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Nyrstar Port Pirie Smelter Transformation Proposal

Response Document

October 2013

Nyrstar Port Pirie Transformation

Response Document

Prepared for:

Nyrstar Port Pirie Pty Ltd

PO Box 219, Port Pirie, SA 5440

+61 8 8638 1500, www.nyrstar.com

Prepared by:

COOE Pty Ltd (and Associates)

PO Box 591, Littlehampton, SA 5250

+61 8 8398 5090, www.cooe.com.au

Acknowledgement to Associates:

Air Assessments (IJH Holdings Pty Ltd)

Arup Pty Ltd

BlueSphere Environmental Pty Ltd

BMT WBM Pty Ltd

CSIRO Marine & Atmospheric Research - Centre for Australian Weather & Climate Research

SEA - Social & Ecological Assessment Pty Ltd

Michael R. Moore

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Preface

Nyrstar Port Pirie Pty Ltd ('Nyrstar') has prepared this Response Document as part of a process of seeking approvals from the Australian and South Australian Governments to undertake a major development of the smelter in Port Pirie, South Australia.

Community views are a very important consideration for Nyrstar and Government in planning and assessing the proposed Port Pirie Smelter Transformation.

Our future plans for the smelter are based on delivering an innovative and sustainable solution that significantly improves the sites' environmental performance.

Our policy is to provide the foundation for a sustainable business by operating in an environmentally responsible way while focussing on preventing harm to the environment and the community. We recognise the environmental impact from 124 years of continuous operation of the smelter and will focus on addressing legacy issues by applying leading practice, innovation and sound science. We will apply this policy to our approach to the Port Pirie Smelter Transformation.

We thank all those who have contributed to this point and now we welcome a decision on Nyrstar's plans for the Port Pirie Smelter Transformation.

Craig Jetson

General Manager, Port Pirie Smelter

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Glossary

AHD	Australian Height Datum
APVMA	Australian Pesticides and Veterinary Medicines Authority
ARENA	Australian Renewable Energy Agency
carbon intensity	The average emission rate of carbon dioxide from a given source relative to the rate of production, such as tonnes of carbon dioxide emitted per tonne of lead produced.
CEMP	Construction Environmental Management Plan
DAC	Development Assessment Commission (SA)
DEWNR	Department of Environment, Water and Natural Resources (SA)
DMITRE	Department of Manufacturing, Innovation, Trade, Resources and Energy (SA)
DPTI	Department of Planning, Transport and Infrastructure (SA)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Commonwealth) (now the Department of Environment)
EBS	enclosed bath smelter
EC50	half maximal effective concentration – the concentration of a drug, antibody or toxicant which induces a response halfway between the baseline and maximum after a specified exposure time
EFIC	Export Finance and Insurance Corporation
EPA	Environment Protection Authority (SA)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ESP	electro static precipitator
GMMP	Groundwater Monitoring and Management Plan
Guidelines	*Guidelines for the Preparation of a Public Environmental Report for the Port Pirie Smelter Transformation Proposal (Mid North)*
LC50	lethal concentration, 50% – the concentration of a drug, antibody or toxicant required to kill half the members of a tested population after a specified exposure time
NEPM	National Environment Protection Measure
MNES	matters of national environmental significance, as defined under the *Environment Protection and Biodiversity Act 1999* (Commonwealth)
NHMRC	National Health and Medical Research Council
NOEC	no observed effects concentration
NPI	National Pollutant Inventory
OEMP	Operational Environmental Management Plan
PAH	polycyclic aromatic hydrocarbons
PER	Public Environmental Report
PM_{10}	particulate matter ≤10 µm in diameter
PPRC	Port Pirie Regional Council
SA	South Australia
SEB	significant environmental benefit
TEOM	tapered element oscillating microbalance

TLAP	Targeted Lead Abatement Program — a program established by Nyrstar to re-scope community blood lead reduction initiatives and consider additional measures to improve results.
TSD	Transport Services Division
TSP	total suspended particles
µg/dL	micrograms per decilitre
$\mu g/m^3$	micrograms per cubic metre

1 Introduction

Nyrstar Port Pirie Pty Ltd ("Nyrstar") is proposing to upgrade and redevelop its lead smelting facility at the Nyrstar Port Pirie Smelter, approximately 225 km north of Adelaide, South Australia. Known as the Port Pirie Smelter Transformation (the "Transformation") the primary objective is to facilitate that step change by upgrading the smelter's lead production facilities. The Transformation will replace the out-dated sinter plant with modern enclosed bath smelting technology, install a modern sulphuric acid facility, and update ancillary equipment. The modernised facilities will run more efficiently and will significantly reduce lead and sulphur dioxide emissions.

On 2 August 2013 a Public Environmental Report ("PER") was submitted to the Minister for Planning via the Department for Planning, Transport and Infrastructure ("DPTI") according to the provisions of the *Development Act 1993* ("Development Act") and the requirements of the 2012 Guidelines for the preparation of a Public Environmental Report, Port Pirie Smelter Transformation (Mid North) (the "Guidelines") prepared by the South Australian Development Assessment Commission (DAC).

The PER was placed on public exhibition for a 6-week period between 7 August and 18 September 2013. During this time, the PER and associated advertising was available for viewing electronically via the South Australian Government website. Hard copies of the PER were available for purchase from Nyrstar via DPTI and the Port Pirie Regional Council.

Submissions on the PER were sought through the print and radio media, and through direct contact with members of the public and stakeholders. On 27 August 2013, as part of the formal 6 week public comment period, DPTI facilitated a public meeting in Port Pirie with representatives available from DPTI, Nyrstar and supporting area expert consultants to answer enquiries. In addition, Nyrstar staffed business premises (shop front) in a Port Pirie public shopping centre from 13 to 23 August 2013. During this 10 day period the community or interested parties could view a physical, not-to-scale model of the smelter which showed the proposed changes to the site post commissioning or ask questions or pass comments on the proposed transformation to the Nyrstar representatives who were present. Local media were engaged leading up to and as part of this program to further promote how people could become involved in the consultation process. Specifically this involved placing advertisements promoting the consultation process and the shop front in local television and print media and interviews on ABC Local radio.

1.1 Purpose of the Response Document

This Response Document presents as a formal response to all submissions received by the Minister, and the Nyrstar 'shopfront', during the public consultation period. Submission of this document to the Minister is a component of the development assessment process set out in the Development Act. The Response Document will be released for public information and made available from DPTI and the Port Pirie Regional Council (**Figure 1**).

The Response Document will provide further information relevant to the Guidelines that Nyrstar has produced or acquired since releasing the PER. In addition to the PER, the Response Document will allow the Minister (with assistance from DPTI and other relevant

government agencies) to assess the Transformation and provide a detailed assessment in the Assessment Report. On the advice of the Minster and Cabinet, the Governor of South Australia will then make a final decision on the proposal taking into consideration the PER, the Response Document to public comments and the Minister's Assessment Report.

