERMP Appendix D2 Radiation Management Plan Cameco state that: *"the stockpile area would be constructed with a compacted base to* ***minimise seepage to ground water*** *and engineered drainage to capture runoff."* There is no technical description of how the drainage system will be designed to stop run off except for the broad description of a 'compacted base'. The goal Cameco has outlined here is to 'minimise seepage to ground water'. There should be much more detail on the potential radiological content and volume of seepage. The goal to 'minimise' rather than 'prevent' is unacceptable.

ERMP Appendix D2 - *"****proposed design would have*** *adequate factors of safety to ensure its stability in the long-term."* Section six 6.4 "During the detailed design phase, **Cameco will design** a fit-for-purpose drainage controls in the design..." these are yet more plans and designs that will avoid public review, more technical data that has not been provided in this report.

There is no clear design for the waste rock land form and no real technical studies. There are commitments to do designs with consideration to drainage, and stability. From the basic description of waste rock formations we don't feel there is an adequate commitment around environmental protection and radiation controls. Minimising seepage is not a strong commitment and an underwhelming goal to have. Mediocrity in uranium mines is not acceptable. Cameco should be striving for no seepage of radiation into the groundwater. At least that is the public's expectation.

10. DUST

Dust is a significant environmental aspect of the project as it acts as a pathway, or carrier of radiation. It also can hinder photosynthesis and the growth of vegetation, though this is more of an issue along roads where there is regular dust deposition. There are serious shortfalls in the background studies on dust, future management plans and monitoring programs. These are outlined below.

There is no data provided in the ERMP on wind charts. There are claims made about the predominant wind direction, some measurements are provided but there is no evidence or studies included or references to where these measurements came from.

There is no evidence of monitoring or data gathering outside the project area. The spread of dust outside the project area will be an important factor in monitoring radiation spread. Given the close proximity of the project to the National Park and the high environmental significance of the area there should be dust monitoring inside the National Park.

We know that dust can travel extraordinary distances. In 2009 there was a dust storm over eastern Australia that started on the 22nd September and continued to spread over the following days. On the 23rd it was recorded that the dust has spread 500km in width and 1000km in length. By the 24th of September the plume covered 3,450km.[56]

In section Seven - Regional Overview - Cameco outline that the *"project area could experience dust storms as a result of strong winds following drought conditions."* They go on to undermine the risk by siting a study from 1984 which looks at the frequency of dust storms. This study, like many others that Cameco refer to, is outdated.

Cameco concede that dust storms pose a radiological risk (Section 7.6.4 pg 113) and refer us to the Dust Management Plan in ERMP Appendix D5. In a massive omission the Dust Management Plan does not mention Dust Storms once. There is no description of what a dust storm is - the threat, the actions Cameco will take to mitigate the risk of a dust storm or the impact of one. It is as though dust storms do not exist. It is a massive oversight within the ERMP. Undoubtedly dust storms would be incredibly difficult to manage, and another reason why we should not have a uranium mine at Kintyre. That Cameco has not sought to address this issue implies it has no solution to manage it.

The risk is that a dust storm or a strong wind could distribute dust, with radioactive particles, long distances from the mine site. A strong South Westerly could transport dust from the mine site to Punmu or Kunawaritji. Equally if there was a North Westerly it is possible that dust could travel to Parnngurr. A North Easterly could see dust end up at Jigalong, and a South Easterly could send dust to Nullagine. There is no comment on the potential for dust to reach these communities and no suggestion of dust monitoring in these communities. We have no evidence that Cameco has considered these risks, can manage them or intend to.

[56] "Dust over Eastern Australia". NASA - Earth Observatory. 25th September 2009. http://web.archive.org/web/20091030024037/http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=40302

The dust monitoring program outlined in 5.6.2 of the Dust Management Plan does not actually give any detail on how, where or what will be monitored. It describes the technology to be used, and the accredited monitoring 'Standards'. The four different 'Standards' mentioned outline various methods, but they are not provided for our review - and they cost around $170 each to purchase online. It is unrealistic for the public to review these. So with a lack of any publicly available methodology we cannot make comment. However we can say that we have expectations that there is regular monitoring outside the project area.

We are concerned that if monitoring is not done within the National park at Punmu, Parnngurr, Jigalong, Nullagine and Kunawaritji then dust particles with radioactive particles will not be detected. Without monitoring and baseline data we cannot be sure of the impact of the mine on surrounding areas of environmental significance or on communities. Any later identified impacts will need the evidence or a monitoring program and base line study to make the company accountable for remediating those sites. There should be no expense spared to ensure these communities have the means to detect radiation in dust, for peace of mind and for corporate accountability. Equally no expense should be spared to ensure that the National Park is not impacted on by the proposed mine.

11. ENERGY CONSUMPTION AND GREENHOUSE EMISSIONS

Kintyre would produce 29.5 tonnes of $C0_2$ per tonne of U_30_8. For production of 4,000 tonnes of U_3O_8, 118,100 tonnes of CO_2 would be emitted - nearly double the rate of CO_2 emissions from Ranger which produces 16.1t CO_2 per tonne of U_30_8.[57] On average a uranium mine produces 27 tonnes $C0_2$ per tonne of U_30_8.[58] This is a high energy proposal and likely to be higher than 29.5 tonnes.

A large portion of the expected $C0_2$ from the project is from diesel in product transport from the proposed mine site to Port Adelaide for export. In the Tetra tech report – ERMP Appendix Q Greenhouse Gas Report – pg. 16 Tetra tech account for the transport of product to port at a distance of 3,900km. Other sections of the ERMP refer to the distance as 4,600km. While the CO_2 emissions prediction from the project is an estimate – there are some flaws in the baseline information being used to make the estimate. This means that the $C0_2$ emissions from the project are likely to be more than 29.5 tonnes per tonne of U_30_8.

12. CLOSURE AND REHABILITATION

There are a number of issues with the conceptual mine closure plan:

[57] The future of Yellowcake: A global assessment of uranium resources and mining *Science of The Total Environment*, *Volume 472*, *15 February 2014*, *Pages 590-607*

[58] Dr Gavin Mudd "The Sustainability of Mining in Australia – Key production Trends and their Environmental Implications. http://civil.eng.monash.edu.au/about/staff/muddpersonal/rr5

- Lack of opportunity for future public engagement on the actual mine closure plan which is yet to be developed
- Lack of detailed baseline studies on flora and fauna within the project area
- Lack of radiological monitoring programs for water and dust outside the project area
- Cameco has conceded there will be seepage from the tailings and the waste rock – with radiation
- There is no consideration of Acid Metalliferous Drainage from processing or tailings
- The long term integrity of the pit and contamination pathways from the pit lake to the south branch of the Yantikuji creek
- The expected mine closure period is 10 years, there is no discussion on the State Governments position that tailings must be isolated from the environment for no less that 10,000 years
- There is no mechanism for the Mining Rehabilitation Fund or for Ministerial intervention to apply a bond which is critical to ensuring corporate responsibility over the mining legacy risk
- Radiation and public access to the site

Public Engagement & Transparency:
Mine closure is a significant aspect of any mining, but uranium mining poses an ongoing environmental and public health risk well into the future, in-fact not less than 10,000 years. A public engagement process on mine closure is vital. There are no legislative requirements to engage on mine closure plans so we urge the EPA and DMP to advocate for public engagement and transparency on mine closure plans.

The DMP's own Uranium Advisory Group identified that WA regulations are lacking in transparency- this is a perfect example of the lack of transparency and integrity of the public consultation period. The public are invited to read thousands of pages of incomplete and conceptual plans without detail on how they will actually achieve their promises that the industry, historically, have failed to deliver on. There is zero confidence that uranium companies can meet these targets – exacerbated by the lack of information and detail in public documents.

In the Conceptual Mine Closure Plan Section 5 there is a list of stakeholders for future consultation when a mine closure plan has been developed. The Conservation Council and other Environmental NGO's have not been included in this.

CCWA is the state's peak environmental group representing over 100 local environment groups. We are a stakeholder for this project and have been engaged with the company on numerous occasions. We have been engaged with the Department of Mines and Petroleum on the general issues of mine closure and the specific issues of uranium mining and mine closure. We have actively engaged in the Kintyre proposal from the earliest stage when Cameco referred the project. We appealed the level of assessment and made a submission on the Scoping Document, we have also engaged on clearing permits at the exploration projects. We have put considerable time and energy we into engaging in this proposal and have a lot of informed and well constructed input to give to the process. We have an expectation that we should be included in future consultation on the Kintyre uranium mine

proposal and particularly on mine closure.

We urge the EPA to recommend to the Environment Minister and the Minister for Mines and Petroleum, and the Department of Mines and Petroleum to include a public review period for Mine Closure Plans submitted to the DMP. We also seek resolution on the legal gap that the DMP who will assess the mine closure plan has no heads of power to enforce environmental conditions.

