



27^h January 2017

Out Reference: APH270176BH

Christine McDonald
Secretary
Environment and Communications References Committee
PO Box 6100
Parliament House
ACT Canberra 2600

Dear Christine,

**RE: INQUIRY INTO THE PROTECTION OF ABORIGINAL ROCK ART OF THE
BURRUP PENINSULA**

Thank you for the invitation to Yara Pilbara to provide a submission to the Senate Environment & Communications Reference Committee for the above inquiry. Yara Pilbara's submission is attached.

Please do not hesitate to let me know if we can provide any further information to the Committee. Similarly, if hearings are held by the committee Yara would welcome the opportunity to participate.

Yours Sincerely,

Brian HOWARTH

Health, Environment, Safety & Quality Manager

Yara Pilbara Fertilisers Pty Ltd

Yara Pilbara Nitrates Pty Ltd

Attachments

1. 250-996-REP-YPF-0001 Senate Inquiry into Burrup Rock Art - Submission

Yara Pilbara

Postal Address

PO Box 5009
Perth WA 6000
Australia

Visiting Address

Lot 564 Village Road
Burrup Peninsula WA 6714
Australia

Telephone

+61 8 9183 4100

Facsimile

+61 8 9185 6776

Perth Office:

Level 5,
182 St. Georges Terrace
Perth WA 6000, Australia
Telephone: +61 8 9327 8100
Facsimile: +61 8 9327 8199



Yara Pilbara

Submission to the Parliamentary Inquiry into the Protection of Aboriginal Rock Art on the Burrup Peninsula

25th January 2017

Yara Pilbara

Postal Address
Locked Bag 5009
Karratha, WA 6714
Australia

Visiting Address
Lot 564, Village Road
Burrup, Western Australia
WA 6714

Telephone
+61 8 91834100
Facsimile
+61 8 9185 6776

Registered Office:
Level 5,
182, St. George Terrace Perth
WA 6000, Australia
Telephone: +61 8 9327 8100
Facsimile: +61 8 9327 8199



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1 Introduction

The Yara group of companies (**Yara**), which is headed by Yara International ASA, is pleased to present this submission to the Parliamentary Inquiry by the Senate Environment and Communications References Committee into the Protection of Aboriginal Rock Art on the Burrup Peninsula.

2 Background

2.1 Yara at a Glance

Figure 1: Yara International at a glance



2.1.1 Key figures 2015

- **Total Deliveries:** 35.7 million tons.
- **Fertiliser sales:** 26.5 million tons.
- **Industrial sales:** 7 million tons (including feed phosphates and CO₂).
- **Employees:** approximately 13,000

2.1.2 Key facts

- Established as Norsk Hydro in 1905, demerged as Yara International in 2004.
- President and CEO since September 2015: Svein Tore Holsether.
- Headquartered in Oslo, Norway. Listed on the Oslo Stock Exchange.

2.1.3 Production

Yara is the world's largest producer of ammonia, nitrates and NPKs (Nitrogen, Phosphorous, Potassium), providing the foundation of Yara's fertiliser and industrial solutions.



2.1.4 Crop Nutrition Solutions

Yara is the leading provider of sustainable crop nutrition solutions, supporting farmer profitability through knowledge, optimal quality and productivity. Yara uses its global and local agronomic, marketing and sales knowledge to sell its quality products to more than 150 countries worldwide.

2.1.5 Nitrogen Applications and Environmental Solutions

Yara also has a leading position in nitrogen applications, and has become a total solutions provider in the market for emission control solutions. Its industrial solutions include:

- Reagents and solutions to reduce emissions from plants, ships, trucks and cars.
- Nitrate-based chemicals with applications ranging from renewables to the pharmaceutical industry.
- Solutions for the civil explosives industry.
- Solutions for animal feed.

2.2 Yara Pilbara Structure

The ammonia plant on the Burrup Peninsula (**Ammonia Plant**) is owned, operated and managed by Yara Pilbara Fertilisers Pty Ltd (**YPF**), a wholly owned subsidiary of Yara Pilbara Holdings Pty Ltd (**YPH**). YPH is, in turn, a wholly owned subsidiary of Yara Australia Pty Ltd.

Yara is a 55% joint venture partner with Orica Limited (**Orica**) (45%) in Yara Pilbara Nitrates (**YPN**), the entity currently commissioning a USD800 million Technical Ammonium Nitrate (**TAN**) production facility (**TAN Plant**) located adjacent to the Ammonia Plant.

The TAN Plant is due to become operational in 2017 and aims to supply TAN to mining customers in the Pilbara region of Western Australia. Operational control of both the Ammonia and TAN Plants is maintained by Yara. Orica is responsible for the marketing of the TAN through a separate incorporated joint venture.