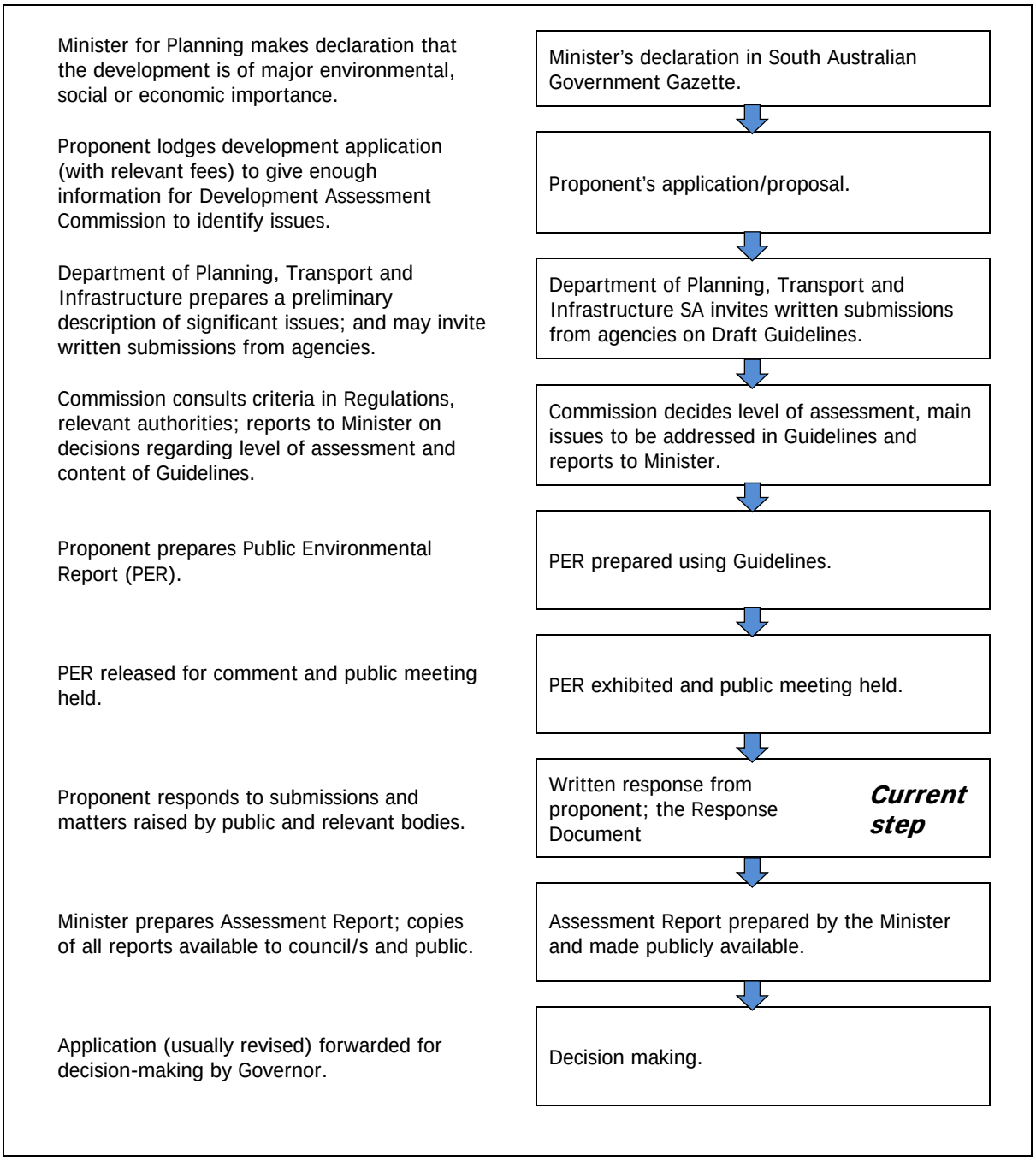


Figure 1: Proposal assessment process and decision making pathways

1.2 Summary of submissions

This Response Document endeavours to clarify matters described in the PER and, in doing so, respond to issues raised in public submissions. A total of 9 written submissions were received by the South Australian Government and provided to Nyrstar for review and response. In addition, 6 responses were received directly from the public via Nyrstar's shopfront.

Table 1 lists the person or organisation that made a submission, provides a summary of the submission issue, shows an assigned identification number, and provides a cross reference to the section in which the submission is addressed. The identification number allocated to the submission is consistent throughout the Response Document. **Appendix A** provides a complete copy of all submissions received.

Responses to the submissions are grouped by area of interest in the following sections:

- Section 2. General comments received
- Section 3. Legislative requirements and approval process
- Section 4. Public participation
- Section 5. Project need, benefits and alternatives
- Section 6. Description of the proposal
- Section 7. Health
- Section 8. Sustainability and climate change
- Section 9. Air quality
- Section 10. Marine
- Section 11. Native Vegetation and fauna
- Section 12. Construction Environmental Management Plan
- Section 13. Soil, surface water and groundwater
- Section 14. Transport
- Section 15. References

Table 1: Cross reference of submissions received

Submission	Name	Issue summary	Section(s) in which response(s) are given
1	Port Pirie Regional Council	Port Pirie Regional Council would like to reiterate its strong continual support for the Nyrstar Transformation Project. Council believes the project will not only transform Nyrstar's business but will also be the catalyst for transforming the economy and the face of the City of Port Pirie. The project, when combined with the Targeted Lead Abatement Program, will achieve the community's objectives of reducing lead in the blood levels of our children. This will significantly assist Council and its partners attract more people, tourists, and business investment to the City. The project will create economic activity and opportunities during construction and provide certainty for others to invest in the City for the long term. For the above reasons, Port Pirie Regional Council strongly supports the Nyrstar Transformation Project.	2.1(1)
2	Doctors for the Environment Australia Inc.	The purpose of this submission is to emphasise that, while the proposed Nyrstar Transformation of the lead smelter at Port Pirie considerably advances the health of Port Pirie residents, the environmental lead exposure of residents still remains of concern to us.	7.1(1)
		Doctors for the Environment submits that the Environment Protection Agency restrictions on lead emissions, as published in National Environment Protection (Ambient Air Quality) Measure (2003), be strengthened, from yearly limits that obscure spikes in emission, to weekly or daily limits. Even so, knowing the variations in lead emissions does not address the issue adequately. Furthermore, it is clear that a clean-up of lead contamination in the environment around the smelter is impractical for reasons of very widespread existing, as well as continuing, pollution. Even without any further lead emission, children are likely to accumulate sufficient existing environmental lead to reach levels of 3 µg/dL.	7.1(2)
		Doctors for the Environment Australia submits; therefore, that communities in lead contaminated suburbs need to be offered an opportunity to re-locate to clean areas. Past practices have brought us to this situation. Denial of its serious nature and procrastination by governments at all levels ought to cease. SA citizens, SA Governments, Local Governments and smelting companies, together, have been the cause of the continuing problem of urban pollution in Port Pirie. The only effective solution is for South Australians as a whole to take responsibility for the mistake, support their fellow citizens in Port Pirie, and pay for the relocation of Port Pirie suburbs away from the smelter or pay for the relocation of the smelter away from the town.	5.1(4), 5.1(6)
3	Epuron	Section 15.4 of the PER notes that “Nyrstar Port Pirie seeks to contribute to South Australia’s climate change mitigation measures by minimising the emissions intensity of its operations”. Epuron applauds this recognition of the impact of climate change. However, we note that the PER does not properly assess alternate energy supply options available to the plant in the form of solar or wind energy options.	8.1(1), 8.1(2)

Submission	Name	Issue summary	Section(s) in which response(s) are given
		Epuron believes that the plant is very well located for both solar and wind energy options to be co-located at the site. Our initial investigations indicate that both the solar and wind energy resources at the site are excellent on a world scale. As a result, based on the strong government support available, Epuron believes that a solar farm or wind farm in the capacity of 10-30MW would be viable at the site and could lead to a lower operating cost for the site in the long term due to the combined benefits of: • Reduced electricity purchase • Reduced electricity network charge • Sale of renewable energy certificates • Potential funding assistance via the Clean Energy Finance Corporation and other government bodies	
		We contend that on this particular site, the economic impact of installing renewable energy options is likely to be positive. Further, this does not have to come at any capital cost to Nyrstar as a number of renewable energy companies would be interested in building, owning and operating the plant under an electricity take off agreement with Nyrstar. The Transformation project provides the ideal opportunity to transform a significant portion of the energy supply system for the smelter at the same time. Accordingly, we consider that such an installation should at least be assessed as part of the PER, or at least a commitment made to carry out a detailed feasibility analysis of both options which would include the installation of wind and solar monitoring equipment to confirm the resource available at the site. Epuron believes Arena grant funding can be sourced to assist with the monitoring of wind and solar resource in the first instance.	8.1(3), 8.1(4), 8.1(5), 8.1(6)
		Nyrstar Port Pirie is in a position to understand the consequences of climate change given its low lying plant and the requirement to include two new levees to protect the plant from flooding by coastal inundation and to ensure contaminated liquors do not enter the Port Pirie River. The PER notes that the South Australian Department of Environment, Water and Natural Resources is prepared to accept the levees as actions to meet the requirements of the Coastal Protection Board's minimum site levels and floor levels for coastal developments to address accelerated sea level rise.	8.2(2)
		The Transformation is well placed to reduce not only its emissions intensity but also its emissions, and in so doing also safeguard the long term cost of its electricity by installing a portion of the additional power it needs from renewable sources – either wind or solar. Renewable energy plant can be installed behind the meter, reducing transmission costs and significantly lowering both the Transformation's emissions and its exposure to power price increase. This reduction in emissions would also benefit both the local community and the South Australian communities around the power generation stations which service the smelter.	8.1(7)

Submission	Name	Issue summary	Section(s) in which response(s) are given
4	SA Health	There has been some confusion over the number of children that have blood levels equal to or exceeding 10 µg/dL. The number of children tested in 2012 and found to have a blood level above 10 µg/dL was reported in the 2012 annual *Technical Paper 2012/4* (including surrogate results) had blood lead levels ≥10 µg/dL (table 1 of report). Without explanation or reference, the PER states on a number of occasions that 200 children remain with blood levels ≥10 µg/dL. The figure of 200 children appears to have been calculated by extrapolating the reported 95th percentile to the *whole population of children* aged 0-4 years using the ABS census estimate of the population size. This is a legitimate use of the statistic but it would have been preferable if the method had been explained as a projection of the number of children ≥10 µg/dL and referenced in the text avoiding confusion by some who have read both the PER and the *Technical Report 2012/4*.	7.1(3)
5	Member for Legislative Council	The first point to note is that it is not easy for members of the public to find out HOW to make a submission and TO WHOM it should be addressed. The relevant information is missing from the official Major Development web site devoted to this project (http://www.sa.gov.au/subject/Housing%2C+property+and+land/Building+and+development/Building+and+development+applications/Major+development+applications+and+assessments/Major+development+proposals/Port+Pirie+Smelter+Transformation) and the DMITRE site as well. The PER document itself does not even include a section on how to make a submission. You could have done better engaging with the community on this.	4.1(1), 4.1(2), 4.1(3), 4.1(4)
		In relation to the Smelter transformation project, I think this is an important project that could help ensure the ongoing viability of the Port Pirie smelter and associated industries. It provides an opportunity to maintain a key industrial asset and considerable local employment in one of South Australia's most important regional centres.	2.1(2)
		The main concern I have is whether the operator is proposing to do enough to reduce ongoing pollution, particularly lead pollution, given its known adverse effects on the health and development of young children. I want the project to succeed, but I think the PER is inadequate in identifying whether this is the best that can be done. In my view, the parents of Port Pirie shouldn't have to choose between having healthy children and having a job. They are entitled to both.	5.1(1)