Flora and Fauna:
There should be complete, comprehensive studies and data on flora and fauna before a mine closure plan is developed – we don't believe the information presented in the ERMP equates to a comprehensive baseline study on flora and fauna. With the information provided in this report there is no clear vision of what the environment or biodiversity post closure should look like (see section on biodiversity for more specific detail).

Radiological monitoring:
Much like our comments above on flora and fauna, the information provided on the radiological environment, in water, dust and outside the project site are not sufficient to map the radiological environment. One particular area where there is an identified gap is a gamma survey on surface water. Radiological monitoring is particularly important within the National Park and the surrounding communities at Punmu, Parnngurr, Jigalong and Nullagine. Mine closure planning cannot occur without this level of detail. This information should also be made publicly available as there is a significant public interest and risk to public health from this proposal. The public should have access to clear background studies on radiation with which to measure any change.

Seepage – tailings and mineralised waste rock
The risk assessment in the Conceptual Mine Closure Plan stated there is a *"very high risk and severe consequence"* from seepage from the tailings management facility. The tailings management facility has not yet been completely designed and there is no management plan for the tailings at all. Cameco has suggested that "*with 'controls' in place*" the risk will be reduced to *"moderate, unlikely and with no major consequences".*

The Potential impacts include *"extensive and prolonged surface water and groundwater contamination. Requirement to pump (and possibly treat)* ***for extended period*** *of time post closure."* They have proposed to *"limit migration of wastes."* The risk of tailings seeping into the environment and groundwater makes this kind of proposal unacceptable. WA's biggest National Park, the Rudall River water catchment and community drinking water is at risk from radioactive material seeping from the mine site. There are two areas where Cameco has conceded that there will be seepage - tailings and mineralised waste rock - both with radioactive material. Tailings and waste rock will be permanent structures in the environment post mine closure. The radiation signature of these structure will take up to, and likely much longer than, 10,000 years.

There absolutely has to be a full 100% mine closure bond requirement placed on Cameco, to be annually reviewed and adjusted. There must be conditions placed on the project to effectively isolate tailings from the environment for no less than 10,000 years. The company

must retain liability over the site for this period, with conditions on monitoring and remediation.

Anything less will condemn the Western Australian tax payers to an uncapped liability, will put the National Park and the catchment area under threat of contamination.

Acid Metalliferous Drainage:

There is no assessment of the risk of Acid and Metalliferous Drainage (AMD) from the tailings. As we mentioned earlier, Cameco propose to use a large volume of sulphuric acid in processing, but indicate they will not be using a large volume of lime - which would be used to neutralise the acids. We are concerned this could create the potential for AMD from the tailings. We are concerned that this has not been considered or addressed and yet it one of the most serious long term environmental risks from this project.

AMD is a very real issue with mine closure, a problem that is very hard to clean up once the AMD process has begun. AMD pollution exists at many mine sites in Australia and some in WA. It is very expensive to clean up AMD and often cleanup efforts are not successful. The best way to deal with AMD is prevention. The lack of discussion of the issues of AMD in relation to the high volume of acid used in processing is a worry. We have no confidence that the proponent has given AMD adequate thought and have put in place the mechanisms, structures and monitoring programs to mitigate the risks of AMD.

Mine Pit:

The proposal to back fill part of the pit and turn it into a Lake has many issues that need to be addressed. There is a significant uranium deposit at Kintyre, and a substantial amount of uranium that will not be mined. How this remaining uranium ore will interact with the lake and how the lake will be designed are very significant engineering issues. There are a number of questions we have;

1. How will the radiation from the remaining uranium deposit interact with the lake?
2. How deep will the lake be?
3. How will the water in the lake interact with groundwater?
4. How would non mineralised ore act as a barrier for radiation or seepage?
5. How will the water in the lake be contained, will there be pathways into Yantakuji creek - during dry period and during flooding?
6. What is the risk of contamination of the lake and the creek?
7. What monitoring will be done at the lake?
8. Will the lake be used as a swimming hole by people travelling through the area?
9. If so - it is likely people and fauna will be attracted to the potential swimming hole, in an otherwise hot and dry area - what kind of warnings, signage and radiation education will be done for users, will there be regular monitoring? Or will the area be fenced off?
10. If the lake will be a permanent feature will Cameco be a permanent custodian of the lake, it's monitoring and decontamination when required?

There should be alternative plans developed for the rehabilitation of the pit considering

public interaction with the pit/ lake, its long term integrity, long term liability and whether that liability is on the state or the company, impacts on Yantakuji Creek and contamination risks.

10,000 years:

"The expected monitoring period post closure is expected to be around 10 years however this will vary depending on monitoring result demonstrating baseline or acceptable values at the time of closure" - ERMP Appendix D17 - Conceptual Mine Closure Plan.

We have already discussed the WA Government motion to isolate tailings from the environment for no less than 10,000 years. Suffice to say there has been no discussion from Cameco or ENVIRON in the conceptual mine closure about this time frame.

Even the fundamental principles for closure objectives are minimal. We would expect to see in the actual Mine Closure Plan, to have modelling on closure and rehabilitation over the 10,000 year period. Within this we would expect details, data and technical information on the tailings, waste rock land forms, and the pit. We would expect there would be some modelling of seepage from all three of these structures and discussion on how future weather patterns will impact on the integrity of the structures and how they may increase the rate of seepage or erosion.

Mine Closure Bond:

Please note that in this conceptual plan ENVIRON has indicated that in a worst case scenario a mine closure cost or liability would be $5 million. This figure is a gross under-estimation of the costs of mine closure and rehabilitation. For example the Federal Government recently spent $8 million dollars just to assess what will be needed to rehabilitate the Rum Jungle uranium mine in the Northern Territory. Rio Tinto/ ERA reported in 2012[59] that the closure cost of the Ranger uranium mine would be $640 million. That estimate came before one of the leach tanks at Ranger burst in December 2013, spilling 1000 cubic metres of ground up uranium ore and acids.[60]

Radiation and public access to the site:

Consultant Nick Tsurikov has raised concerns about regulations and standards of radiation in rehabilitation and public access to closed sites[61]:

> *"The grantee party undertakes to return any site of ground disturbance to a condition prescribed by relevant regulatory guidelines for environmental rehabilitation to its original state or so that it poses no radiation threat to the public.*
>
> *a) Unfortunately, the earlier DoCEP guideline contained the suggestion that "drill sites must be cleaned to 1 microSievert per hour at a height of 1 meter (excluding any natural mineralized outcrops in the area)" that was in direct contradiction with the requirement of the return of the site to its original state.*

[59] http://www.energyres.com.au/documents/2012_ERA_Annual_Report_FINAL.pdf
[60] http://www.abc.net.au/news/2013-12-07/spill-at-nt-uranium-mine-near-kakadu/5142148
[61] Section 8.2.5 in Tsurikov, Nick, 2009, 'Uranium Exploration: Safety, Environmental, Social and Regulatory Considerations', http://calytrix.biz/papers/index.htm or direct download http://calytrix.biz/papers/09.U_exploration_09.pdf

b) The use of the clean up criterion of "less than 1 microSievert per hour" would result in an unacceptable radiation exposure to members of the general public. Even when only the exposure to external gamma radiation is considered in a dose assessment (not taking into account any other exposure, such as inhalation of dust and ingestion of soil and flora/fauna), the dose constraint of 0.3 mSv/year that is used for classification of contaminated sites (part 6) will be reached in less than two weeks (300 hours or twelve and a half days) of the permanent occupation of the site.

The possibility of Aboriginal people camping on the particular former drilling site for about two weeks or more cannot be ruled out. Therefore, the criterion mentioned above is unacceptable and emphasises the requirement for all radiation management plans approved prior to 2008 to be re-assessed and amended where necessary, as soon as possible."

In the unfortunate situation that Cameco ignores the unsustainable economic situation facing the industry, the public opposition, the environmental and public health risks, the massive cost and liability of closure and decides to pursue the Kintyre uranium mine, we insist on the opportunity to look at the Mine Closure Plan and make comment.

13. RADIATION RISKS

With regard to radiation risks, we again make the observation that the ERMP is incomplete with missing baseline studies and management plans. The Radiation Management plan falls firmly in this category, and again is one of the most critical environmental aspects of the proposed uranium mine.

*"A detailed **radiation management plan** and a radioactive waste management plan will be required to be approved prior to commencement. These plans will have details of radiation protection and radioactive waste management specific to the plant and equipment to be installed, and the way in which is to be operated. **These detailed designs are not available at the time of writing this plan."***

The Radiation Management Plan submitted - Appendix D to the ERMP is not a plan but rather a set of guiding principles, that a future plan may (or may not) be based on. There are no commitments from Cameco to upholding these principles. If approved this will give Cameco a *cart blanche* to manage radiation with minimal rigour.