2.3 Operational Summary

The Ammonia Plant is located within the Burrup Strategic Industrial Area on the Burrup Peninsula of Pilbara in the North West of WA. It is approximately 1,600 km north of Perth, WA. The Ammonia Plant is situated within a 72 hectare leased area.

The ammonia production process is based on Kellogg Brown Root's Purifier Process™, a low energy natural gas reforming process. Feedstock for producing the ammonia is natural gas received from the Dampier Bunbury Natural Gas Pipeline (**DBNGP**) through a pipeline and metering station. The ammonia produced is stored at -33°C and at atmospheric pressure, in two double-walled storage tanks, each with a design capacity of 40,000 tonnes.



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The Ammonia Plant's minimum nameplate production guarantee is 2,200 tonnes per day anhydrous ammonia. This rate is subject to fluctuation based on various conditions, such as quality of raw natural gas feed, ambient temperature and activity of the catalyst in the process, and an ammonia production of between 2,500 to 2,600 tonnes per day can be achieved. The ammonia product is transported from the storage tanks via above ground transfer pipelines for shipping to markets within Australia or overseas. Ammonia will also be transferred through an 879 m long, 100 mm diameter above ground insulated pipeline to the adjacent TAN Plant when it becomes operational.

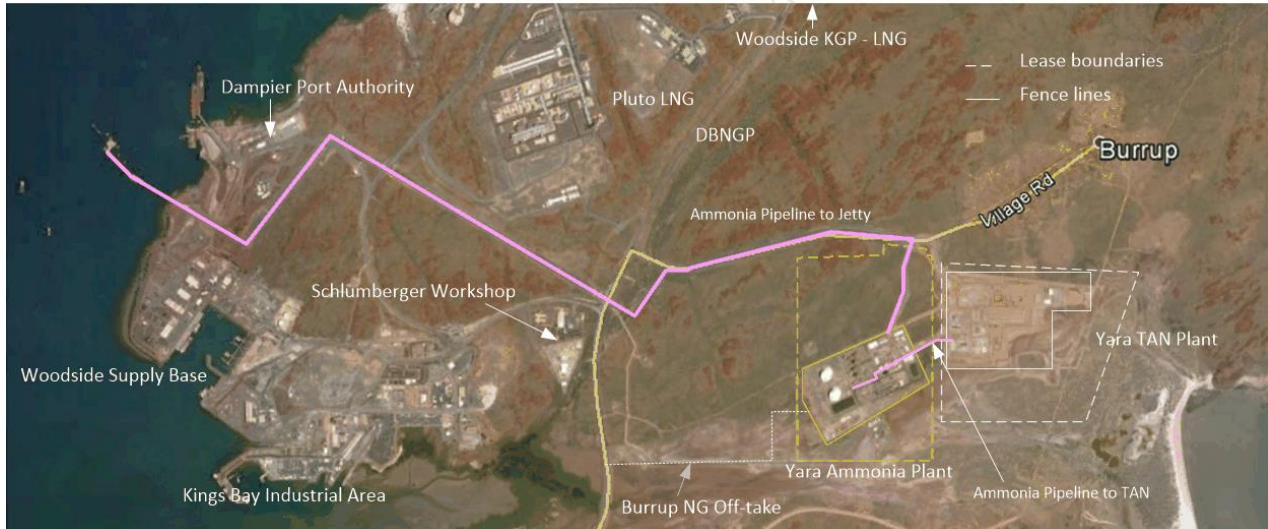
The ammonia ship loading and recirculation pipeline crosses underneath Burrup Road and continues west to enter the Bulk Liquids Berth (BLB) at the port of Dampier. The ammonia transfer pipeline traverses through the Ammonia Plant to the TAN Plant, crossing the eastern boundary of the leasehold site on which the Ammonia Plant is situated and the western boundary of the leasehold site on which the TAN Plant is being constructed. The land on which the Ammonia Plant, the TAN Plant and the various pipelines and ship loading facilities associated with their operation are located is designated for industrial use as per the Burrup Strategic Industrial Area, according to the then Shire of Roebourne - Town Planning Scheme, which is administered by LandCorp.

The TAN Plant will have a production capacity of 350,000 tonnes per annum (TPA) of TAN and is located on a 48.8 hectares site adjacent to the Ammonia Plant. The proximity of the Ammonia Plant to the TAN Plant allows the sharing of services and utilities that reduce environmental impacts through a smaller project footprint. Once operational, TAN will be produced with best available technology and will utilise the following proved process:

- ammonia and oxygen are mixed and superheated to create nitric acid;
- nitric acid and ammonia are combined and superheated to produce ammonium nitrate solution; and
- ammonium nitrate solution is concentrated and sent to a prilling tower where droplets of ammonium nitrate solution fall from the top of the tower and crystallise to produce small solid prills or beads, which are then dried, coated and stored.