Submission	Name	Issue summary	Section(s) in which response(s) are given
		The modelling associated with the Smelter Transformation Project anticipates a reduction on ongoing emissions of lead to the surrounding environment of around 50%. However, what is missing from the PER is any detailed analysis of what would be required to reduce ongoing pollution by a greater factor, say 80% or 90%. A key feature of Environmental Impact Assessment is supposed to be an evaluation of "alternatives". This PER does not seriously address this issue. The only "alternative" proposed is to "do nothing". There is no suggestion that an alternative could have been to do even better in relation to lead pollution reduction	5.1(2), 5.1(3),
		There is no serious attempt to evaluate technologies and processes that would deliver better outcomes. The only alternative presented is a "do nothing" alternative. This is poor process and Nyrstar should be required to go back and evaluate options that provide better environmental outcomes. The PER represents an evaluation of what the proponent is prepared to do, not what they should be required to do.	5.2(1)
		Recent published reports showing the level of lead contamination in public playgrounds and in soil samples taken from public parks shows that there is far more that needs to be done to reduce public exposure to lead, even when ongoing lead emissions are reduced as a result of the smelter transformation.	5.1(5)
		When the Governor gives Development Approval to the Smelter Transformation, the proponent's "commitments" should at the very least be reflected in binding conditions of Development Approval. The conditions should set out the detail of the "commitment" to the TLAP including timeframes and the amount of money being put towards this project by Nyrstar and the State Government. Whilst these conditions are not enforceable by the community (by virtue of s.48E), these commitments form a significant part of the overall environmental improvement in Port Pirie and they ought to be formalised in the final approval by way of specific conditions. This means that they will at least be enforceable at the suit of the Minister. In my submission, it would be inadequate to incorporate these TLAP commitments into a vague obligation to undertake the development "in accordance with the PER", as is common in Major Development approvals.	3.2(1)
		According to the PER, the impact of the Transformation will be such that 10-15% of Port Pirie children will still have blood lead levels of more than 10 µg/dL; possibly reducing to 5% of children in the long term. However, if the more stringent US National Toxicology Program standard was to be followed, it is likely that half the children of Port Pirie would still have blood lead levels "of concern", even after the commissioning of the new smelter.	7.1(4)

Submission	Name	Issue summary	Section(s) in which response(s) are given
		I have no doubt that concern about the likely change to lead exposure standards in coming years is the main reason the Government introduced legislation into State Parliament to effectively nobble the EPA and prevent it from exercising full responsibility for pollution licensing. With the passage of this legislation, the EPA is now prevented from changing the lead-in-air concentrations in the licence for 10 years unless the operator or the Manufacturing Minister agrees. This is bad law, which sets a bad precedent for future industrial development in this State. Sadly, it is now a standard feature of negotiations between industrial developers and the Government that demands are made and acceded to that the EPA be sidelined in the name of "regulatory certainty". It happened with OneSteel in Whyalla, BHPB at Olympic Dam and even the ill-fated Penola Pulp Mill. The recent Port Pirie legislation was a vote of No Confidence on the part of the Government and Opposition in the ability of the EPA to do its job properly and according to law.	3.2(2)
6	Environment Protection Authority	In reviewing the modelling data presented in the PER the EPA notes lead was over predicted on western side and under predicted on eastern side of the township whereas blood lead and monitored lead tend to both be higher on the eastern side. Thus the modelling output is not correct on a directional basis due to either source estimation or meteorological effects.	9.1(1)
		At this stage modelling does not cover all those components (for which approval is being sought) listed in the development application and Government Gazette, 28 February 2013. Air quality modelling must consider all parts of the proposal for which development approval is being sought.	3.1(1), 9.1(2)
		Clarification is required of the post transformation production rate of lead for the plant. The PER in figure 15.1 indicates this is 262,000 tpa of lead bullion; but table 7.2 and elsewhere assumes current production rates (under 200,000 tpa). A column should be added to Table 7.2 to show estimated emissions at post transformation production rate.	9.1(11)
		The EPA acknowledges that, due to wetter weather, PM_{10} levels have decreased state wide over the last couple of years and that current levels do not exceed NEPM limits. However, Nyrstar is expected to demonstrate whether the upgrade will increase or decrease PM_{10} levels by modelling with zero background.	9.1(3)
		Given the air NEPM standard for sulphur dioxide is 200ppb as an hourly average and the PER shows that the Oliver Street site is only just outside the modelled 200ppb contour, further justification is required to enable EPA to verify the sulphur dioxide modelled predictions presented in the PER.	9.1(4)
		Further detail around model verification is required to enable the EPA to verify modelling results.	9.1(5)
		Further information is needed to justify not using 24 hour measured lead data to validate the model.	9.1(6)
		The EPA requires clarity on the types of dust monitors used to collect lead in air data used for modelling.	9.1(7)

Submission	Name	Issue summary	Section(s) in which response(s) are given
		Model Set-Up The EPA acknowledges that background is omitted from modelling. This results in higher estimates of dust emissions from the smelter and greater error in the model a. There are a variety of models available and choice often depends on site location, what is being modelled and the number of point sources. The EPA will require an explanation as to why Calpuff was selected and whether it would create different predictions from alternative models such as TAPM. b. The effects from existing buildings was not fully taken into account in the model. The EPA will require an explanation regarding what impact incorporating buildings would have on the model.	9.1(8), 9.1(9), 9.1(10)
		Construction Environment Management Plan (CEMP) The EPA is satisfied with the draft CEMP as presented in Appendix J of the PER for assessment purposes. Preparation of the final CEMP should be conditioned or reserved to ensure any final CEMP is prepared to the satisfaction of the EPA. The final CEMP should consider the following matters (and those also referred to in subsequent sections): The continuous TEOMs at Oliver St and The Terrace and Nyrstar sites will monitor construction and demolition dust. Thought should be given to use this or similar data to inform a dust management plan.	12.1(2)
		Construction Environment Management Plan (CEMP) The final CEMP should consider the following matters (and those also referred to in subsequent sections): Table 3-1 (appendix J) The wording needs to be improved as although contractors, employees, consultants will have responsibility for their work Nyrstar will have overall responsibility	12.1(1)
		Construction Environment Management Plan (CEMP) The final CEMP should consider the following matters (and those also referred to in subsequent sections): Table 5-1 (appendix J) Dust from any demolition and construction is important as it is likely to contain heavy metals – it is not clear how it will be dealt with, any plan must include the ability to take actions and stop work as needed based on feedback.	12.3(1)
		Sulphur dioxide impact assessment Scenario: Acid Plant Trip It is not clear to the EPA's what action Nyrstar would undertake in the event of an acid plant trip to minimise environmental impact. Further clarification is required regarding risk of event and the anticipated sulphur dioxide emissions during plant trips.	6.4(12)

Submission	Name	Issue summary	Section(s) in which response(s) are given
		The ARUP Port Pirie Smelter Upgrade Acoustic Assessment, 25 July 2013 (page 25) states that if/when the noise level reaches a level deemed by the noise policy to have an adverse impact on amenity (greater than 45dBA L_{eq} and/or 60dBA L_{max}) it will not occur on a Sunday or public holiday or between 7pm and 7am on any other day. This requirement needs to be built into the CEMP, including who the responsible body will be.	12.2(1)
		Given the significant issues at the site the EPA requires that the construction environmental management plan (CEMP) be prepared by a person of suitable relevant competency (refer to schedule B9 of the National Environment Protection (Assessment of Site Contamination) Amendment Measure (1999)) and in accordance with relevant site contamination and audit guidelines issued by the EPA. The CEMP must be prepared to the reasonable satisfaction of the EPA and incorporate information regarding the prevention of groundwater contamination. It is appropriate that site contamination auditor engaged for the site review endorse the construction environmental management plan for the site.	12.1(2)
		Appropriate consideration must be given to maintaining the current hydraulic head balance of the surface and groundwater during the construction works, earth movements and the dewatering or recharging of surface water and groundwater. This is to ensure that potential risks to human health and/or the environment are avoided.	13.1(1)
		There are a number of other aspects documented in the PER to be addressed as a part of the review process, these include: - Clearance of seagrass to trench outfall pipe - Entrainment or entrapment of marine biota in the intake structure - Discharge of surfactant as a biocide in the thermal effluent - Dredging of contaminated sediment to install a new caisson at the harbour Until Nyrstar nominate which discharge option is preferred the EPA is unable to undertake a more detailed review and analysis of the proposal. Further work will be required to address data gaps and uncertainty. This is discussed further below.	10.1(1)