"*A detailed **environmental monitoring plan** will be prepared for approval prior to construction commencing."*

Cameco has not included any details on baseline studies (except for the occasional mention that there are some existing studies) of radiation in the environment. There is no methodology provided on the baseline studies or a future program of monitoring. There is no detail on any monitoring program for environmental radiation. In various other sections on flora, fauna, water, and dust there is no data on radiation levels.

The process is back to front. Baseline studies and monitoring should have begun and data should be presented here as the basis to form the management plan. The whole process is out of order and the public is left without access to the relevant data, studies and management plans and with no future opportunity to engage.

Radiation Management Plan:

The section on occupational monitoring of radiation lacks detail and is based on expected levels of exposure. There is no indication as to how these expected levels were determined.

Table 1 - *"Outline of the proposed occupational radiation exposure monitoring program"* - names the various forms of radiation that could lead to exposure but does not identify all the activities that have a risk of exposure, and the mitigating plans for exposure.

For example Cameco describes protocols for leaving dirty clothes at the end of the shift ("all work clothes will be laundered on site") but there is no mention of radiation protection for cleaners, or how contaminated water from the laundry will be managed. There is an overall lack of any comprehensive management plan for radiation.

Advice from the International Commission on Radiological Protection indicates that radon progeny is twice as carcinogenic as previously thought.[62] Cameco has mentioned the potential for inversions to occur and that they pose a risk to radon build up. Studies have shown that with inversions, radon progeny can accumulate anywhere between 100 and 1000 times higher than natural levels.[63] We would expect a much more detailed management plan to avoid worker exposure to radon.

We ask the EPA to determine whether the following concerns raised by Nick Tsurikov have been satisfactorily addressed[64]:

a) The fact that ARPANSA has issued a Code of Practice for a particular activity does not mean that this Code is immediately applicable to this activity in Western Australia. As described above in part 3.4, the ARPANSA Code for mining and mineral processing, whilst used by both government and industry in the development of guidelines and radiation management plans, is legally not in force in the State of Western Australia until such time as the relevant regulations have been officially amended to include the Code.

It could be argued that there is no necessity for the Code to be incorporated into regulations, as appropriate provisions can be made under existing WA laws, such as the Mining Act, Mines and Safety Inspection Act and Environmental Protection Act; through the approvals of Programs of Work, Mining Proposals, Radiation Management Plans and the imposition of tenement/license conditions. These measures, however, would address only specific parts of mining and minerals processing industry in Western Australia (or specific companies) and, therefore, any legal references to the Code should be treated with caution.

[62] ICRP www.icrp.org/docs/ICRP_Statement_on_Radon(November_2009).pdf
[63] Appendix 4 - Comments on Toro Energy Ltd's Wiluna Uranium Project ERMP, Dr Gavin M. Mudd, Senior Lecturer / Course Director, Environmental Engineering, Monash University, Clayton, VIC
[64] Tsurikov, Nick, 2009, 'Uranium Exploration: Safety, Environmental, Social and Regulatory Considerations', http://calytrix.biz/papers/index.htm or direct download http://calytrix.biz/papers/09.U_exploration_09.pdf

It would be more appropriate for the company to be bound by the WA Mining Act, WA Mines Safety and Inspection Regulations (Part 16 - Radiation Safety), and associated guidelines (2008), administered by the WA Department of Mines and Petroleum; and by the WA Radiation Safety and Radiation Safety (Transport of Radioactive Substances) Regulations, administered by the WA Radiological Council.

b) It appears that the statement by the company that it is "complying with the Radiation Safety Manual and Uranium Guidelines" may not be sufficient in all cases. It is further explained in paragraphs 24 - 26 (of Wilma Freddie and Others), that the actual reference is to the Radiation Management Plan as defined in WA Mines Safety and Inspection Regulations. As described in part 3.4 above, it is strongly advised that radiation management plans of uranium exploration companies that were approved prior to 2008 are reviewed and amended to reflect the current requirements - particularly in regards to the radiation levels acceptable for the cleanup of exploration sites and their final rehabilitation.

On radiation management plans approved prior to 2008, Mr Tsurikov states:

"Additionally, radiation management plans approved prior to 2008 may need to be amended to include the requirements arising from new WA guidelines for radiation protection in mining and mineral processing (2008). ...

"Prior to the publication of the new WA guidelines the primary source of information for mineral exploration companies in Western Australia was a Draft Guide on Radiation Safety in Uranium Exploration from the Resources Safety Division of the Department of Consumer and Employment Protection of WA.

"The document contained a number of the assumptions and values that were not entirely correct and it is strongly advised that radiation management plans of uranium exploration companies that were approved prior to 2008 are reviewed and amended to reflect the current requirements – particularly in regards to the radiation levels acceptable for the cleanup of exploration sites and their final rehabilitation. ...

Mr Tsurikov details numerous problems regarding radiation safety training and officers, including inadequate training, the shortage of adequately trained personnel, etc.[65] He warns that: *"There have been cases of people not previously involved in any way with mining and mineral processing industry and/or particular chemical and thermal mineral processing techniques undertaking measurements, carrying out training and providing advice to companies on the management of radiation; both overseas and in Australia - with abysmal results."*

Cameco's Dangerous Radiation Propaganda

Cameco has consistently promoted the fringe view that exposure to low-level radiation is harmless. Cameco has sponsored[66] speaking events by Canadian junk-scientist Dr Doug

[65] Section 8.2.2 in Tsurikov, Nick, 2009, 'Uranium Exploration: Safety, Environmental, Social and Regulatory Considerations', http://calytrix.biz/papers/index.htm or direct download http://calytrix.biz/papers/09.U_exploration_09.pdf
[66] http://www.northumberlandtoday.com/2010/09/21/radiation-good-for-you-dr-boreham

Boreham, who argues that low-level radiation is actually beneficial to human health. Dr Boreham has also travelled to Australia to promote these views in 2007[67] and 2010[68].

Those views are at odds with mainstream scientific evidence and expert assessment. For example:

- A 2010 report by the United Nations Scientific Committee on the Effects of Atomic Radiation states that *"the current balance of available evidence tends to favour a non-threshold response for the mutational component of radiation-associated cancer induction at low doses and low dose rates."*[69]
- The 2006 report of the Committee on the Biological Effects of Ionising Radiation (BEIR) of the US National Academy of Sciences states that *"the risk of cancer proceeds in a linear fashion at lower doses without a threshold and ... the smallest dose has the potential to cause a small increase in risk to humans."* The report also concludes that claims that low-level radiation exposure may be beneficial to human health are "unwarranted".[70]
- An expert review published in the Proceedings of the National Academy of Sciences (US) in 2003 concluded that: "Given that it is supported by experimentally grounded, quantifiable, biophysical arguments, a linear extrapolation of cancer risks from intermediate to very low doses currently appears to be the most appropriate methodology. This linearity assumption is not necessarily the most conservative approach, and it is likely that it will result in an underestimate of some radiation-induced cancer risks and an overestimate of others."[71]

It is irresponsible for Cameco to consistently promote fringe scientific views regarding the health effects of ionising radiation.

Even more alarming is that Cameco has actively promoted this view through its newsletters to Aboriginal communities about the Kintyre project.[72]

Cameco talks glowingly about Boreham's 2010 visit to Australia.[73] Cameco ought instead to have noted that Boreham's dangerous junk science is directly at odds with the sort of information Cameco provides to regulators when seeking licences to mine uranium.

Recent scientific research has heightened concern about exposure to radon, the main source of radiation doses to uranium industry workers. In 2009, the International Commission on Radiological Protection concluded that radon gas delivers almost twice the radiation dose to humans as originally thought and the Commission is in the process of reassessing permissible levels. Previous dose estimates to miners need to be approximately doubled to accurately reflect the lung cancer hazard.

[67] http://ntne.ws/#/article/500f70ebc5b261906c000351
[68] http://www.cmewa.com/UserDir/CMEPublications/101015-MEM-Discovery%2021-v1206.pdf and www.cameco.com/common/pdf/australia/kintyre/Cameco_4_Newsletter.pdf
[69] http://www.unscear.org/docs/reports/2010/UNSCEAR_2010_Report_M.pdf
[70] http://www.nap.edu/books/030909156X/html
[71] http://www.ncbi.nlm.nih.gov/pubmed/14610281
[72] http://www.cameco.com/fuel_services/common/pdfs/newsletters/Cameco_-_Community_Forum_newsletter_November_2010.pdf
[73] www.cameco.com/common/pdf/australia/kintyre/Cameco_4_Newsletter.pdf

Cameco's ERMP notes heightened concern about radon. Yet in its public activities it promotes junk science directly at odds with admissions made in the ERMP. The company's behaviour is both dangerous and duplicitous.