Figure 2: Location of the Ammonia Plant and TAN Plant infrastructure within the Burrup Strategic Industrial Area



2.4 Yara's Commitment

Yara has demonstrated its commitment to Australia through its investment and operations in the Pilbara region. Australian governments are committed to developing downstream processing industries to create local employment and to help add value to the nation's natural resources. Our company is advancing these objectives by adding value to a key Australian resource through dual processing of Australian resources and by generating exports. Natural gas is converted to ammonia, some of which is then further processed to create TAN. Uniquely, that TAN is then used to enable the mining of other Australian resources, most notably, iron ore.

The Pilbara operations also support one hundred and eighty direct Yara employees and we contribute over AUD70m into the local economy annually. During peak construction of the TAN Plant there were also five hundred contractors on-site.

Yara is proud to be part of the local Pilbara community. We have made a decision not to pursue a fly-in/fly-out model for our operations. YPF and YPN (collectively referred to as **Yara Pilbara**) has a residential workforce and our workers and their families live in one hundred and ten homes in Karratha and Dampier. Sixty five of these homes were built by Yara Pilbara through an AUD50 million construction program which was completed using Western Australian builders, including those based in the Pilbara region.

Yara Pilbara is also investing in training and employment opportunities. In particular, we are targeting the local community through initiatives such as the offering of twelve apprenticeships and traineeships to date; with a further five positions to be offered in 2017. Our three year graduate engineer program provides skills development training for eight WA engineers. Yara Pilbara's focus is not just on our operations. Yara Pilbara provides scholarships to local high schools, supports



community organisations and charities – while our employees and their families are actively involved in community events.

Yara also aspires to be a global leader in sustainable agriculture and environmental solutions, a goal which has also been embraced by our Pilbara operations. Late last year, Yara agreed to provide the majority funding for a feasibility study in establishing a Sahara Forest Project for producing high value commercial food, water and energy through the use of salt-water cooled greenhouse technology at a semi-arid site near Karratha. The Sahara Forest Project uses a combination of environmental technologies to enable creation of green jobs through profitable production of food, freshwater, biofuels and electricity.

In 2016, Yara also began pre-engineering studies and approvals for a renewable hydrogen pilot plant on the Burrup Peninsula. The pilot plant will be located on Yara Pilbara's current facilities and is designed to determine the viability of utilising solar power and seawater to generate hydrogen, a key component of ammonia. This pilot plant will aim to produce "green" ammonia that, if viable, could substantially reduce carbon dioxide emissions associated with the production of ammonia.

2.5 Yara Pilbara – Health, Safety and Environmental Compliance

Health, Environment and Safety are Yara Pilbara's top priorities and we run our operations in a manner to enable compliance with all local, State and Federal licensing and regulatory requirements and our own rigorous global standards. Our combined Pilbara operations, including the new TAN Plant, are subject to numerous Federal and State legislative instruments which require a range of approvals, licenses, inspections, audits and reports.

Yara has been operating industrial plants for more than a century and currently has over thirty production sites (including in joint venture) across the world. This experience helps guide our Pilbara operations in areas such as process knowledge and experience, plant design and technology.

Yara also invests heavily in research and development. These endeavours have delivered innovations such as the company's proprietary cleaning technology – both the NO_x catalyst and the N₂O catalyst – which enables us to reduce the emission of these gasses from industrial plants by up to 90 percent.

Further, Yara has undertaken equipment enhancements, increased maintenance activities and a number of process improvements since taking over as operator of the Ammonia Plant in 2012.

Safety has also been at the forefront in design of the TAN Plant which incorporates Yara's global experience, best available operating technology and a range of specific safety measures including early detection/warning systems, infra-red cameras, firewalls, deluge systems, fire resistant rooms and secondary containment/bund walls.



2.6 Yara Pilbara – Rock Art / Aboriginal Culture

Yara has great respect for not only the rock art of the Burrup but the traditional owners in the region.

Yara actively promotes understanding of the rock art and Aboriginal culture within our workforce and for those contractors who visit our operations. There are clear guidelines and processes which need to be followed by employees and contractors to prevent any disturbance. Yara Pilbara also has monitoring in place surrounding their operations and independent monitoring of the rock art is carried out on a regular basis.

Three air-quality stations are located around the plant area, including in the vicinity of the rock art. These sites, and an additional three sites, are also monitored regularly by the Commonwealth Scientific and Industrial Research Organisation (**CSIRO**) to check colour contrast and spectral mineralogy under the oversight of the WA Government appointed technical advisory group - Burrup Rock Art Technical Working Group (**BRATWG**).

Yara's commitment to the unique heritage and culture of the Burrup Peninsula is further demonstrated by its support of the proposed establishment of a Living Knowledge Centre by the Murujuga Aboriginal Corporation, as communicated during Yara's participation by invitation at the Murujuga Strategic Planning Session in July 2016, and in subsequent correspondence sent in September 2016.