Submission	Name	Issue summary	Section(s) in which response(s) are given
		The model outputs have been interrogated and the 10th percentile (worst 10% of the time) suggests that scenario 3 offers the best option for minimising impact on First creek (see summary table below). The EPA acknowledges that current discharge results in a temperature increase of 9^{o}C near discharge point. This scenario is likely to improve the quality of the discharge from Nyrstar in First creek, however there are a number of questions that would need further work if this proposed scenario was the preferred option. These include: - Refinement of the hydrodynamic model including a bathymetric survey of Germein Bay in order to improve the predictive capability of the model including the intertidal areas beyond the mouth of First creek. - Detailed long term collection of water quality data (including temperature, salinity, pH etc.) and meteorological data to validate the model including the intertidal areas. This matter could form a condition or reserved matter on the final approval.	10.2(1)
		An evaluation of whether the discharge of thermal effluent into First creek is likely to impact on the ecology of the environment a moot point given the ~75 years of metal and thermal discharge in the creek. A reduction in the temperature of the effluent by mixing it with the existing discharge in First creek will result in an improvement in the quality of the discharge. If Nyrstar chose to pursue the First creek option they must undertake further work to show: An understanding of the potential for, and magnitude of, erosion, transport and fate of the contaminated sediments from the upper reaches of First creek due to the increased flow of effluent.	10.5(1)
		Figure 3-1 of the BMT WBM report "Port Pirie marine modelling assessment of cooling water discharges to the marine environment" show that 70% of the time the current velocity was less than 0.1 m/sec. The report states that the results with the 12 port diffuser were the better of the two configurations tested. Figure 4-4 shows that the minimum dilution achieved from the 12 port diffuser was marginally above 5.0 when currents were greater than 0.1 m/sec (i.e. 30% of the time). This suggests that while the diffuser could achieve the requirement of no more than 2.0^{o}C above ambient (equal to a dilution factor of 5.0), there is very little margin for error under higher flow conditions. If the discharge to Port Pirie River is the preferred option, further work will be needed to optimise the diffuser design and refine the model to understand the conservatism in the predictions and achieve the best outcome.	10.2(2)

Submission	Name	Issue summary	Section(s) in which response(s) are given
		The proposed scenario of the discharge of thermal effluent into Port Pirie River is likely to achieve the requirement of less than a 2.0^{o}C temperature rise (@ 20m from the diffuser) compared to ambient in the near field. There are still significant uncertainties in the far field model due to the observation of a tidal asymmetry in the river, the way the near field model links to the far field model and considerable assumptions made with the bathymetry. If this scenario is the preferred option, there are a number of aspects that would need further work to reduce the uncertainty. These include: - A bathymetric survey throughout the Port Pirie River and intertidal areas to better resolve the hydrodynamic model and improve the predictive capability of the model and refine the understanding of the tidal asymmetry - Further temporal far field modelling to indicate the dissipation of heat in the upper reaches of the Port Pirie River as a consequence of the reduced flushing, to show the long term temperature rise in the upper reaches as a result of the thermal discharge - Optimisation of the intake and outfall locations in order to avoid short circuiting of the cooling water. It is likely that the location of the outfall should be located as close to the mouth of the river as possible to avoid this.	10.2(1), 10.2(3), 10.2(4)
		The CEMP must ensure Nyrstar and any contractors take all reasonable and practicable measures to avoid impacting on any sensitive biological community whether through the location of the pipe or the methodology of construction (e.g. horizontal directional drilling).	12.4(1)
		The transformation process proposes to use 1.64 m3/sec of marine water as a flow through cooling system. In order to draw this water in an additional caisson is proposed to be located next to the existing caisson structure. The intake flow rate for this structure is proposed to be in the vicinity of 0.6 m/sec. Work undertaken for large seawater intake facilities (Adelaide and BHP desalination plants) suggests that an intake flow rate of less than 0.2 m/sec is likely to reduce the likelihood of entrainment and entrapment of marine biota such as slightly motile larvae. It is therefore required that the intake structure be designed to have an intake velocity of no more than 0.2 m/sec.	10.3(1)

Submission	Name	Issue summary	Section(s) in which response(s) are given
		The installation of a new caisson and the installation of the diffuser pipe (if the Port Pirie River option is taken) are likely to require dredging of the highly contaminated sediments. The volume estimated in the PER is 1550 m^3 of sediment. Given its highly contaminated condition it is likely that there will need to be very stringent conditions on the dredge operator to prevent the generation of plumes of contaminated sediment. The PER proposes that turbidity would temporarily (1-2 weeks) increase up to 1 kilometre from the dredge site, which the EPA considers to be unacceptable. Metals will likely bind to sediment particles and turbidity plumes will therefore also be high in metals which may be toxic to any exposed marine organisms. The dredge operator must adequately control all turbidity generation so that any plume is controlled within adequate control mechanisms which reduce the movement of this pollution. The CEMP for the dredging operator must include pollution control mechanisms that are effective in deep, tidal environments in order to reduce the likelihood of metal contaminated turbidity plumes spreading away from the dredge site. It is recommended that Nyrstar and the dredge operator consult organisations experienced in dredging of highly contaminated sediments to ensure that practices at Port Pirie are undertaken using the best available technology.	12.1(3)
		The PER does not state the fate of dredge spoil. Given its likely highly contaminated condition the EPA requires confirmation of the intention to dispose of the spoil.	12.1(3)
		The PER does not state the fate of dredge spoil. It's important any CEMP ensures that this material is disposed of at an EPA approved location to receive contaminated waste.	12.1(3)
		If the installation of the new caisson and diffuser pipeline (if the Port Pirie river option is taken) includes the need for piling in the marine environment then an underwater noise management plan must be developed to address the potential for impacts on marine mammals and other sensitive receivers.	10.6(1)
		The cooling water is proposed to be dosed with a biocide "Mexel 432" which acts as a surfactant and is stated in the PER to be non-toxic to mammals, bacteria, algae, crustaceans, molluscs and fish. This information is seen to be incorrect as literature suggests that the product is toxic to at least mussels, fish and algae. Therefore the concentration that will be used is paramount to enable a risk assessment of the proposed discharge of this chemical. It is understood that the dose rate will be reliant on construction and operational variables and is unlikely to be known with certainty until the infrastructure has been built. Nyrstar must provide details of the likely dosing of any water treatment chemicals proposed to be used in order for the EPA to undertake an adequate assessment of risk.	10.4(1)

Submission	Name	Issue summary	Section(s) in which response(s) are given
		Climate change adaptation (Section 15.5) The third paragraph requires correction and clarification: "The Inter-governmental Panel on Climate Change (IPCC) has modelled global climate and climate influences and produced scenarios of accelerated sea level rise. Based on this work, South Australia's Coastal Protection Board recommends that a mid-range allowance for sea level rise of 0.3 m by 2050, and a further 0.7 m to 2100, be assumed for South Australia. Additionally, the IPCC has emphasised increased magnitude and frequency of extreme events, such as storm surges, as part of the likely climate change scenarios (Coastal Protection Board 2004)." Note: The latter reference is not included in the list of References on page 224	8.2(4)
7	Department for Environment, Water and Natural Resources	"DEWNR has recommended that, to meet the requirements of the Coastal Protection Board's minimum site levels and floor levels for coastal developments, the site be raised by a further 0.7 m or be practically protected against a further 0.7 m of sea level rise (T. Huppatz, 2013, pers. comm., 14 June 2013). Where raising a site is impractical, such as at Nyrstar Port Pirie, DEWNR may accept an alternative management option. A levee bank is an alternative and acceptable option to protect from sea level rise and wave effects (T. Huppatz, 2013, pers. comm., 14 June 2013)." However that misrepresents DEWNR's position (as per the attached email, dated June 14, 2013), which was that there were three possible options; namely raising site and floor levels as per the CPB recommended levels, accommodating the inundation, or a levee bank. However, the PER only mentions the first and last option, does not indicate the recommended site and floor levels (only the further 0.7m to meet the Board's requirements to 2100) and states that a levee bank is an alternative and acceptable option of addressing the 2100 levels (as opposed to DEWNR's 'could be').	8.2(3)
		"PPRC have constructed a levee bank to protect various areas of the city, including the CBD, from coastal inundation. Nyrstar is currently investigating the best options for extension of the PPRC levee into the smelter's boundaries as part of the Site Levee Bank project. The options under consideration will protect the smelter from inundation, the CBD against floodwaters flowing through the smelter and the possibility of contaminated liquors entering the Port Pirie River as floodwaters ebb. The location of the proposed levee bank is shown in Figure 15-2. Nyrstar will continue to work with the PPRC to address this issue. Climate change adaptation is an ongoing issue that is being addressed by the Site Levee Bank project, separate from the Transformation." This suggests that a levee bank is the chosen protection strategy but the PER does not provide any justification for why it was chosen over the other two options, nor does it demonstrate that the levee bank option is viable or practicable. That needs to be resolved	8.2(1)