A Cameco newsletter states: *"The health of uranium workers has been extensively studied and the conclusion is that the risk from radiation exposure for people working at modern uranium mining facilities is comparable to that for the general public."*[74] That statement is false - annual doses for workers are typically *several times greater* than for members of the public - and provides further evidence of Cameco's dangerous and duplicitous attitude.

Appendix D of the ERMP states: *"It is well known that high doses of ionising radiation can cause harm, but there is continuing scientific uncertainty of the effects of at low doses. At levels of dose routinely encountered by members of the public and occupational exposed persons in Australia, there is little or no epidemiological evidence of health effects."* That statement is inconsistent with the IARC 15-country study and other studies discussed and referenced in a paper by Nuclear Radiologist Dr Peter Karamoskos.[75]

Likewise, the study published in the Proceedings of the National Academy of Sciences states: *"First, what is the lowest dose of x- or gamma-radiation for which good evidence exists of increased cancer risks in humans? The epidemiological data suggest that it is approximately 10-50 mSv for an acute exposure and approximately 50-100 mSv for a protracted exposure."*[76]

Doses as low as 10 mSv are well within the range of occupational exposures (limited to 50 mSv in any one year, averaging no more than 20 mSv over five years).

Cameco ought to be - but evidently isn't - aware of studies such as these:[77]

Study	**Effect**	**Average dose or dose range**	**Lowest estimated dose**
Ukraine contaminated areas (Noschenko et al, 2001)	leukemia	10 mSv	4.5 mGy
Chernobyl cleanup workers (Zablotska et al, 2012)	leukemia	132 mGy bone marrow dose	~5 mGy bone marrow dose
Nevada test site (Steven et al, 1990)	leukemia	6 to 30 mGy	6 mGy
Canadian radiation workers (Sont et al, 2001)	solid cancers	-	6.5 mSv
Nuclear industry workers (Cardis et al, 2005)	leukemia	19 mSv	“low”
In utero X-rays (Stewart et al,1956)	leukemia	10 – 50 mSv	~10 mSv
Childhood thyroid exposures (Ron et al, 1996)	thyroid cancer	50 mSv	10 mSv
US scoliosis from X-rays (Doody	breast cancer	100 mSv per 25	10 mSv

[74] www.cameco.com/common/pdf/australia/kintyre/Cameco_4_Newsletter.pdf
[75] http://www.mapw.org.au/files/downloads/Nuclear_power_and_public-health_MAPW.pdf
[76] http://www.ncbi.nlm.nih.gov/pubmed/14610281
[77] http://www.ianfairlie.org/news/a-100-msv-threshold-for-radiation-effects/

et al, 2000)		exposures	
Childhood thyroid cancer (Jacob et al, 1999)	thyroid cancer in Belarus + Russia	50 mGy thyroid dose	25 mGy thyroid dose
Japanese bomb survivors (Preston and Pierce, 2003)	Solid cancers	200 mSv	34 mSv

Uranium Mining and Ionising Radiation

Below is an excerpt from the detailed, referenced paper by Nuclear Radiologist Dr Peter Karamoskos posted at:
http://www.mapw.org.au/files/downloads/Nuclear_power_and_public-health_MAPW.pdf

The link between uranium mining and lung cancer has long been established. Certain groups of underground miners in Europe were identified as having increased mortality from respiratory disease as early as the 16th century. Lung cancer as the cause was not recognised until the 19th century. The radioactive gas, radon, was identified as the cause in the 1950's. Studies of underground miners, especially those exposed to high concentrations of radon, have consistently demonstrated the development of lung cancer, in both smokers and non-smokers. On this basis, the International Agency for Research on Cancer (IARC) classified radon as a carcinogen in 1988. In 2009, the ICRP stated that radon gas delivers twice the absorbed dose to humans as originally thought and hence is in the process of reassessing the permissible levels. At this stage, however, previous dose estimates to miners need to be approximately doubled to accurately reflect the lung cancer hazard.

The Biological Effects of Ionising Radiation VI report (1999) reviewed eleven cohort studies of 60,000 underground miners with 2,600 deaths from lung cancer, eight of which were uranium mines in Europe, North America, Asia and Australia. These found a progressively increasing frequency of lung cancer in miners directly proportional to the cumulative amount of radon exposure in a linear fashion. Smokers had the highest incidence of lung cancer, as would be expected, however, the greatest increase in lung cancer was noted in non-smokers. The highest percentage increase in lung cancer was noted 5-14 years after exposure and in the youngest miners.

Uranium miners are also exposed to IR [ionising radiation] directly from gamma radiation and the dose from this is cumulative to that from radon. At the Olympic Dam underground uranium mine, the total dose per miner is approximately 6mSv, of which 2-4 mSv (allowing for the new ICRP dose coefficients) are due to radon and the balance due to gamma radiation.

Most modern uranium mines have air extraction systems and monitored ambient measures of radon concentrations to ensure levels remain low. Current levels of radon in underground uranium mines are only a fraction of mines over one hundred years ago. Furthermore, miners are given personal protective equipment (PPE) including masks to filter out the radioactive particulate matter. However, many underground miners find the masks extremely uncomfortable, especially in the hot underground environment they must contend with. It is estimated that up to 50% of underground uranium miners in Australia do not use their masks, and thus drastically increase their risk of lung cancer, whilst underestimating their actual radiation dose (since this is calculated assuming PPE's are used).

The Olympic Dam doses mentioned above are typical of modern mine practices. The average miner at Olympic Dam is in his twenties and stays on average five years at the site. A typical calculation using the linear no threshold model and the latest BEIR-VII figures of radiation carcinogenesis risks indicates miners at Olympic Dam therefore have a 1:420 chance of contracting cancer, most likely lung cancer. Note that as the research demonstrates risk of developing lung cancer is greater for younger workers. These risks are not insubstantial. Radiation safety and risk principles can be quite complex and it is debatable whether miners have the training to understand the basis of such risks, or are even informed of these risks in a comprehensive and accurate manner that they can comprehend and make an informed work decision.

14. URANIUM TRANSPORT

Cameco do not have a complete transport management plan, they have done no risk assessment on non-radiological risks and have not yet devised a security plan for transport. All these issues are of significant public interest yet Cameco has evaded any level of public scrutiny.

The transport management plan that Cameco include in the ERMP is redundant, considering that they intend to contract a transport carrier who will then submit their own Transport Management Plan.

Cameco's Transport Management Plan is presented as *"preliminary draft that will be progressively developed and finalised for assessment by relevant government regulators for the transport of uranium Oxide".*

There are many significant aspects of transport that have a high level of public interest and should be presented for public review that have not been included in this draft transport plan – like a security plan which is *“to be developed after approval and prior to commencement of transport operations.”*

Cameco commissioned ANSTO to complete a Transport Risk Assessment. This risk assessment only looks at radiological risks. The ANSTO report states Pg 35. *“A separate risk assessment of non-radiological risks should be undertaken prior to commencement of operations.”*

There are also inconsistencies with the figures on the proposed distance uranium will be transported. Here are two examples found within the report:

- ERMP Appendix Q Greenhouse Gas Report - pg. 16 Tetra tech account for the transport of product to port at a distance of 3,900km. Other sections of the ERMP refer to the distance as 4,600km.
- ERMP Appendix D3 9.4.5 Transport Management Plan Cameco state that *“Up to five road trains may travel the route during a single week but on average about 100 shipments will occur in a single year.”* This statement is repeated throughout the

ERMP. However the ANSTO "Transport Risk Assessment" has based their risk analysis on just 70 transport movements per year – not the 100 that Cameco has suggested.

These mistakes inspire little confidence in the analysis and the assessment of risk of radiological or non-radiological risks.

Given the high level of public interest in the transportation of radioactive materials any future transport management plans, assessments of both radiological and non-radiological accidents should be released for public review and comment with special efforts to engage and inform the communities that will have uranium transported along their roads.

ACCIDENTS

Cameco has a recent history of uranium transport accidents; it has avoided disclosing this in the ERMP.

