

## Summary of submission

Toxic chemical emissions not only harm rock art, they adversely affect the health of people, animals and the environment.

Rock art on Burrup Peninsula is unique in the world and must be protected for:

1. future generations
2. long-term tourism revenue
3. Australia's international reputation.

A truly civilized society would not situate heavy-polluting industries in close proximity to an area of unique world significance. Alternative Burrup sites are available. A disregard for our cultural heritage, people and environment is NOT a message Australia should give the world.

The diversity of the >one million petroglyphs record more than 40,000 years' of human habitation – they are the oldest rock engravings in the world and have the oldest depiction of the human face in the world! Hence, they are an international treasure for all peoples. They must be recognised as such and protected from further degradation.

Rock art and the environment are being degraded. This is the result of shamelessly flawed research that gave inaccurate results to allow the fertiliser plant and TANPF to operate.

Tourists will not visit rock art if: there are unhealthy industry emissions; the rock art degrades; unique flora and fauna disappear and pools are clogged with algae.

The WA government should capitalise on the unique heritage value of the rock art via long-term tourism income rather than very short-term industry revenue.

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I address the terms of reference:

- a. Total industrial pollution load from existing industrial activities and port zone on the Burrup Peninsula WA and its existing impacts on Aboriginal rock art.
  - The critical acid load for rock art is less than 25meq/m<sup>2</sup>/year. This level is currently being exceeded by existing Burrup industries.
  - Yara's proposed acid load on the environment is 200meq/m<sup>2</sup>/year – it tops the international scale! The figure is based on flawed science, explained in point c. An acid load of this magnitude damages granite and feldspar rocks (like Burrup types) around the world.
  - Yara must outline mitigation strategies with meticulous detail on how emissions from the fertiliser and ammonium nitrate plants will be zero for ammonium nitrate particles and the total acid load will be significantly LESS than 25 meq/m<sup>2</sup>/yr.
  - The impact of emissions and leaks on rock art and the environment is not known as appropriate monitoring is not being carried out.
  
- b. Projected additional pollution load from Yara Pilbara Fertilisers PL Technical Ammonium Nitrate Production Facility (TANPF), including likely impacts on rock art, human health and environment.
  - Proposed emissions by TANPF are extreme at: 25.2t/year PM<sub>10</sub> sized ammonium nitrate dust (>600 tonnes over facility lifespan); 135t/year NO<sub>x</sub>; 163.7t/year nitrous oxide; 19.6 t/year ammonia and, 41t/year carbon monoxide. These are minimum estimates, as they omit emissions from conveying, storage and transport of nitrate prills.
  - Proposed emissions are excessive for human and animal health, the future of the rock art and the unique vegetation on the Burrup Peninsula.
  - Evidence shows airborne ammonium nitrate particles, inhaled or ingested, are toxic to humans at concentrations BELOW Yara's proposed output.
  - Local Aboriginal people have complained of ammonia smell and stinging eyes when they are downwind of the current fertiliser plant (*pers com* John Black).
  - Nitrogen, as nitrates and NO<sub>x</sub>, stimulates microbial and fungal growth on the rocks and engravings and will degrade the depictions. Pools and streams on Burrup already show excessive algal growth.
  - Acid negatively affects rocks and rock art. Surface acidity on the Burrup's rocks has increased from pre-industry to the last reported measurements in 2007. John Black has shown Gillett's (2008) estimate of tolerable acid load on Burrup rocks is not correct.
  - Emissions are excessive and are cumulative, giving ongoing and increasingly detrimental impact on rock art, the environment and human health.
  - Yara has the burden of proof to show, fully and scientifically, that emissions are not harmful.
  
- c. Accuracy and adequacy of reports used by WA and Commonwealth governments when setting relevant technical, environmental and cultural conditions regulation construction and operation of TANPF in an area of highly significant Aboriginal rock art.
  - YARA Pilbara Fertilisers PL submitted an amendment application for two existing licences but did not identify the amendments. In light of this deficit, the WA government Department of Environment and Regulation's request for public comment was simply unreasonable.
  - My serious concern is the science used to justify that TANPF emissions would not affect rock art , CSIRO (2008). There was NO statistical analysis of results – anathema in research – plus measurements were based on an incorrect sensitivity map and proposed critical loads.
  - Statement in the original documentation from the WA government (EPA 2011): '*... it is unlikely that the relatively small quantities of NO<sub>2</sub> and NH<sub>3</sub> that would be emitted from*

*TANPF would have a significant impact on rock art in the surrounding areas'*. Similar statements made by Yara ([www.yara.com.au](http://www.yara.com.au)) and Roebourne Shire are based on CSIRO research, Gillett (2008), measuring colour and mineral changes on rock art sites since 2004.