Submission	Name	Issue summary	Section(s) in which response(s) are given
		Cooling water dispersion (Section 12.4) The modelling for thermal discharges appears to be minimal and is informed by limited data. The report in Appendix H recommends considerable additional work, including data collection and modelling, and DEWNR concurs that this is necessary. A decision needs to be made as to the chosen option, or at least a preferred option. Three options are presented, discharge to First Creek only, discharge to First Creek and Port Pirie River, or pre-mixing of streams and discharge to the river only. Of these, the second option would seem to compound the damage and so would seem less preferable. However, additional modelling would clarify this. It would also be preferable that the *Zostera* beds were avoided, and erosion would need to be managed. Also, more data is needed on the flushing rates for the Port Pirie River, as there is a probability that warm water would not be exchanged with the more open coast, but be retained in the river which might create larger temperature increases.	10.1(1), 10.2(3), 10.7(1)
		Acid Sulphate Soils The risk and management measures discussed in Sections 11.3.2 and 11.4 of the PER are limited to mention of a future Construction Environment Management Plan (CEMP) and an Operational Environment Management Plan (OEMP). However, the draft CEMP and draft OEMP in Appendix J and K, respectively, do not have sufficient detail on the management of Acid Sulfate Soil. DEWNR should be further consulted regarding this.	13.1(2)
		As per the Coast Protection Board's Strategy for Implementing CPB Policies on Coastal Acid Sulfate Soils in South Australia: The acid sulfate soils component of an Environment Management Plan should specifically include a distribution map and/or cross-sectional diagrams of acid sulfate soil occurrence, potential on- and off-site effects of soil disturbance and groundwater levels, mitigation and treatment strategies for iron sulphide oxidation and surface water and groundwater contamination, monitoring requirements and verification testing, handling and storage of neutralising agents, and containment strategies. DEWNR should be further consulted regarding this.	13.1(3)
		Biosecurity and invasive species Section 12.5.9 mentions obligations regarding ballast water discharges etc. In addition, if new structures are placed underwater, they should be monitored for the first few years to make sure the bare structures do not provide a substrate for opportunistic invasive species	10.8(1)

Submission	Name	Issue summary	Section(s) in which response(s) are given
		Native vegetation clearance/SEB offset Sections 12.5.11 (Seagrass clearance off–sets) and 12.6 (Construction impacts) imply that if there is a loss of seagrass, payment into the Native Vegetation Fund is optional, whereas it is a requirement of Regulation 5(1)(c)(vi) of the Native Vegetation Regulations 2003. Nyrstar's commitment in relation to native vegetation (in the table following the Executive Summary) correctly identifies that a payment would need to be made into the Native Vegetation Fund to achieve a Significant Environmental Benefit (SEB) in compliance with the Native Vegetation Act 1991.	11.1(2)
		Ruppia Figure 12-2 (Coastal and marine communities near Port Pirie based on aerial photography interpretation) needs to be ground-truthed. It would be very unusual to have so much Ruppia on the exposed edge of the mudflats. This needs to be clarified.	11.1(1)
		Table of Contents/Appendices The list of Appendices is not in the location indicated (instead it appears at the end of the PER preceding the various Appendices).	2.2(1)
8	Anonymous	Will this really go ahead? Will there be more metals processed? What is causing the emissions? Will the stack stay? Where is the funding coming from? Are Nyrstar on-board financially?	6.2(4), 6.4(7), 6.4(11), 6.4(10), 6.2(1), 6.2(2)
9	Graham Wood	Are members of the public or ex-employees able to get lead-in-blood tests?	7.1(5)
10	Anonymous	If e-waste is no longer part of the transformation, due to additional contaminants is transformation still viable and likely to lead to Nyrstar turning future profits? What impact will Transformation have on the number of employees at the plant and will the nature of jobs change? What will happen to buildings on-site that will no longer be part of the new process? Will these areas on-site be rehabilitated or just left?	6.3(1), 6.1(1), 6.4(1)
11	Nipper Nitz	Will the power plant building be demolished? Is the blast furnace going to continue operating? Will e-waste be treated? Will the smelter produce different metals?	6.4(2), 6.4(3), 6.3(2), 6.4(6),

Submission	Name	Issue summary	Section(s) in which response(s) are given
12	Anonymous	Will it be going ahead - bit of uncertainty? Will the blast furnace be changed?	6.2(3), 6.4(5)
13	Anonymous	Why not produce your own electricity? What does this mean for the existing blast furnace? Will this increase production? Will production be stopped or reduced during construction? This will be good for the community.	8.1(8), 6.4(4), 6.4(8), 6.4(9), 2.1(3)
14	Phil Kilsby	The responses contained with the Public Environment Report appear to satisfy Metropolitan Fire Service requirements.	2.1(4)
15	Transport Services Division	Traffic Impact Assessment must include the following: - Actual traffic volume data - Time of day of movements - Types of vehicles - Assessment of impact on the rail crossings of increased traffic volumes - Current tonnages exported via road, rail and sea respectively - Expected future tonnages exported by road, rail and sea respectively To expand upon Point 3, the department would appreciate Nyrstar providing detail of any oversize/overmass vehicles anticipated to use the DPTI road network and expected haul routes for these vehicles. A couple of further questions: - Has Nyrstar confirmed a location for the proposed worker's village? - Has Nyrstar commenced or completed a Traffic Impact Study at the present time?	14.1(1), 14.1(2), 14.1(3)

2 General comments received

2.1 Positive comments

Feedback:

1. Port Pirie Regional Council would like to reiterate its strong continual support for the Nyrstar Transformation Project. Council believes the project will not only transform Nyrstar's business but will also be the catalyst for transforming the economy and the face of the City of Port Pirie. The project, when combined with the Targeted Lead Abatement Program, will achieve the community's objectives of reducing lead in the blood levels of our children. This will significantly assist Council and its partners attract more people, tourists, and business investment to the City. The project will create economic activity and opportunities during construction and provide certainty for others to invest in the City for the long term. For the above reasons, Port Pirie Regional Council strongly supports the Nyrstar Transformation Project.
2. In relation to the Smelter transformation project, I think this is an important project that could help ensure the ongoing viability of the Port Pirie smelter and associated industries. It provides an opportunity to maintain a key industrial asset and considerable local employment in one of South Australia's most important regional centres.
3. This will be good for the community
4. The responses contained within the Public Environment Report appear to satisfy MFS requirements

Submission(s): 1, 5, 13, 14

Response:

1. Nyrstar has a long association with the Port Pirie Regional Council (PPRC) and values its partnership with the PPRC who it views as a key strategic stakeholder. In recent years the PPRC has partnered Nyrstar in community lead exposure reduction initiatives and has been a key stakeholder in the tenbyten project the aim of which was to identify and implement initiatives to lower children's blood lead levels. The sustainability of Nyrstar's Port Pirie operation is intrinsically linked to the sustainability of the community, the transformation of the smelter being the platform to deliver both. Nyrstar will continue to work with the PPRC and the community pre and port commissioning to identify ongoing exposure reduction initiatives that directly impact on lowering children's blood lead levels and to ensure that in time both the business and the community have a positive profile with respect to lead.
2. As per response above.
3. As per response above.
4. As per response above.

2.2 PER format

Issue:
1. The list of Appendices is not in the location indicated.
Submission(s): 7

Response:

1. The draft document of the PER contained two occurrences of 'List of appendices'. The first time the 'List of appendices' occurs is on page xxxi which follows the 'List of figures' and precedes the 'Glossary'. The second time the 'List of appendices' occur is on page 234 and 235 which precedes the individual Appendices. The first occurrence of the 'List of appendices' appears to have been omitted during print formatting. Both occurrences of the 'List of appendices' are the same.