ERMP Appendix - D2 - 5.1 Corporate Responsibility "*Historically, there have been **no reported** transport accidents involving radioactive material from Cameco's operations worldwide that have resulted in **serious radiological consequences** to the environment or communities along transport routes."*

Cameco has made a point of stating there was *"no reported"* accidents with "serious radiological consequences" but have failed to acknowledge that Cameco has had two 'reported' uranium transport accidents in recent years:

1. A shipment of uranium from Saskatchewan Canada to China ran into some bad weather. During the incident *"Three drums popped open in the hold and uranium ore concentrate - known as yellowcake - spilled out. The uranium stayed in the hold and nothing spilled into the sea, but the ship turned around and went home. It took $8 million to take the cargo out and clean up the spill."*[78]

2. A truck of uranium hexafluoride travelling from Port Hope in Canada to Kentucky USA caught fire just outside Troy Ohio. The truck driver removed the truck which was in flames from the cargo of uranium hexafluoride which averted any serious disaster. The aversion of a major incident all came down to the quick thinking and bravery of the truck driver.[79]

The discussion around Cameco and its recorded accidents should not be confined to transport especially considering that Cameco is no stranger to disaster. Detailed lists of the proponents' blunders have been included in Appendix 7 of this submission titled **'Cameco Corporate Profile'** and Appendix 8 titled **'Mitsubishi Corporate Profile'.**

Cameco, using a very basic risk assessment matrix, claim the risk of an accident would be low -ERMP Appendix D3- 9.5.4. This is based on the study by ANSTO which only identifies radiological risks. Cameco and ANSTO have not provided any data, analysis or risk analysis on the frequency of transport accidents. There is no study on the volume of traffic along the

[78] http://www.cbc.ca/news/canada/saskatchewan/no-money-for-cameco-after-sale-of-ship-that-had-uranium-spill-1.1360155
[79] http://www.thestar.com/business/2013/10/31/burning_truck_hauling_nuclear_load_flies_under_radar.html

transport route, no assessment of the likelihood of an accident based on the volume of trucks over the kilometre distance travelled and many other factors that contribute to calculating risk.

Accidents and 'incidents' involving radioactive materials are certainly common enough - industry propaganda notwithstanding. The Australian Nuclear Science and Technology Organisation has acknowledged that there are 1-2 accidents or 'incidents' every year involving the transportation of radioactive materials to and from the Lucas Heights reactor site. One recent accident involving radioactive material in WA took place at the intersection of the Brand and Great Northern highways.[80] One truck was carrying a radioactive isotope used in industrial operations.

There are numerous concerns regarding truck accidents, an essential factor in the assessment and or development of a Transport Management Plan:

- During the 12 months to the end of December 2010, 244 people died from 210 crashes involving heavy trucks or buses across Australia. These included 147 deaths from 127 crashes involving articulated trucks, and 85 deaths from 70 crashes involving heavy rigid trucks.[81]
- Per distance travelled, articulated trucks are involved in significantly more fatal accidents than cars.[82]
- A 2011 report finds that the number of registered heavy vehicles in Australia has risen 22% (to 536,247) since 2005 and is projected to double by 2030.[83]
- Truck accidents killed 50% more people on Victorian roads in 2010 compared to 2009 (60 deaths compared to 40).[84] Professor Bill Russell, deputy director of Melbourne University's Australasian Centre for the Governance and Management of Urban Transport, said Australians would be safer if more freight was moved by rail - yet the number of trucks on the roads was increasing rapidly.
- The WA Auditor General noted that WA Main Roads' compliance officers stopped over 5300 heavy vehicles between July 2004 and February 2005 with approximately 15% of operators received financial penalties or work orders. The Auditor General also noted that heavy vehicle crash data in WA is inaccurate and incomplete and that poor data makes planning and assessment of policy and practice difficult.[85]

Cameco has not discussed public opposition to uranium transport through regional communities or how to engage with those communities and there are no commitments to consult with the public generally or specifically in the communities where it is proposed uranium will be transported through. There is evidence that the issue of uranium transport through communities is of significant public interest.

For example: In 2011 the City of Kalgoorlie-Boulder voted to impose a set of strict conditions on uranium transport through the city because of concern for public safety. Motions were

[80] Police investigate radioactive threat from crash, 6 September 2011, www.abc.net.au/news/2011-09-06/radioactive-truck/287329
[81] Fatal heavy vehicle crashes quarterly bulletin, October - December 2010 http://www.bitre.gov.au/publications/07/Files/FHVCA_Dec2010.pdf
[82] Cost of road crashes in Australia 2006, www.bitre.gov.au/publications/48/Files/Cost_of_road_crashes_in_Australia.pdf
[83] Raftery SJ, Grigo JAL, Woolley JE, 2011, Heavy vehicle road safety: Research scan, Centre for Automotive Safety Research, http://casr.adelaide.edu.au/casrpubfile/1099/CASR100.pdf
[84] Truck accident deaths soar in Vic, 15 February, 2011, www.industryupdate.com.au/focus-corner/article/560
[85] WA Auditor General's Report, Report 4 – June 2005, Regulation of Heavy Vehicles.

put forward at a council meeting to reject any transport of uranium through the city. Cr Botica said *"The risk posed to the general public by the transportation of uranium is too high"*. She said the issue should be put to a referendum.[86]

Compliance and Safety in WA:
There have been well-documented and ongoing compliance and safety problems with transport and handling of toxic chemicals and other substances in the mines and petroleum sector in WA. Community confidence in the regulation of these activities is very low in Western Australia following serious lead-dust contamination in the town of Esperance. There were 28 serious transport and handling accidents reported in WA during 2009/10 including an LNG tanker roll over, a spill of 35,000 litres of cyanide, a number of acid and acid-waste spills and other serious accidents involving ammonium nitrate, flammable gas and other toxic and hazardous materials.[87]

A short list of truck accidents in WA over the last three months:

- 9th December 2013 - road train tips over east of Warmun and spills ammonium nitrate[88]
- 19th November 2013 - car and truck collide[89]
- 12th November 2013 - truck driver dies in two truck crash - chemicals on board[90]
- 24th October 2013 - road train collides with power pole[91]

The frequency or truck accidents are significant and are a further reason for the highest level of rigor and transparency to be applied to the ERMP and future transport management plans.

15. SOCIAL IMPACTS – JOBS & PUBLIC OPINION

Jobs and economic development:
Cameco's description on the number of employees for the project is yet another example of inconsistency within the report.

In the project description Section 6 Cameco state: *"It is anticipated that the Project would require a construction workforce of up to 400 employees and an operational workforce of up to 450 employees, around 200 of whom would be on site at any one time. Around 30 employees would be based in Perth. Employees and contractors would be sourced from regional centres and Perth."*

This statement isn't very clear about the ongoing number of workers for the life of the mine. Perhaps this is deliberate. On searching for a more accurate or clear description we found in the Conceptual Mine Closure Plan, Table 21- Indicative Project Characteristics, a different

[86] Tomlin, S., Tough Uranium Stance, Kalgoorlie Miner, Wednesday October 26 2011, pp.1, 3
[87] Legislative Council, Question on notice, Tuesday, 9 November 2010, 3012- Hon Robin Chapple. Answers from the Minister for Mines and Petroleum the Hon. Norman Moore- received Thursday 2 December 2010.
[88] http://www.abc.net.au/news/2013-12-09/police-probe-great-northern-highway-chemical-spill/5144608/?site=kimberley
[89] http://www.abc.net.au/news/2013-11-19/truck-and-car-collide-on-tonkin-highway-intersection/5102410
[90] http://www.abc.net.au/news/2013-11-12/highway-could-remain-closed-for-up-to-three-days-following-crash/5085154
[91] http://www.abc.net.au/news/2013-10-24/road-train-driver-survives-muchea-crash/5043630

number of workers for the operation of the mine:

Construction workforce	Up to 400 employees on FIFO roster housed at an on-site accommodation village.
Operational workforce	Up to 250 employees on FIFO roster housed at an on-site accommodation village.

The difference in predicted number of operational workforce here compared to the description in section six is almost half.

In another description about the workforce the numbers are different again *"It is anticipated the Project would require a construction workforce of up to 500 employees and an operational workforce of up to 450 employees, around 200 of which would be on-site at any one time"* ERMP Appendix D6 - Waste Management Plan.

As of December 2012 the uranium industry accounted for 0.015% of all jobs in Australia (see Appendix 9). The World Nuclear Association put the figure at 1,760.[92]

In the year 2011/ 2012 uranium accounted for 0.19% of national export revenue. Mining is capital intensive and comes in at number 19 in the Australian Bureau of Statistics' top 20 industries in order of employment.[93]

The small amount of jobs for a mine with a short life and raising little export revenue for Australia does not warrant the long term impacts on the local environment and the threat to the National Park, the water catchment and communities.

Public Opinion:
A poll of 400 voters in the marginal Liberal-held seats of Riverton, Jandakot, Swan Hills and Mount Lawley in April 2011 found that 46% of voters opposed uranium mining in WA, with only 34% in favour and 20% undecided. A similar poll in October 2010 recorded opposition to uranium mining at 40%, with 42% in favour[94] this highlights a recent shift in attitudes away from the nuclear industry and uranium mining since the decision to mine uranium in WA and as uranium proposals reach the assessment phase.