3 Summary of Yara's Submission to the Committee

It is Yara's submission that:

- To date, there is no credible scientific evidence to indicate that existing industrial emissions have had any measurable impact on the rock art on the Burrup Peninsula.
- The established monitoring regime for rock art is rigorous, has been modified to take account of potential issues raised by concerned parties, and is adequate to provide an early warning of any possible impacts from industrial emissions.
- The approvals process for the Yara Pilbara TAN plant was robust and underpinned by credible reports prepared by experienced and suitably qualified specialists.
- Projected gas emissions from the Ammonia and TAN Plants (which emissions include those resulting from start-ups, shut-downs and upset conditions) have been assessed as part of relevant approval processes and are not expected to have any significant impact on rock art.
- Reportable nitric acid leaks are not planned to occur at the TAN Plant and Yara Pilbara has responded to any incidents that may have occurred during commissioning in a manner which often exceeds the reporting requirements of applicable WA Department of Environment Regulation (**DER**) and WA Department of Mines and Petroleum (**DMP**) regulations.
- Appropriate analysis of relevant risks associated with the establishment of the TAN Plant occurred during the approvals process.
- Yara Pilbara has appropriate and adequate plans, systems and infrastructure to prevent an explosion caused by sympathetic detonation or other factors, including fire protection (dousing) systems.



4 Specific Responses to the Terms of Reference

4.1 Term of Reference A

a) The total industrial pollution load from existing industrial activities and port zone on the Burrup Peninsula in Western Australia, and its existing impacts on Aboriginal rock art.

The total industrial emission load on the Burrup Peninsula is a matter that has been addressed in detail in the various proposals and approval documents submitted by Yara Pilbara (and presumably others who engage in industrial activities in the area)¹. Accordingly, it is a matter that has been presented for consideration during the course of the relevant approval processes.

Yara Pilbara shares the broad community expectation that the unique Aboriginal heritage values of the Burrup Peninsula remain unaffected by industrial activities. Yara is committed to ongoing monitoring and investigations of rock art nearby to its operations to ensure that its environmental and heritage protection measures remain effective and to adapt these measures as may be required in response to scientific data.

Yara Pilbara continues to contribute to independent and scientifically rigorous long term monitoring and investigation studies on Aboriginal rock art on the Burrup Peninsula.²

In response to concerns expressed about possible adverse impacts on the Burrup Rock Art by industrial emissions to air, the WA Government established the Burrup Rock Art Monitoring Management Committee (BRAMMC) in 2002. This Committee commissioned a number of investigations to establish whether industrial emissions are or could have adverse impacts on the rock art on the Burrup Peninsula. A range of studies were initiated including:

- annual independent monitoring by CSIRO of colour change and spectral mineralogy of Burrup rock art³;
- CSIRO undertaking air quality monitoring in 2004–2005 and 2007–2008 to assess the likelihood that air pollution from the industrial area may damage rock art⁴;
- air dispersion modelling of atmospheric pollutants was modelled in 2009 to allow a better understanding of the potential for emissions from local industry to impact upon Burrup rock art⁵;

¹ See, for example, Technical Ammonium Nitrate Facility, Burrup Peninsula. Burrup Nitrates Pty Ltd. Environmental ;Protection Authority. Perth, WA. Report 1379, January 2011. Department of Environmental Protection (2002) Monitoring of Ambient Air Quality and Meteorology during the Pilbara Air Quality Study. CSIRO (2008) Burrup Peninsula Air Pollution Study: Report for 2004/2005 and 2007/2008. ERM (2012) TANPF Air Quality Assessment Update.

² Burrup Rock Art Technical Working Group (2015) 5 Year Review Draft. Unpublished Report (page 3, para' 2)

³ D.Lau, E. Ramanaidou, A Hackett, M Caccetta, S.Furman (2010) Burrup Peninsula Aboriginal Petroglyphs: Colour Change and Spectral Mineralogy 2004-2009. CSIRO Restricted Report P2010/408 CMSE(C)-2010-059

⁴ Burrup Peninsula Air Pollution Study: Report for 2004/2005 and 2007/2008. CSIRO, Gillett, 2008.



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- a study by Murdoch University between 2004 and 2008 into the possibility that microbial activity perhaps stimulated by deposition of air pollutants could accelerate surface corrosion⁶; and
- accelerated erosion tests conducted by CSIRO between 2004 and 2007 using fumigation chambers to assess the impact of different pollutant scenarios, and to evaluate the role that dust may play in rock surface modification;⁷ (Further CSIRO extreme exposure tests have commenced through BRATWG following issues raised by Friends of Australian Rock Art (**FARA**) regarding the original test samples).

BRAMMC reported the CSIRO and other results to the WA Minister for Environment in 2009⁸. It concluded from these studies that there was no scientific evidence that indicates measurable impacts to rock art from industrial emissions on the Burrup Peninsula.