3 Legislative requirements and approval process

3.1 Approval sought

Issue:
1. Air quality modelling does not cover all components for which approval is being sought and listed in the development application and Government Gazette.
Submission(s): 6

Response:

1. The Project declaration was published in The South Australian Government Gazette, No 14 on 28 February 2013. It clearly stated, in Schedule 1, that –

   "Development associated with the upgrading and redevelopment of the existing Port Pirie Smelter Operations, including any or all of the following elements:

   a. *upgrading and redevelopment of the current Sintering, Blast Furnace, Acid Making Operations and associated infrastructure and equipment, including construction and operation of:*

      i. *a new Stage 1 Enclosed Bath Smelting Facility (to replace the current Sinter Plant);*

      ii. *a new Stage 1 Oxygen Plant Facility;*

      iii. *a new Stage 2 Enclosed Bath Smelting Facility (to replace the existing Blast Furnace);*

      iv. *a new Sulphur Capture (Acid Plant) System (to replace the existing Acid Plant);*

      v. *the current 'intermediate materials storage area';*

      vi. *storage areas for mineral concentrate and raw materials;*

      vii. *an upgraded sea water intake cooling system; and*

      viii. *associated earthworks.*

   b. *all activities and works associated with the decommissioning or demolition of the existing Sintering Plant, Blast Furnace and Acid Making Operations and associated infrastructure and equipment;*

   c. *the undertaking of works for the purposes of, or otherwise related to, railway lines, roads, parking, stormwater, water supply, power supply, telecommunications and effluent treatment in connection with any development whether undertaken within the site specified in Schedule 2 or on other adjoining or adjacent land;*

   d. *the excavation or filling, or the excavation and filling, of any land, or the formation of land for allotments;*

   e. *any related or ancillary development associated with development within the ambit of preceding paragraphs; and*

   f. *any change in the use of land associated with any development within the ambit of preceding paragraphs.*

   but excluding repairs or maintenance works in connection with the existing plant, facilities or machinery. "

   The Air Quality modelling was for the whole of site, not just the Transformation project area. This was required in order to assess the effects of the proposed project.

3.2 Commitments

Issue:

1. Commitments in the PER should be reflected in binding Development Approval conditions in particular the "commitment" to the TLAP.
2. The legislation preventing the EPA from changing Nyrstar Port Pirie's lead-in-air concentration licence conditions for 10 years unless Nyrstar or the Manufacturing Minister agree is bad.

Submission(s): 5

Response:

1. As the development has been declared a major project and is subject to Section 48 of the *Development Act 1993* (SA), the Governor will determine the conditions after due consideration of the PER, Response Document and Assessment Report. The Governor can delegate this decision-making authority to Development Assessment Commission.

   At completion of the major development assessment process, the Governor may:

   - indicate that he will not grant a development authorisation for the development; or
   - grant a development authorisation, subject to conditions (if any); or
   - refuse approval to the development (see Section 48(2) of the *Development Act 1993* (SA)).

   The Governor may when determining what conditions should be attached to a development approval, attach conditions that must be complied with in the future (see Section 48 (7)(a) of the *Development Act 1993* (SA)).

   A development authorisation, if granted, will usually provide conditions that the development be undertaken in accordance with the PER (among other things).

   The Governor may, by notice in the Gazette, delegate these functions to the Development Assessment Commission

2. Nyrstar understands that not everyone will agree with the scope of the *Port Pirie Smelting Facility (Lead-In-Air Concentrations) Act 2013*. However, to provide certainty of investment and a foundation for the internal approvals required for the Transformation, it is important that for a period of time after the execution of the Transformation, that Nyrstar as the operator of the smelter, has some certainty about the lead-in air conditions imposed on the operation of the smelter. Accordingly, the *Development Act 1993* (SA) will regulate, for a limited period of time, the variation of conditions relating to lead emissions at the Port Pirie Smelter by the Government. The legislation does not contain a prohibition on the EPA changing Nyrstar's lead-in air conditions. In fact, the legislation specifically provides for a variation process. The EPA is able to vary the maximum lead-in-air condition

with the approval of the Manufacturing Minister (or with the consent of Nyrstar). Before granting an approval to vary the maximum lead-in-air condition, the Manufacturing Minister must consult the Environment Minister and consider written submissions, recent medical and scientific advances and international standards. The Manufacturing Minister must also consider the impacts of the proposed change on the Port Pirie community and on Nyrstar's operations, and any other matter the Manufacturing Minister sees fit.

Control also remains with the EPA to set the initial lead-in air limits during the period (up to 6 months) following the Transformation completion date. This is to allow the EPA to consider the operating performance of the project post-commissioning, to ensure the limits are achievable on a sustainable basis.

The legislation will not:

- apply to any other condition of Nyrstar's environmental authorisation other than the maximum lead-in-air condition; and
- affect any requirement for Nyrstar to take reasonable and practicable measures to prevent or minimise any environmental harm that may result from its operations in connection with the plant.

4 Public participation

4.1 Submissions and engagement

Issue:

1. Making a public submission was difficult.
2. Information relevant to making a public submission is missing from the official Major Development and DMITRE web sites.
3. The PER did not include a section on how to make a submission.
4. Inadequate engagement with community during public submission process.

Submission(s): 5

Response:

1. The PER process is managed, structured and coordinated by the South Australian Government. In addition to this, Nyrstar made considerably more effort than what is formally required to engage the community in the PER process. Nyrstar used local media and the Transformation website (http://www.portpirietransformation.com/index.php/news) to assist community consultation and feedback.

   Details of how to make a formal public submission was outlined via a Press Release from the Minister for Planning, the Hon. John Rau, MP.
   A copy of the press release is available on the Major development proposals webpage of the Government of South Australia, and is also linked via the DMITRE

website: (http://www.sa.gov.au/subject/Housing,+property+and+land/Building+and+development/Building+and+development+applications/Major+development+applications+and+assessments/Major+development+proposals/Port+Pirie+Smelter+Transformation) and (http://www.dmitre.sa.gov.au/article/view/1373) respectively.

The advertisement outlines the following of how a submission can be made:

"Written submissions commenting on the PER are invited until 5pm on Wednesday 18 September and should be addressed to:

Minister for Planning
Attention: Robert Kleeman, General Manager, Assessment (Statutory Planning)
Department of Planning, Transport and Infrastructure
GPO Box 1815
ADELAIDE SA 5000

Or sent via email to: dpti.portpiriesmelter@sa.gov.au"

2. As per response above.
3. It is not a requirement of the PER to include a section relating to how to make a submission, however this information was included as part of the community consultation process specifically regarding the notification that appeared in the media regarding the public meeting that was held in Port Pirie on Wednesday 28 August.


Community Consultation at Centro Plaza, Port Pirie

4. As part of the community consultation process there was a requirement for one public meeting in Port Pirie which was held on Wednesday August 28th. This meeting was advertised in local and state based media leading up to the event. Nyrstar as well as Government representatives attended the meeting along with

specialist area experts who were on hand to address any specific environmental or health questions or issues. Additionally, and in parallel with this, Nyrstar held a separate community consultation program which consisted of displays and information in a Port Pirie public shopping centre from 13 to 23 August 2013. During this 10 day period the community or interested parties could view a model of the smelter which showed the proposed changes to the site post commissioning or ask questions or pass comments on the proposed transformation to the Nyrstar representatives who were present. Local media were engaged leading up this program to promote how people could become involved in the consultation process.

5 Project Need, benefits and alternatives

5.1 Air lead

Issue:

1. Concern that Nyrstar Port Pirie is not doing enough to reduce ongoing air lead pollution.
2. PER fails to provide detailed analysis of what would be required to reduce ongoing air lead pollution by a greater factor e.g. 80% or 90%.
3. PER fails to evaluate the alternatives to reducing air lead pollution. The only option presented is a 'do nothing' alternative.
4. Relocation opportunity to "clean areas" needs to be offered to residents in lead contaminated suburbs.
5. More needs to be done to reduce public exposure to lead even after the Transformation.
6. The smelter needs to be relocated away from Port Pirie.

Submission(s): 2, 5

1. Nyrstar has identified the key lead emission sources on site and the Transformation replaces the sintering process with an enclosed bath smelter (EBS) which in turn improves process stability and reduces a number of other air lead sources. As a result of the introduction of this technology it is expected that the air lead emissions will at least halve. The PER goes into considerable detail about these improvements and that this is a major step change for the site's air lead performance. This is also a fundamental metallurgical change that is likely to provide opportunities for further improvements in future years.
2. The PER assessed the relative contribution (to air lead) from the various parts of the site. The approach taken was to achieve the most effective air lead reduction over the shortest possible time frame by eliminating and minimising lead emissions from the site. This approach also allows for the long term strategy of continual improvement. By replacing the sintering (and the associated activities) component of the process, Nyrstar will first eliminate the largest contributor to air lead

emissions. Nyrstar is committed to ongoing continual improvement of smelter emission controls and community programs such as TLAP

3. As per response above.
4. As a result of the in-principle agreement reached to transform the Port Pirie Smelter, Nyrstar and South Australian Government representatives have established a working group to develop objectives and guidelines for the implementation of a Targeted Lead Abatement Program (TLAP) in Port Pirie. The aim of this program is to establish what current and potential future community lead exposure reduction strategies and initiatives will have the greatest impact in reducing children's lead in blood levels. Specifically TLAP endeavours to re-focus community blood lead reduction initiatives and to consider what other measures need to be implemented beyond those currently in existence which have proven to be successful in the past. The ultimate goal is to reduce or minimise the risk of elevated blood lead levels in children in the community. Since the TLAP Working Group's establishment at the beginning of 2013, a number of strategies have been identified, and work is underway to establish which of these strategies will deliver the required positive impact for future ongoing improvements in community lead in blood levels. As previous SA Department of Health (Environmental Health Centre) exposure reduction strategies have included relocating families to "clean areas", this initiative is being reviewed as part of TLAP. Details of TLAP are referred to in Section 8.3.6 of the PER.
5. As per response above.
6. Nyrstar has reached an in-principle funding and support agreement to redevelop the Port Pirie Smelter. The Transformation is subject to feasibility studies which will assess the available technology options against multiple criteria, including the likelihood of delivering an improved environmental footprint and a step change reduction in airborne metal and dust emissions; critical to the ongoing sustainability of the smelter. If an agreement with the State had not been reached, Nyrstar was left with no alternative than to close the smelter. Relocating the operation away from Port Pirie was not considered a viable option for Nyrstar.