Other findings of the April 2011 poll included:

- among swinging voters, support for uranium mining was only 28%
- those strongly opposed to uranium mining (32%) exceeded those strongly in support (8%) by a factor of four
- opposition is highest among women (55%) and people with dependent children at home (48%)

West Australian's peak environment group and peak union body along with the WA Labor Party and WA Greens and other civil society groups have called on the minority WA

[92] www.world-nuclear.org/info/inf48.html
[93] http://tiny.cc/0fxgu
[94] Campaign Capital, Capital Report, July 2011, 'Opposition to uranium mining increases post-Fukushima', www.campaigncapital.com.au

Government to initiate a full and open public inquiry into uranium mining. To date the Government has evaded these calls. There is significant and ongoing opposition to uranium mining in WA from a diverse range of civil society, environment, and public health, political and union's bodies reflecting a significant opposition. Considering the wide opposition to uranium mining and the unique public interest aspects of uranium mining, as well as the environmentally significant area at Kintyre and the Karlamilyi National Park, we call on the EPA to reject this proposal and recommend a public inquiry into uranium mining.

This level of assessment is required to demonstrate a level of regulatory response that is commensurate with the level of public interest and concern.

Public Consultation:

The call for a public inquiry is even more valid given the inadequacy of the consultation of this ERMP. As mentioned time and time again in this submission and many other submissions, the presentation of an ERMP with missing data, technical studies, incomplete management plans and the omission of other management plans is not an adequate consultation process nor is it a transparent process. What's more is that this process of deferring management plans to other agencies creates a situation where environmental conditions or approvals are granted by agencies with no powers to enforce environmental standards.

In addition to the broad and ongoing issues with the ERMP process and its integrity there are some other concerns we have about the timing of the ERMP release and activity of Cameco during the public consultation period.

The ERMP was released in November 2013, which is the beginning of 'hot time' when many people, particularly Martu, travel and are not in a position to review documents like the ERMP. This is also law time when many Martu are busy with cultural business.

The ERMP was made available in hard copy at the following locations:

- Department of Environment and Regulation Library - Reading Room 4th Floor, The Atrium, 168 St Georges Terrace, Perth
- J S Battye Library - State Library, 25 Francis St, Perth
- Shire of East Pilbara - Newman Community Library, Kalgan Drive, Newman
- Town of Port Hedland - South Hedland Library, Leake Street, South Hedland
- City of Kalgoorlie Boulder - William Grundt Memorial Library, Roberts St, Kalgoorlie
- Shire of Menzies - Menzies Public Library, Cnr Shenton & Brown Sts, Menzies
- Shire of Leonora - Leonora Library, Tower St, Leonora
- Shire of Sandstone - Sandstone Library, Hack St, Sandstone
- Shire of Mount Magnet - Mount Magnet Public Library, Hepburn St, Mount Magnet
- Shire of Cue - Cue Library, Lot 2 Austin St, Cue
- Shire of Meekatharra - Meekatharra Library, Shire Offices, Main Street, Meekatharra

There were no copies at the communities where the majority of Martu live and the communities most directly affected by the mine: Bawoorrga, Bayulu, Bidyadanga, Billuna, Fitzroy Crossing, Irrungadji, Goodabinya, Jigalong, Junjuwa, Kadjina, Kunawaritji, Kupartiya,

Largrange, Mindi Radi, Nullagine, Parnngurr, Parnpajinya, Punmu, Strelley, Wangkatjungka, Warralong, Yakanarra, Yandeyarra, Yungnora.

Cameco's lack of engagement and consultation with the people most directly impacted is not how a company with integrity or respect for the communities they intend to work with should behave.

Given that the uranium price is low and Cameco has indicated[95] that they will not actually develop the mine until it becomes commercially viable (a long way off) there was absolutely no time sensitivity around the release date of the ERMP.

The lack of a meaningful consultation process in Martu communities, the lack of information in the ERMP, complete management plans, data and the inconsistency provide the basis for an assessment process with a higher level of transparency and public engagement - by way of a Public Inquiry under section 42(c) of the EP Act under the power of a Royal Commission. We do not endorse or in any way support the ERMP process for the Kintyre uranium proposal.

We believe there should be a Royal Commission investigation into the agreement between Martu and Cameco and the role of the Western Desert Lands and Aboriginal Corporation in facilitating that process their interests and the financial rewards to individuals through that process.

16. GLOBAL WASTE AND SAFEGUARDS

Cameco's ERMP covers mining, processing and (domestic) transport of uranium but excludes other aspects of the nuclear fuel cycle. While this is common practice for uranium mining applications, it is unacceptable. The West Australian Government should require consideration of the global implications of Australian uranium mining as part of the approval process. The failure to address these issues is a major deficiency in the current planning and assessment regime and is further evidence of the need for a public inquiry under section 40 (2)(c) of the EP Act.

Uranium exported from Kintyre will at best end up as high-level nuclear waste. At worst it will end up as fissile (explosive) material in nuclear weapons. There is also the potential for Kintyre uranium to be implicated in a nuclear disaster such as that unfolding in Fukushima, Japan (uranium from Australia was used at the Fukushima plant).

Cameco proposes to export 2700 - 3600 tonnes of uranium oxide annually for 15 years (Kintyre Uranium Project, Environmental Scoping Document, Executive Summary), giving a total of 40,500 to 54,000 tonnes. The ERMP (Executive Summary) estimates production of up to 4,400 tonnes U_3O_8 for 12 years, giving a total of up to 52,800 tonnes, *"with the potential to increase this through continuing exploration"*.

[95] http://prosperitysaskatchewan.wordpress.com/2012/07/31/cameco-puts-kintyre-mine-project-on-ice/

Using those figures (40,500 to 54,000 tonnes U_3O_8), this would result in the production of:

- 6,075 to 8,100 tonnes of high-level nuclear waste (i.e. spent nuclear fuel) (200 tonnes uranium oxide per reactor-year; 202.5 - 270 reactor-years; 30 tonnes high-level waste per reactor-year)
- 61 - 81 tonnes of plutonium, sufficient for 6,100 to 8,100 plutonium bombs (202.5 - 270 reactor-years; 300 kg plutonium per reactor-year; 10 kg 'reactor grade' plutonium per weapon)

High-level nuclear waste

"The greatest minds in the nuclear establishment have been searching for an answer to the radioactive waste problem for fifty years, and they've finally got one: haul it down a dirt road and dump it on an Indian reservation".
— Winona LaDuke, Indigenous World Uranium Summit, 2006

The waste produced in nuclear reactors - called spent nuclear fuel - is orders of magnitude more radioactive than uranium fuel. This is because the irradiation of uranium results in fission yielding many types of radioactive particles. It takes about 200,000 years for the radioactivity of spent fuel to decline to that of the original uranium ore body because of the time required for decay of transuranics and long-lived fission products.

No country has a repository (dump) for high-level nuclear waste. So what does Cameco imagine will become of the high level waste that would inevitably arise from the mining and export of Kintyre uranium? Cameco should be required to provide concrete answers to that important question.

Sweden and Finland plan to have a repository operational within a decade or so. The planned repository in Finland will not even be able to accommodate all the high-level nuclear waste produced by six operational and planned reactors in that country alone. Explaining the consortium's refusal to accommodate waste from a planned sixth reactor, Posiva Oy President Reijo Sundell said in 2012: *"We're not trying to be nasty. But the simple fact is that there is not enough room. We can't expand the site under the sea. We can't create another deeper level because then it might not withstand the pressure of an ice age. And we can't build a shallower level because the underground water there is saltier and therefore more corrosive."*[96]

Apart from Sweden and Finland, few if any countries with high-level nuclear waste stockpiles have even identified a repository site let alone made any meaningful progress towards the establishment of a repository. Plans for a high level waste repository at Yucca Mountain in Nevada, USA, were abandoned in 2009. Over 20 years of work was put into the repository plan, and over A$10 billion spent. The repository plan was controversial and subject to occasional scandals including one involving the falsification of safety data in relation to groundwater modelling. Studies found that Yucca Mountain could not meet the existing radiation protection standards and subsequent moves by the US Environmental Protection Agency to weaken radiation protection standards also generated controversy.

[96] 24 Jan 2012, 'Posiva: No room for Fennovoima waste in nuclear cave', http://yle.fi/uutiset/posiva_no_room_for_fennovoima_waste_in_nuclear_cave/5295682

To reiterate, not one of the countries Cameco envisages exporting Kintyre uranium to has a repository for high-level nuclear waste. Not one.

Shallow repositories for low and short-lived intermediate level waste have been established in over 30 countries. A number have experienced problems. For example:

- Three repositories in the USA have been closed because of environmental problems.
- Farmers in the Champagne region of France have taken legal action in relation to a leaking radioactive waste dump.
- In Asse, Germany, all 126,000 barrels of waste already placed in a repository are being removed because of large-scale water infiltration over a period of two decades.

Plutonium and WMD proliferation

The discussion on safeguards in Cameco's ERMP (Section 8, Appendix F) could hardly be more superficial. That said Cameco does at least raise the issue so the WA Government is duty bound to consider it.