Based on the recommendations of BRAMMC, the WA Minister for Environment established BRATWG in September 2010. BRATWG is an independent technical group to manage and coordinate the continued monitoring of rock art on the Burrup Peninsula and reporting with funding from existing Burrup industries. Yara Pilbara has been a major financial contributor to BRATWG since Yara assumed control of the operations and management of the Ammonia Plant in 2012.

It is important to note that BRATWG has not only engaged with those involved in running the industry on the Burrup Peninsula, but also with other interested parties, such as FARA. The independence of BRATWG is evidenced by this engagement and the willingness of BRATWG to incorporate input from FARA with respect to the manner in which BRATWG's monitoring activities were conducted⁹.

5 Burrup Rock Art Revised modelling taking into account recent monitoring results. SKM, 2009

6 Monitoring of Microbial Diversity on Rock Surfaces of the Burrup Peninsula; Final Report to Burrup Rock Art Monitoring Management Committee. Principal Investigator: Dr Graham O'Hara, School of Biological Sciences and Biotechnology, Murdoch University. September 2008

7 Field Studies of Rock Art Appearance, Final Report: Fumigation and Dust Deposition, Progress report: Colour Change and Spectral Mineralogy; CSIRO : Deborah Lau, Erick Ramanaidou, Scott Furman
Ivan Cole, Tony Hughes, Pam Hoobin, 2007.

8 Burrup Rock Art Monitoring Committee; Report and Recommendations to the Minister for State Development, April 2009. [http://pandora.nla.gov.au/pan/103684/20090805-1626/www.dsd.wa.gov.au/documents/090115_Burrup_Rock_Report_\(1\).pdf](http://pandora.nla.gov.au/pan/103684/20090805-1626/www.dsd.wa.gov.au/documents/090115_Burrup_Rock_Report_(1).pdf)

9 Burrup Rock Art Technical Working Group (2015) 5 Year Review Draft. Unpublished Report (page 8, para' 2)



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BRATWG completed its five year term of engagement in 2016 and has prepared a draft of its findings and recommendations to the WA Minister for Environment. In its draft report, BRATWG has concluded, consistent with the earlier findings of BRAMMC, that there is no scientific evidence that indicates any measurable impact of industrial emissions on the rock art on the Burrup over the period 2004 to 2014. The report also contains a recommendation that the monitoring of rock art continue on an annual basis to provide an early warning of any possible impacts to rock art from industrial emissions and recommended that the function of BRATWG continue for another five year term¹⁰.

Whilst Yara Pilbara is currently awaiting the final BRATWG Report and Recommendations to the Minister, Yara Pilbara supports the recommendations contained in the draft report and the ongoing operation of BRATWG as an effective independent group to facilitate the monitoring and analysis efforts. Further, it is Yara Pilbara's preference that the ongoing program of monitoring Aboriginal rock art and air quality at three locations surrounding the TAN Plant, as required through its approval commitments, be undertaken within the BRATWG framework and is coordinated with other Burrup industry monitoring efforts.

10 Burrup Rock Art Technical Working Group (2015) 5 Year Review Draft. Unpublished Report (page 3, para' 2)



4.2 Term of Reference B

b) The projected additional pollution load from the Yara Pilbara Fertilisers Pty Ltd ammonium nitrate plant, including the likely impacts on the Aboriginal rock art, human health and the environment

YPN incorporated best practice pollution control technology in the TAN Plant design with the aim of achieving emission concentrations of ammonia and ammonium nitrate dust from the prilling tower and drum drier common stack below the levels stated in the Fertilizers Europe and European Commission best practice guidelines. It is considered that these guidelines (which have been incorporated into the DER issued Works Approval for the TAN Plant¹¹) represent the benchmark in describing best practice for industry on a global scale¹².

The predicted emissions from the TAN Plant were assessed through Commonwealth and State environmental impact assessment processes and formal approval conditions prescribing air emission mitigation and monitoring have been established by both regulators to ensure the protection of human health, the environment and the rock art of the Burrup Peninsula.

Importantly, the WA Environmental Protection Authority (**EPA**) has concluded that the predicted emission of waste gasses from the TAN Plant is unlikely to have a significant impact on cumulative annual average concentrations of these gasses and is therefore unlikely to have a significant impact on rock art¹³.

YPN's most recent predictions of impacts to air quality dispersion are based on air dispersion modelling completed in 2012 using the latest manufacturer guarantees on emissions from the proposed best practice technologies adopted by YPN plant together with background emissions considered through historical monitoring and modelling.

The updated air quality modelling considered two scenarios - normal operation and non-routine operations of the TAN Plant. Outputs from the dispersion model were combined with background concentrations measured in the local area. The combined results were then compared to the adopted assessment criteria as approved through the Commonwealth and State assessment processes referred to above.