5.2 Alternatives

Issue:

1. PER fails to evaluate technologies and processes that would deliver better outcomes.

Submission(s): 5

Response:

1. The EBS technology is currently the best possible technology available to achieve lead emission reductions and provide Nyrstar with an economically viable outcome. This is a substantial undertaking for Nyrstar. Nyrstar is committed to the TLAP to ensure that the efforts that have been made to date, both on and off-site, are not

lost but rather continue to be made into the future in order to achieve a continued long-term air lead reduction.

6 Description of the proposal

6.1 Employment

Issue:
1. What impact will Transformation have on the number of employees at the plant and will the nature of jobs change?
Submission(s): 10

Response:

1. The existing plant will continue to operate as normal and Nyrstar is developing a construction plan that will ensure minimal impact to normal operations during the construction period for the Transformation. Following commissioning of the transformed plant, it is expected that current employment levels at the plant will be sustained.

6.2 Economy

Issue:

1. Where is the funding coming from?
2. Are Nyrstar on board financially?
3. Will it be going ahead - bit of uncertainty?
4. Will the Transformation go ahead?

Submission(s): 8, 12

Response:

1. On 23 May 2013 Nyrstar announced that it had signed an implementation agreement with the Australian Export Finance and Insurance Corporation (EFIC), the export credit agency of the Australian Federal Government, with respect to the EFIC supported tranche of the funding package for the proposed transformation of the Port Pirie smelter into an advanced metals recovery centre (the "Transformation"). The capital investment required for the Transformation is estimated at AUD$350 million[1] and is to be financed by a funding package comprised of:

    - AUD$100 million investment from Nyrstar
    - AUD$100 million capital contribution via a forward sale arrangement of some of the incremental free metal units to be produced at Port Pirie as a consequence of the Transformation
    - AUD$150 million via structured investment to third party investors, benefiting from a guarantee from EFIC.

    The implementation agreement provides a framework and timetable for this component of the funding package. The terms of the agreement remain confidential. Completion is subject to a number of conditions, including final Ministerial approval following completion of the final investment case. The support of EFIC continues to be a critical element in Nyrstar's investment decision and underlines both Nyrstar and EFIC's commitment to the Transformation.

    Nyrstar announced in its First 2013 Interim Management Statement, that on 10 April 2013 it had sold forward to February 2014 (the expected date by which the Transformation funding package would be effected) 5.0 million troy ounces of silver at a price of approximately USD 28/toz. The current intention is that this position would be rolled into AUD$100 million forward sale component of the transformation funding package in February 2014.

    On 24 April, the South Australian Government confirmed its contribution of AUD$5 million towards the funding of Nyrstar's final investment case, expected to be completed by the end of 2013 (with a report due in Q1 2014).

[1] All costs nominal 2012 AUD

2. As per response above.
3. Subject to final feasibility and bankable feasibility reports due to be completed by the end of 2013, a decision on whether the Transformation project proceeds will be made in early 2014 by the Nyrstar board. The decision will depend on a number of conditions being met, including the viability of the business case, and the granting of Development Approval.
4. As per response above.

6.3 E-waste

Issue:

1. Will e-waste be part of the Transformation?
2. Will e-waste be treated?

Submission(s): 10, 11

Response:

1. E-waste will not be treated at the new facility. However, if the opportunity arises in the future separate approval will be sought.
2. As per Response above.

6.4 Operations and demolition

Issue:

1. What will happen to buildings on-site that will no longer be part of the new process? Will these areas on-site be rehabilitated or just left?
2. Will the power plant building be demolished?
3. Is the blast furnace going to continue operating?
4. What does this mean for the existing blast furnace?
5. Will the blast furnace be changed?
6. Will the smelter produce different metals?
7. Will there be more metals processed?
8. Will this increase production?
9. Will production be stopped or reduced during construction?
10. Will the stack stay?
11. What is causing the emissions?
12. Further clarification is required regarding risk of event and the anticipated sulphur dioxide emissions during acid plant trips.

Submission(s): 6, 8, 10, 11, 12, 13

Response:

1. Buildings retained on-site will be assessed according to the final engineering plans developed for the site as part of the Transformation. As stated in Chapter 15 of the PER, the Transformation will involve the permanent decommissioning of a portion of existing site infrastructure. Specifically the Transformation will replace the sinter plant with an EBS oxidation furnace, a heat recovery and electricity cogeneration facility and a modern sulphuric acid production facility. As production continues during the Transformation (subject to a minimal shutdown period), decommissioning of existing processes will not occur until replacement equipment and infrastructure is installed, tested and commissioned. Commissioning of project works will be conducted as each facility is completed and readied for service. Contingency planning will allow for existing facilities to remain operable until commissioned equipment has proven serviceable. Assessment, management and removal of contaminated materials during decommissioning and transition will be managed in accordance with South Australian regulations and will be described in the Construction Environmental Management Plan (see draft set out in Appendix J of PER). Remaining legacy contamination and any rehabilitation will be assessed and managed under the Operations Environmental Management Plan (see draft set out in Appendix K of PER).
2. The power plant building will not be demolished.
3. The blast furnace will continue to operate pre and post commissioning of the Transformation.
4. As per response above.
5. The level of draughting or fume capture will improve.
6. The smelter will not produce different metals however the proportion of metals currently produced will change. Any new metals will be produced under any necessary separate approvals and in accordance with any applicable laws.
7. As a business Nyrstar will always consider the opportunity to process more metals where it is economically and technically feasible to do so and in accordance with any applicable laws.
8. Lead production currently varies depending on the quantity and quality of material processed. The Transformation itself is not expected to increase lead production any higher than historic levels.
9. Production will continue during the construction phase however it is possible that some production impacts may be experienced. Transformation activity areas will be identified and segregated from operations areas to enable construction activities to occur without risk to operations personnel, and without causing any significant production impact to usual operations. Access to Transformation activity areas and operations areas will be strictly controlled, with only authorised personnel allowed in such areas. Authorised personnel will receive all necessary health and safety inductions.

10. The main stack will remain on-site and continue to operate as usual.
11. The cause of the emissions is described in Section 2.3 Project need of the PER.
12. In the event of an Acid Plant trip the following actions and results occur:

    a. **Action:** Off gas that has been processed via the cooling system (waste heat boiler and evaporative cooling tower) and electro static precipitator (ESP) will be diverted to the tall stack via the bag house filter.

       Result: Off-gas volumes leaving the ESP will rapidly reduce from approximately 93,000 Nm^3/h to approximately 10,000 Nm^3/h as the furnace feed is tripped. The off-gas entering the baghouse system will be diluted with approximately 980,000 Nm^3/h of other baghouse system input off-gases. The temperature of combined off-gas is expected to be around 80 °C.

    b. **Action:** Concentrate and residue feed to the enclosed bath smelter (EBS) will be tripped as a result of the acid plant trip.

       Result: Any remaining feed material in the furnace will be smelted within a few minutes, and the SO_2 levels in furnace off-gas will rapidly drop within approximately 5 minutes. The SO_2 level in the furnace off-gas will further reduce over approximately 30 minutes.

    c. **Action:** The furnace lance will be automatically lifted out of the bath when the furnace comes off feed. Lance air flows will be reduced and the pulverised coal rate adjusted (lowered) to maintain furnace temperatures.

       Result: Pulverised coal will be used to maintain furnace temperatures until the duration of the acid plant shut down is confirmed. If the shutdown is short (less than a couple of hours) the lance will remain in the furnace using pulverised coal to maintain temperature, before coming back on feed.

    d. **Action:** If the acid plant shutdown duration is anticipated to be longer than a few hours, the furnace lance will be removed and the standby natural gas burner fitted to the furnace to maintain furnace temperature.