As discussed above, Cameco's proposed to export 40,500 to 54,000 tonnes U_3O_8 which would generate 61 - 81 tonnes of plutonium, sufficient for 6,100 to 8,100 plutonium weapons. There is no dispute among experts that the weapon-grade plutonium routinely produced in power reactors can be used in weapons; nor is there any dispute that reactors can be used to produce huge volumes of weapon-grade plutonium simply by shortening the irradiation cycle.[97]

The generation of so much weapons-useable plutonium would not be of such concern if a solid firewall separated the civil and military arms of the nuclear industry. However the nuclear 'safeguards' system is inadequate. During his time as Director General of the International Atomic Energy Agency, Dr. Mohamed El Baradei noted in various articles and speeches that the IAEA's basic inspection rights are "fairly limited", that the safeguards regime suffers from "vulnerabilities" and "clearly needs reinforcement", and that the safeguards system runs on a "shoestring budget ... comparable to a local police department".

To make matters worse Australia has uranium export agreements with:

- All of the 'declared' nuclear weapons states (USA, UK, China, France, Russia), none of which is currently complying with their disarmament obligations under the Nuclear Non-Proliferation Treaty (NPT).
- Countries with a history of weapons-related research based on their civil nuclear programs (such as South Korea and Taiwan[98]).
- Countries that have not ratified the Comprehensive Test Ban Treaty (China, USA)
- Countries blocking progress on the proposed Fissile Material Cut-Off Treaty (e.g. USA).
- Undemocratic, secretive, repressive states with appalling human rights records (e.g. China, Russia, and in the future the UAE).
- And there is now bipartisan support at the federal level to abandon the long-standing principle of refusing uranium exports to India on the grounds that it is a NPT non-

[97] http://foe.org.au/anti-nuclear/issues/nfc/power-weapons/rgpu
[98] Australia does not have a uranium export agreement with Taiwan but supplies uranium to Taiwan via the US.

signatory (and is expanding its nuclear weapons arsenal and missile capabilities, refuses to sign the Comprehensive Test Ban Treaty, developed its nuclear arsenal by breaching a 'peaceful use' agreement with Canada, etc).

Links to detailed information on the inadequate nuclear safeguards system are posted at:
www.foe.org.au/anti-nuclear/links#safeguards

Information on Australia's uranium customer countries is posted at:
www.foe.org.au/anti-nuclear/issues/oz/u/cc

17. CAMECO CORPORTATE PROFILE

Unlike other uranium proponents in WA, Cameco has a long history with which the public and the Government can draw on for evidence about how this company operates. Appendix 9 is a table of Cameco's incidents and accidents. The report is 17 pages long and with 32 entries with details on incidents, spills, military ties leaks and transport accidents involving Cameco operations. Appendix 10 is a smaller file on Mitsubishi's activities, incidents and accidents. Some entries in the table cover multiple issues. For example the first entry is as follows *"A total of 153 spills occurred at three uranium mines in Saskatchewan, Canada from 1981 to 1989. Amoc Mining reported 62 spills, Cameco 48 and Key Lake 43. The spill totals were requested after Cameco's Rabbit Lake mine reported a spill of two million litres of radium- and arsenic-contaminated water."*

Here's a snap shot of just a few examples of how Cameco operate;

- 1989 Cameco plead guilty to negligence and was fined $10,000 for leaking 2 million litres of radioactive liquid into a creek
- Inter-Church Uranium Committee (ICUC) from Saskatchewan, Canada, has revealed the export of at least 500 metric tons of depleted uranium to the US military by Cameco Corporation.
- Cameco is in the tax court over $800 million to $850 million in corporate taxes the Canada Revenue Agency says went unpaid between2008 and 2012.
- Sierra Club Canada reported that at Cameco's Northern Saskatchewan operations - *"As of 2010, water releases from Deilmann Tailings in cadmium exceed the Saskatchewan standard by an extraordinary 5,782 percent. Uranium concentrations were above the standard on average 1,323 percent and at the high level value by 10,153 percent! Radium 226 and lead 210 concentrations on average exceed the standard by 1,481 and 140 percent respectively. ...*
  "At the McArthur River site, concentrations of arsenic, selenium, and uranium in water effluent have exceeded the standards by 54 percent for arsenic, 700 percent for selenium and an astronomical 1,230 percent for uranium. There is no reporting done on mercury. Blueberries and fish are contaminated with uranium."

Allegations of tax fraud, flawed community consultation, radioactive leaks and spills and direct links to the production of nuclear weapons, Cameco embodies almost every aspect of why the public are opposed to the nuclear industry.

Through writing this submission there was a small team dedicated to research on Cameco's performance history. We have been horrified to learn more about this company and how it operates.

18. APPENDIX CONTENTS (attached PDF files)

Appendix 1: Mining Rehabilitation Fund and Uranium discussion paper CCWA
Appendix 2: Uranium Advisory Group - Uranium regulations WA
Appendix 3: CCWA appeal on Kintyre clearing permit 2011
Appendix 4: CCWA appeal on Kintyre clearing permit 2013
Appendix 5: Talking About Kintyre - Native Title Conference 2012 A.Turk, B.Hilliard
Appendix 6: EPA submission Kintyre 2014 - Dr Gavin Mudd
Appendix 7: Cameco Corporate Profile
Appendix 8: Mitsubishi Corporate Profile
Appendix 9: Yellowcake fever - exposing the uranium industry's economic myths - ACF

19. References

1. Environmental Protection Act 1986 http://www.austlii.edu.au/au/legis/wa/consol_act/epa1986295/
2. WA Mining Act 1978 http://www.austlii.edu.au/au/legis/wa/consol_act/ma197881/
3. Department of Mines and Petroleum – Report – Reforming Environmental Regulation www.dmp.wa.gov.au%2Fdocuments%2FReforming_Environmental_Regulation_in_the_WA_Resources_Industry_-_Final_Report_to_Minister(1).pdf&ei=CtjYUv6hNozckgWDv4HIAg&usg=AFQjCNF2CAxTOIMy7Aj0QdloZiRMMWFlTg&sig2=rZAgQrD68R9j0FIx1milIw&bvm=bv.59568121,d.dGI&cad=rja
4. Environmental Protection Act 1986 http://www.austlii.edu.au/au/legis/wa/consol_act/epa1986295/
5. For some examples of poorly rehabilitated exploration sites in Australia see http://australianmap.net/category/former-uranium-mine-or-plant/ and http://australianmap.net/overview
6. http://world-nuclear.org/info/Facts-and-Figures/World-Nuclear-Power-Reactors-and-Uranium-Requirements/
7. http://www.iaea.org/About/Policy/GC/GC57/GC57Documents/English/gc57-3_en.pdf
8. http://www.world-nuclear-news.org/NP-IAEA_foresees_continued_growth_in_nuclear_capacity-2509134.html
9. Calculated from tables 33 and 34, p.56, http://www-pub.iaea.org/mtcd/publications/pdf/pub1304_web.pdf
10. http://www.world-nuclear-news.org/ENF-Uranium_supply_and_demand_in_balance_for_now-1209137s.html
11. http://www.world-nuclear-news.org/NP-Steady-state-for-nuclear-in-2013-0701147.html
12. http://www.world-nuclear-news.org/NN_Nuclear_power_down_in_2012_2006131.html
13. http://www.worldnuclearreport.org/-2013-.html
14. http://www.worldnuclearreport.org/-2013-.html
15. http://www.worldnuclearreport.org/-2013-.html
16. http://www.guardian.co.uk/environment/2013/jul/11/nuclear-renaissance-power-myth-us
17. http://www.forbes.com/sites/jeffmcmahon/2013/11/07/6-nuclear-plants-that-may-be-next-to-shut-down/
18. http://will.illinois.edu/nfs/RenaissanceinReverse7.18.2013.pdf
19. www.wiseinternational.org/node/4032
20. http://www.liberumcapital.com/pdf/ULkWtp00.pdf
21. http://online.wsj.com/article/BT-CO-20121213-703038.html
22. http://uk.reuters.com/article/2012/12/04/enel-edf-idUKL5E8N4DIJ20121204
23. http://reneweconomy.com.au/2012/one-year-after-fukushima-counting-the-cost-of-nuclear-89801
24. http://www.businessinsider.com.au/5-charts-that-show-nuclear-is-declining-2013-10
25. http://www.world-nuclear-news.org/NP-Nuclear-to-remain-Korean-mainstay-1012137.html
26. http://atomicpowerreview.blogspot.com.au/2013/10/south-korea-cables-fail-tests.html
27. http://www.world-nuclear-news.org/RS-Indictments_for_South_Korea_forgery_scandal-1010137.html
28. http://www.worldnuclearreport.org/-2013-.html
29. http://www.world-nuclear-news.org/EE-Politics-hold-European-nuclear-steady-0901144.html
30. http://www.world-nuclear-news.org/ENF_Guangdong_nuclear_fuel_centre_cancelled_1807131.html
31. http://world-nuclear.org/info/Country-Profiles/Countries-O-S/Russia--Nuclear-Power/
32. http://www.world-nuclear.org/info/Country-Profiles/Countries-A-F/Canada--Nuclear-Power/
33. http://www.world-nuclear-news.org/NP-Nuclear_to_fund_French_energy_transition-2309137.html
34. http://www.reuters.com/article/2013/09/15/us-brazil-nuclear-idUSBRE98E06U20130915
35. http://analysis.nuclearenergyinsider.com/new-build/south-africa-puts-nuclear-hold
36. http://www.world-nuclear-news.org/RS_International_links_for_African_nuclear_1809131.html and http://www.worldnuclearreport.org/-2013-.html