¹¹ Page 5, Works Approval W4701/2010/1 Yara Pilbara Nitrates Pty Ltd, TANPF, July 2013

¹² Page 12 YPN Burrup Technical Ammonia Nitrate Production Facility Air Quality Management Plan February 2013, ERM Ref 0086269

¹³ Page iii and page 16: Technical Ammonium Nitrate Production Facility, Burrup Peninsula: Report and Recommendations of the Environmental Protection Authority. Bulletin 1379, January 2011.



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The adopted air quality criteria are derived from the Ambient Air Quality NEPM¹⁴, the NSW DECC guidelines¹⁵ and CSIRO criteria¹⁶ for acid deposition impact on rock art on the Burrup Peninsula. The air quality criteria include those for the protection of human health, the environment and the protection of Aboriginal rock art.

The results indicated that for normal operations, predicted concentrations for all modelled gasses and for acid deposition at rock art sites were below the adopted assessment criteria. This indicates that during normal operation there would be no harm to the beneficial use of the atmosphere, specifically human health and the environment, and that impact to rock art in the local area is unlikely.¹⁷

¹⁴ National Environmental Protection Measure and Impact Statement for Ambient Air Quality, National Environmental Protection Council, 1998.

¹⁵ Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales, NSW EPA, 2000.

¹⁶ Burrup Peninsula Air Pollution Study: Report for 2004/2005 and 2007/2008. CSIRO Marine and Atmospheric Research, 2008.

¹⁷ Burrup Peninsula Technical Ammonium Nitrate Production Facility: Air Quality Assessment Update, ERM, Draft 17/8/2012



4.3 Term of Reference C

c) The accuracy and adequacy of reports used by the Western Australian and Commonwealth governments when setting the relevant technical, environmental and cultural conditions regulating the construction and operation of the Yara Pilbara Fertilisers Pty Ltd ammonium nitrate plant in an area of highly significant Aboriginal rock art;

Yara Pilbara engages suitably qualified and experienced specialist consultants and internal specialists in the preparation of accurate and scientifically credible reports submitted to Commonwealth and WA State regulatory bodies in regards to environmental, safety and cultural heritage assessments and approvals. Yara Pilbara's experience is that the statutory processes for submission of information for Government regulator consideration includes guidance for industry on the quality and detail of technical information required to be submitted in support of approval applications¹⁸. Moreover, it is Yara Pilbara's observation that, in the present case, significant regard has been had to the research of Australia's peak scientific body (CSIRO) and other peer reviewed research.

¹⁸ See EPA Guidelines for submissions at: http://edit.epa.wa.gov.au/Policies_guidelines/EAGs/Pages/default.aspx



4.4 Term of Reference D

d) The rigour and adequacy of the monitoring, analysis, compliance and enforcement performed by the Western Australian and Commonwealth government agencies in carrying out their legislated responsibilities in overseeing industries on the Burrup Peninsula;

Reference is made earlier in this submission to the extensive independent monitoring, analysis and research that has been conducted by BRAMMC and BRATWG, whose monitoring, analysis and research has involved highly qualified and experienced organisations.

The BRATWG terms of reference clearly require the engagement of key stakeholders in regard to rock art monitoring. This engagement has included detailed discussions with FARA concerning the CSIRO research approach and findings. BRATWG's consideration of the matters raised by FARA resulted in a number of modifications to the study and reports. A "power analysis" was carried out by CSIRO to assist with designing an accelerated weathering test program, commenced in 2016, involving the two main rock types (gabbro and granophyre) and industrial chemicals from the range of industries including ammonium nitrate due to the construction of the Yara ammonium nitrate plant. In 2014, a fourth engraving and background spot pair was added to the CSIRO rock art colour change monitoring to increase the accuracy of statistical analysis measurements in response to requests from FARA.¹⁹ Most recently, in the BRATWG March 2016 meeting, CSIRO and other stakeholders discussed the results of re-analysis of the colour change and mineralogy changes from 2004 to 2014 undertaken by Black and Diffey. BRATWG requested Black and Diffey to undertake additional statistical analysis in response to CSIRO's comments. It is Yara's understanding that, in CSIRO's professional opinion, the revised model submitted by Black and Diffey did not address the errors previously identified by the CSIRO and that therefore the statistical conclusions made in the re-analysis are thus based on modelling that is incorrect.²⁰ The BRATWG process provides a proven framework for the consideration of concerns from all stakeholders and the ongoing refinement of the monitoring and research methodology through scientific review.

Given that Yara Pilbara's operations are regulated by the agencies to which this term of reference relates, it is not appropriate that Yara make any further comment.

¹⁹ BRATWG, Five Year Review (Draft), 2015.

²⁰ BRATWG Meeting Minutes 30 March 2016.