- Much of my work is evaluating research proposals. I confirm the original approval of TANPF by WA government was based on inadequate, seriously flawed scientific evidence Gillett (2008). It should not have passed scrutiny (if there was any) as a proposal for research. For example, critical load was used from Cinderby *et al* (1998). This critical load applies to soils and NOT to rocks. Again, there is no statistical analysis of results, therefore the research cannot be cited with authority. It appears it was a deliberate waste of taxpayers' money.
  - Professor John Black AM, an internationally celebrated research scientist, reanalysed the data in Gillett (2008). He found substantial – statistically significant – changes to colour of rocks and engravings on the Burrup Peninsula. Additional emissions from the ammonium nitrate plant will accelerate this rock art damage.
  - The WA government Department of Environment and Regulation has blocked Professor Black from publishing his reanalysis in a refereed scientific journal. An eminent researcher and valid science are being silenced. Why?
- d. Rigour and adequacy of monitoring, analysis, compliance and enforcement by WA and Commonwealth government agencies in carry out their legislated responsibilities in overseeing industries on the Burrup Peninsula.
- The WA government committee, Burrup Rock Art Technical Working Group, has been disbanded leaving no assurance monitoring of rock art will continue. Continued monitoring of colour and mineral changes on rock art is essential, as is monitoring emissions, chemicals, pH, microbial growth on rocks, plus changes to soil, water and vegetation.
  - There are major errors in Yara's compliance reports to the WA Government and company responses are inadequate. Yara cannot be relied upon to deliver credible reports on their environmental measurements.
  - Yara must furnish projected levels of fugitive gas and nitric acid leaks from the fertiliser plant and TANPF, their effects on human health, likely effects on rock art, animals and the general environment.
  - Yara has a record for large uncontrolled and fugitive emissions from the fertiliser plant and during commissioning of the ammonium nitrate plant.
  - Yara has reported many OH&S incidents, including 24 in 2015 and eight in 2016. During an incident in March 2016, ammonia release reached 14 tonnes.
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- The WA government has been negligent in accepting substandard, inadequate reporting and other documentation from Yara.
- e. Failure by Yara Pilbara, WA government or Federal Government to include risk analysis of establishing TANPF in close proximity to rock art, a gas hub and major port in a cyclone surge zone.
- This failure is similar to not analysing research in that it is totally unacceptable, negligent and arrogant. However, the potential for catastrophic harm from e. to all animals, plants, the environment and rock art is immeasurably greater.
- f. Adequacy of Yara Pilbara plans to protect communities of Dampier and Karratha, and rock art sites, from the consequences of any explosion caused by sympathetic detonation or other factors, including the ability to douse the nitrate stores with sufficient water to prevent a spontaneous explosion.

- Yara documentation has many omissions and inconsistencies, for example it does not cover the very real risk of explosion, a negligent oversight. Similar explosions have occurred around the world with devastating and ongoing outcomes for human life, animals, the environment and property. What would one do to rock art? Alarming, there are no adverse-impact mitigation strategies. It does not cover risks of carbon monoxide poisoning to humans, animals and plants.
- Considering the ramifications of potential impacts, documentation is written in a 'who cares anyway?' manner and is an embarrassment to read.

g. Related matters

- The WA government must abide by Section 4A of the Environmental Protection Act 1986:

*The precautionary principle*

(a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment

(b) an assessment of the risk-weighted consequences of various options

*The principle of intergenerational equity*

The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

- Tourists will be deterred from visiting the rock art if: there are unhealthy industry emissions; the rock art degrades; unique flora disappears and pools are clogged with algae. Better for all if the WA government recognises, and capitalises on, the unique heritage value of the rock art via long-term tourism income rather than very short-term industry revenue.

## References

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