37. http://warp.da.ndl.go.jp/info:ndljp/pid/3856371/naiic.go.jp/en/
38. http://www.chinapost.com.tw/taiwan/national/national-news/2013/03/10/372647/Up-to.htm
39. http://www.world-nuclear-news.org/NP-Taiwanese_nuclear_vote_turns_violent-0208135.html
40. http://www.world-nuclear-news.org/NP-New_nuclear_energy_policy_for_Taiwan-0311117.html
41. http://www.worldnuclearreport.org/-2013-.html
42. http://www.worldnuclearreport.org/World-Nuclear-Report-2013.html
43. www.world-nuclear.org/info/Nuclear-Fuel-Cycle/Mining-of-Uranium/World-Uranium-Mining-Production
44. www.mineweb.com/mineweb/content/en/mineweb-uranium?oid=175742&sn=Detail
45. www.uxc.com/products/rpt_usa.aspx
46. www.wna-symposium.org/pdf/2011_Fuel_Market_Report_Summary.pdf
47. http://www.theaustralian.com.au/business/mining-energy/uranium-industry-facing-volatility-paladin-md-john-borshoff/story-e6frg9df-1226680989121
48. http://au.news.yahoo.com/thewest/business/wa/a/20739113/paladin-in-no-rush-for-sale/
49. www.wise-uranium.org/umopasi.html#KZ and www.wise-uranium.org/upkz.html
50. http://money.msn.com/business-news/article.aspx?feed=OBR&date=20131113&id=17102011
51. http://www.thestarphoenix.com/business/Uranium+outlook+bleak/7270345/story.html
52. http://www.environment.gov.au/resource/investigation-tailings-water-leak-ranger-uranium-mine
53. http://www.theage.com.au/national/polluted-water-leaking-into-kakadu-from-uranium-mine-20090312-8whw.html
54. http://www.world-nuclear-news.org/ENF-Ranger_suspension_extended_as_rains_continue-1204117.html
55. http://www.minerals.dmitre.sa.gov.au/mines__and__developing_projects/approved_mines/olympic_dam/olympic_dam_incident_summary_2003_-_2012
56. "Dust over Eastern Australia". NASA - Earth Observatory. 25th September 2009. http://web.archive.org/web/20091030024037/http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=40302
57. The future of Yellowcake: A global assessment of uranium resources and mining *Science of The Total Environment*, *Volume 472*, *15 February 2014*, *Pages 590-607*
58. Dr Gavin Mudd "The Sustainability of Mining in Australia – Key production Trends and their Environmental Implications. http://civil.eng.monash.edu.au/about/staff/muddpersonal/rr5
59. http://www.energyres.com.au/documents/2012_ERA_Annual_Report_FINAL.pdf
60. http://www.abc.net.au/news/2013-12-07/spill-at-nt-uranium-mine-near-kakadu/5142148
61. Section 8.2.5 in Tsurikov, Nick, 2009, 'Uranium Exploration: Safety, Environmental, Social and Regulatory Considerations', http://calytrix.biz/papers/index.htm or direct download http://calytrix.biz/papers/09.U_exploration_09.pdf
62. ICRP www.icrp.org/docs/ICRP_Statement_on_Radon(November_2009).pdf
63. Appendix 4 - Comments on Toro Energy Ltd's Wiluna Uranium Project ERMP, Dr Gavin M. Mudd, Senior Lecturer / Course Director, Environmental Engineering, Monash University, Clayton, VIC
64. Tsurikov, Nick, 2009, 'Uranium Exploration: Safety, Environmental, Social and Regulatory Considerations', http://calytrix.biz/papers/index.htm or direct download http://calytrix.biz/papers/09.U_exploration_09.pdf
65. Section 8.2.2 in Tsurikov, Nick, 2009, 'Uranium Exploration: Safety, Environmental, Social and Regulatory Considerations', http://calytrix.biz/papers/index.htm or direct download http://calytrix.biz/papers/09.U_exploration_09.pdf
66. http://www.northumberlandtoday.com/2010/09/21/radiation-good-for-you-dr-boreham
67. http://ntne.ws/#/article/500f70ebc5b261906c000351
68. http://www.cmewa.com/UserDir/CMEPublications/101015-MEM-Discovery%2021-v1206.pdf and www.cameco.com/common/pdf/australia/kintyre/Cameco_4_Newsletter.pdf
69. http://www.unscear.org/docs/reports/2010/UNSCEAR_2010_Report_M.pdf
70. http://www.nap.edu/books/030909156X/html
71. http://www.ncbi.nlm.nih.gov/pubmed/14610281
72. http://www.cameco.com/fuel_services/common/pdfs/newsletters/Cameco_-_Community_Forum_newsletter_November_2010.pdf
73. www.cameco.com/common/pdf/australia/kintyre/Cameco_4_Newsletter.pdf
74. www.cameco.com/common/pdf/australia/kintyre/Cameco_4_Newsletter.pdf
75. http://www.mapw.org.au/files/downloads/Nuclear_power_and_public-health_MAPW.pdf
76. http://www.ncbi.nlm.nih.gov/pubmed/14610281
77. http://www.ianfairlie.org/news/a-100-msv-threshold-for-radiation-effects/
78. http://www.cbc.ca/news/canada/saskatchewan/no-money-for-cameco-after-sale-of-ship-that-had-uranium-spill-1.1360155
79. http://www.thestar.com/business/2013/10/31/burning_truck_hauling_nuclear_load_flies_under_radar.html
80. Police investigate radioactive threat from crash, 6 September 2011, www.abc.net.au/news/2011-09-06/radioactive-truck/287329
81. Fatal heavy vehicle crashes quarterly bulletin, October - December 2010 http://www.bitre.gov.au/publications/07/Files/FHVCA_Dec2010.pdf
82. Cost of road crashes in Australia 2006, www.bitre.gov.au/publications/48/Files/Cost_of_road_crashes_in_Australia.pdf
83. Raftery SJ, Grigo JAL, Woolley JE, 2011, Heavy vehicle road safety: Research scan, Centre for Automotive Safety Research, http://casr.adelaide.edu.au/casrpubfile/1099/CASR100.pdf
84. Truck accident deaths soar in Vic, 15 February, 2011, www.industryupdate.com.au/focus-corner/article/560
85. WA Auditor General's Report, Report 4 – June 2005, Regulation of Heavy Vehicles.
86. Tomlin, S., Tough Uranium Stance, Kalgoorlie Miner, Wednesday October 26 2011, pp.1, 3
87. Legislative Council, Question on notice, Tuesday, 9 November 2010, 3012- Hon Robin Chapple. Answers from the Minister for Mines and Petroleum the Hon. Norman Moore- received Thursday 2 December 2010.
88. http://www.abc.net.au/news/2013-12-09/police-probe-great-northern-highway-chemical-spill/5144608/?site=kimberley
89. http://www.abc.net.au/news/2013-11-19/truck-and-car-collide-on-tonkin-highway-intersection/5102410
90. http://www.abc.net.au/news/2013-11-12/highway-could-remain-closed-for-up-to-three-days-following-crash/5085154
91. http://www.abc.net.au/news/2013-10-24/road-train-driver-survives-muchea-crash/5043630
92. www.world-nuclear.org/info/inf48.html
93. http://tiny.cc/0fxgu
94. Campaign Capital, Capital Report, July 2011, 'Opposition to uranium mining increases post-Fukushima', www.campaigncapital.com.au
95. http://prosperitysaskatchewan.wordpress.com/2012/07/31/cameco-puts-kintyre-mine-project-on-ice/
96. 24 Jan 2012, 'Posiva: No room for Fennovoima waste in nuclear cave', http://yle.fi/uutiset/posiva_no_room_for_fennovoima_waste_in_nuclear_cave/5295682
97. http://foe.org.au/anti-nuclear/issues/nfc/power-weapons/rgpu
98. Australia does not have a uranium export agreement with Taiwan but supplies uranium to Taiwan via the US.