4.5 Term of Reference E

e) The projected level of fugitive gas and nitric acid leaks from the Yara Pilbara fertiliser and ammonium nitrate plants, their effects on human health, likely effects on rock art and the general environment, and the adequacy of the company responses;

As noted earlier, projected levels of emissions from the TAN Plant and the Ammonia Plant were predicted and assessed within the relevant statutory environmental assessment undertaken for each facility²¹. These assessments were conducted by reference not only to the emissions from normal operations, but to the non-point source emissions that might be generated by each plant during non-routine operations.

Fugitive dust emissions during the TAN Plant construction phase, including dust generated from site earth works and construction traffic, were assessed in the Public Environmental Review (PER). Requirements for fugitive dust control and monitoring requirements were stipulated in the Construction Environmental Management Plans²². Fugitive dust emissions during construction of the TAN Plant were considered to be effectively managed through the commitments contained in the air quality management plan²³ and were not considered to be significant in terms of impact to human health, the environment or nearby rock art.

The PER for the TAN Plant included predicted emissions of nitrous oxide gasses from filling of nitric acid storage tanks and during plant shutdown. Similarly, natural gas and ammonia emissions from the Ammonia Plant during short term events associated with start-ups, shut-downs and upset conditions have been estimated as contributing 1% and 5% of the total Ammonia Plant emission load respectively.²⁴

The unplanned release of ammonia gas from leaks, pipeline or equipment failure or flaring at the Ammonia Plant has also been considered in various environmental approval and emission licensing submissions²⁵. The likelihood of ammonia gas releases from flaring is very low and is only predicted to occur during a complete blackout scenario when boil-off gas from the storage tanks will be directed to the flare, which is designed to combust ammonia during such unplanned venting. Under such circumstances, process controls are in place to monitor flaring to ensure proper combustion of ammonia.

²¹ Page 106, Section 7.2.1.2, Burrup Ammonia Plant Public Environmental Review, SKM 2001 and, page 74: TAN Production Facility Public Environmental Review for Burrup Nitrates Pty Ltd.

²² Page 7, TANPF, Air Quality management Plan, ERM, 2013: http://www.yara.com.au/images/2-250-329-PRO-TRE-0111%20Construction%20Environmental%20%20Management%20Plan_tcm583-240488.pdf

²³ Page 15, DER Works Approval decision document TAN Plant, Works Approval W4701/2010/1, 2013

²⁴ Page 27 Fig.12 Burrup Fertilisers Fugitive Emissions Inventory, GHD, 2008.

²⁵ Page 107, Burrup Fertilisers PER, SKM, 2001; and: page 19 DER Decision Document: L7997/2002/1



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Ultimately, the assessments that have been conducted conclude in respect of each plant that predicted emissions are unlikely to have a significant impact on human health, rock art and the general environment²⁶.

Reportable nitric acid leaks are not planned to occur at the TAN Plant. YPN submitted two Dangerous Goods Incident Report Forms pertaining to nitric acid incidents during commissioning in 2016 (1 May 2016 and 3 October 2016). A number of other incidents during commissioning involving nitric acid, that did not exceed the reportable quantities and were not required to be reported²⁷, were nevertheless drawn to the attention of the authorities. These commissioning incidents were the result of localised spills which were effectively remediated with no identified impacts to human health, the environment or to offsite heritage values.

²⁶ Technical Ammonium Nitrate Production Facility, Burrup Peninsula: Report and Recommendations of the Environmental Protection Authority. Bulletin 1379, January 2011.

²⁷ WA Department of Minerals and Petroleum Report Dangerous Goods Incident Guidelines (6th edition), 2011.



4.6 Term of Reference F

f) The failure by Yara Pilbara Fertilisers Pty Ltd, the Western Australian Government or the Federal Government to include risk analysis of establishing an ammonium nitrate plant in close proximity to the rock art, a gas hub and major port and in a cyclone surge zone;

Yara rejects the claim that there has been a failure to include adequate risk analysis in the planning and establishment of the TAN Plant. A range of risk assessments have been completed during the planning and design stages for the TAN Plant, as described in the PER²⁸ and other statutory approval submissions. Action plans based on these assessments have been developed and implemented during the project.

The PER described the initial site selection screening study whereby three industrial estates in the Pilbara region were assessed and ranked in terms of suitability for development of a TAN Plant. The assessment process included consideration of Aboriginal heritage, land tenure, environmental sensitivity, suitability for TAN storage and the proximity of communities.

Importantly, the selected site for the TAN Plant was already zoned for strategic industrial use under the then Shire of Roebourne Town Planning Scheme No.8. The industrial precinct that contains the TAN Plant, the Ammonia Plant and Woodside's Pluto LNG Plant had been previously assessed for strategic industrial purposes through the Burrup Peninsula Land Use Plan and Management Strategy²⁹.

The PER for the TAN Plant clearly acknowledged the risks associated with sympathetic explosion and over pressure effects, ammonia gas releases and extreme weather events such as cyclones.³⁰ The PER also makes specific reference to the management measures to be put in place to address the various risks which include (in respect of the risks identified above):

- there being a safe distance between the bulk storage area at the TAN Plant and the ammonia storage tanks located at the Ammonia Plant;
- the elevation of the site to a minimum of 5.5 m above the Australian Height Datum (**AHD**), which is above the 1-in-100 year flood line of 4.8 m AHD;
- the construction of buildings built to handle a wind velocity of 300 km/h in any direction at 10m above ground;

²⁸ Page 14 section 4.4: TAN Production Facility Public Environmental Review for Burrup Nitrates Pty Ltd.

²⁹ Page 14 section 4.4: TAN Production Facility Public Environmental Review for Burrup Nitrates Pty Ltd.

³⁰ Page xvii, table ES.4: TAN Production Facility Public Environmental Review for Burrup Nitrates Pty Ltd.



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- stormwater drains designed for 105 mm/h rainfall;
- incorporating in the design of the TAN Plant the potential for future sea level rise for the 20 year plus operational phase;
- the incorporation of segregation valves in the ammonia pipeline to limit loss of product if a leak occurs; and
- the development of Emergency Response Management Plan covering emergency scenarios during all phases of the TAN Project.



4.7 Term of Reference G

g) The adequacy of the Yara Pilbara plans to protect the communities of Dampier and Karratha and the 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;

YPN has designed and constructed the TAN Plant with consideration of the requirements of the Dangerous Goods Safety Act (2004) as regulated through the DMP. The facility is also governed by the requirements of the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007, the Dangerous Goods Safety (Security Risk Substances) Regulations 2007 and the Dangerous Goods Safety (Major Hazard Facilities) Regulations 2007. YPN has been determined to be a Major Hazard Facility by the DMP³¹. The facility is, therefore, required to operate in accordance with the approved Safety Report, which demonstrates that the site's safety management system includes appropriate controls, mitigation and incident response. The Safety Report approval was received from the DMP on 26th May 2015³².

YPN is committed to the storage of ammonium nitrate products in a manner that avoids sympathetic detonation risk and in accordance with Yara and industry accepted standards.

As noted above, explosion risk was an issue that was specifically considered as part of the planning and development of the TAN Project, and which is the subject of specific management measures to further minimise the risk posed.

The initial management measures identified in the PER have been supplemented following the completion of further risk assessments. The TAN Plant Safety Report defines the full range of risk controls and systems that demonstrate, to the DMP's satisfaction, that the plant can operate safely.

As stated in the response to Terms of Reference (f), the planning and design phases of the TAN plant included comprehensive risk assessments against established risk criteria. The risk assessments were required to demonstrate, to the DMP's satisfaction, that the TAN Plant's proposed location and operation does not pose unacceptable levels of risk to neighbouring land uses, including communities. Importantly, those risk assessments were conducted separately to the preparation of the PER and considered these other risks in great detail.

³¹ Department of Minerals and Petroleum Letter to Yara Pilbara Ref: (000159.Shane,DANIEL): Yara TAN Status as a major Hazard Facility and Resulting Commissioning Requirements, 24 February 2016

³² DMP Letter: Ref X0775/201201, Dangerous Goods Safety (Major Hazard Facilities) Regulations 2007, 26 May 2015.



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A key focus for Yara is prevention of emergency incidents. The TAN Plant's design and safety management system includes provision for mitigation and emergency response. Effective fire prevention and control is critical to the prevention of over-pressure scenarios at the TAN Plant. YPN has designed and installed fire detection and suppression systems. These have been considered in the design reviews conducted for the facility, including as part of the Fire Risk Assessment³³. External consultants have been engaged, as part of the commissioning, to review the fire system design against the design requirements and the requirements of relevant Australian Standards.

In the event of an emergency with offsite potential, Yara Pilbara has emergency response plans that have been developed in consultation with the Department of Fire and Emergency Services. Yara Pilbara is also a member of the Burrup Industrial Emergency Management Advisory Committee which ensures there is a coordinated response to incidents in the area.

³³ TANPF, Fire Risk Assessment, Yara/TR Document: 2-250-329-REP-TRE-8023, TR, 2014.



5 Conclusion

Yara is pleased to take the opportunity to present this submission and address the relevant issues raised in the Terms of Reference.

This submission reflects and supports Yara's commitment to transparency and the provision of factual information regarding our production facilities in the Burrup Strategic Industrial Area.

It also demonstrates that:

- there is no credible scientific evidence to indicate that existing industrial emissions have had any measurable impact on the rock art on the Burrup Peninsula;
- the established monitoring regime for rock art is rigorous, has been modified to take account of potential issues raised by concerned parties; and
- is adequate to provide an early warning of any possible impacts from industrial emissions.

Yara would welcome the opportunity to provide further clarification on the matters presented in this submission should it be requested to do so.