       Result: The standby natural gas burner will be used to maintain furnace temperature and prepare for the furnace to come back on feed. Prior to coming on feed the standby gas burner will be removed and the lance fitted to the furnace.

7 Health

7.1 Lead levels

Issue:

1. The environmental lead exposure of residents remains a concern.
2. Children are likely to accumulate sufficient existing environmental lead to reach levels of 3 µg/dL.
3. There has been some confusion over the number of children that have blood levels equal to or exceeding 10 µg/dL depending on whether the PER or the 2012 annual Technical Paper 2012/4 is referenced.
4. If the more stringent US National Toxicology Program standard was to be followed, it is likely that half the children of Port Pirie would still have blood lead levels "of concern", even after the commissioning of the new smelter.
5. Are members of the public or ex-employees able to get lead-in-blood tests?

Submission(s): 2, 4, 5, 9

Response:

1. Nyrstar is committed to improving the health of Port Pirie residents, particularly young children 0-4 years of age. To this end, Nyrstar has undertaken numerous lead exposure reduction and community-based health programs over a number of years, is committed to the ongoing development of the TLAP and now seeks approval to

upgrade the smelter to deliver a step-change reduction in air lead and sulphur dioxide emissions.

2. There will be some children with higher blood leads in Port Pirie. The ongoing historical deposition means there will be a subset of the population with higher values. If the distributional limit proposed in the National Toxicology Program is adopted the numbers in this group – that is lying outside the normal population distribution – will also be higher. The critical factor is that an integrated program for the management of these children be adopted to minimise the impact of exposure independent of the mode of regulation. Nyrstar is committed to the ongoing development and implementation of such programs.
3. These figures are a projection on an estimated mean of 10. There is a likely error in both the figure of 10±2 and in the estimated numbers of children in this age range some of whom will have had ongoing historical exposure 'in utero' from their mothers.
4. The annual figure does hide the peaks and troughs in the air lead measurements. The time average has to be tied to some agreed national figure as in the NEPM. Shorter time averaging could be adopted but could not be shorter than the agreed sampling times. Such shorter time averaging would not impact on the blood lead outcomes which also represent a degree of averaging over shorter time periods. In consequence it is not likely that shorter timing would provide better estimation of the relationship between air lead and blood leads. Alternative regulation could be tied to the number of annual exceedances of an agreed upper bound on air lead concentrations. Reference to Air quality criteria and Australian and international blood lead standards can be found in Section 7.2 and 8.3.6 respectively in the PER.
5. Any member of the public regardless of age or occupation can request a lead in blood test either through their local GP or through the Environmental Health Centre (EHC). If the test is conducted through a GP, the base line result can be discussed confidentially with the EHC who can provide guidance regarding lead in blood reduction or exposure reduction advice. Similarly if the test is conducted through the EHC, a result letter will be sent to the client regardless of the result. If the result is elevated, support can also be provide through one of the centres Family Support Workers who can assist with lead in blood reduction or exposure reduction advice.

8 Sustainability and climate change

8.1 Energy

Issue:

1. PER does not properly address alternate energy supply options.
2. On-site co-location of wind or solar farm is possible.
3. Economic impact of installing renewable energy likely to be positive and there may be no capital cost to Nyrstar.
4. Transformation project an ideal opportunity to reconfigure the smelter's energy

supply system.

5. PER should have addressed directly or made a commitment to carry out feasibility analysis of alternative energy supply options.
6. ARENA grant funding can be sourced to assist monitoring wind and solar resources.
7. Use of renewable energy at the smelter will reduce emissions intensity and overall rate, reduce transmission costs and minimise exposure to power price increases.
8. Why not produce your own electricity?

Submission(s): 3, 13

Response:

1. The project has considered existing available energy options coupled with a proposed cogeneration system to utilise waste heat.
2. The on-site co-location of a wind or solar farm is possible and Nyrstar will consider proposals for the development of renewable energy infrastructure on their merits.
3. A detailed investigation would be required to determine the economic feasibility of renewable energy infrastructure at the smelter.
4. A number of actions have been taken to minimise the energy requirements to the smelter such as the cogeneration system and use of higher voltage supplies.
5. A review of the energy requirements for the facility post-Transformation was undertaken and it was determined that the most economically feasible option was for the development of a cogeneration plant. Other energy sources were considered to be uneconomic. As additional information becomes available these decisions may be reviewed.
6. Nyrstar acknowledges that Australian Renewable Energy Agency (ARENA) grant funding can be sourced to assist monitoring wind and solar resources.
7. Depending on the economic feasibility of renewable energy infrastructure utilised at the smelter, renewable energy could reduce emissions intensity and overall rate, reduce transmission costs and minimise exposure to power price increases.
8. The cogeneration system is meeting in part on-site electrical needs however the sizing of the plant was limited due to economic considerations.

8.2 Flood mitigation

Issue:

1. Justify why a levee bank is the chosen protection strategy against coastal inundation versus allowing water to flow into/through buildings or raising the site.
2. Nyrstar Port Pirie recognises risks of climate change by considering two new levees.
3. Fourth paragraph in Section 15.5 Climate change adaptation, misrepresents DEWNR's position.

4. Third paragraph of Section 15.5 Climate change adaptation, requires correction and clarification.
Submission(s): 3, 6, 7

Response:

1. The levee bank is Nyrstar's chosen protection strategy because it represents the safest and most cost effective strategy to manage the risk of coastal inundation to employees and infrastructure at the smelter. Nyrstar has considered the issue of coastal inundation since late 2009 after an approach by the Port Pirie Regional Council (PPRC) engineers. Nyrstar recommended an investigation into the Scope of Works that fulfilled the PPRC's Levee Bank requirements via the engagement of the Nyrstar WorleyParsons Project Alliance.
2. As per response above.
3. The fourth paragraph in Section 15.5 of the PER states, "A levee bank is an alternative and acceptable option to protect from sea level rise and wave effects."

   Nyrstar acknowledges the following advice was provided by DEWNR:

   "*Sea Flooding*
   The levels that DEWNR recommends for Port Pirie as meeting the Coast Protection Board's minimum site and floor levels for coastal development are as follows:
   - *100 year ARI water level (1% exceedance probability): 2.85m AHD*
   - *Sea level rise allowance to 2050: 0.3m*
   - *Wave effects: 0.2m*
   - *Minimum site elevation to meet the CPB's requirements to 2050: 3.35m AHD*
   - *Minimum floor level (includes freeboard of 0.25m): 3.6m AHD*

   To meet the Board's requirements to 2100, development should either be raised by a further 0.7m or be able to be practically protected against a further 0.7m of sea level rise.

   In circumstances for which raising sites is impractical for operational reasons, developers should ensure that the development could accommodate water reaching the relevant site elevation recommendation (2050 or 2100). This might, for example, allow water to flow into/through buildings, but all vulnerable equipment (mechanical, electrical, etc) is elevated to the recommended floor level.

   A levee bank could be an alternative and acceptable means of addressing the 2100 levels (rather than the raising of sites or the accommodation option discussed above) provided that the sites remain above current Mean Sea Level plus 1 metre (that addresses the projected 2100 Mean Sea Level)."
4. Nyrstar recognises that Section 15.5, third paragraph should read the following: "The Inter-governmental Panel on Climate Change (IPCC) has modelled global climate and climate influences and produced scenarios of accelerated sea level rise. Based on

this work, South Australia's Coastal Protection Board recommends that an allowance for sea level rise of 0.3 m by 2050, and a further 0.7 m to 2100, be assumed for South Australia. Additionally, the IPCC has emphasised increased magnitude and frequency of extreme events, such as storm surges, as part of the likely climate change scenarios (Coast Protection Board 2004)."

The following reference is included below to reflect the omission. Coast Protection Board (2004), Coast Protection Board Policy Document (Endorsed 30 August 2002): http://www.environment.sa.gov.au/files/25111204-b9a7-4954-9f62-9e3900ec43d8/cpb_policy_document_2002.pdf

9 Air quality

9.1 Modelling

Issue:

1. Directional air lead modelling predictions are incorrect due to either source estimation or meteorological effects
2. Air quality modelling fails to cover all parts of the proposal for which development approval is sought
3. Demonstrate whether the Transformation will increase or decrease PM_{10} levels by modelling with zero background
4. Justify the relationship between observed and modelled sulphur dioxide results at Oliver Street site
5. Further detail around model verification is required to enable the EPA to verify modelling results
6. Not using 24 hour measured lead data to validate the model was questioned.
7. Clarify the types of dust monitors used to collect lead in air data.
8. Higher dust emission estimates from the smelter and greater model error is questioned due to omission of background in modelling.
9. Justify the selection of Calpuff versus alternative models e.g. TAPM, and concomitant variations in model outputs.
10. Existing building effects were not fully considered in air quality modelling.
11. Modify table 7.2 to show estimated emissions at post transformation production rate.

Submission(s): 6

Response:

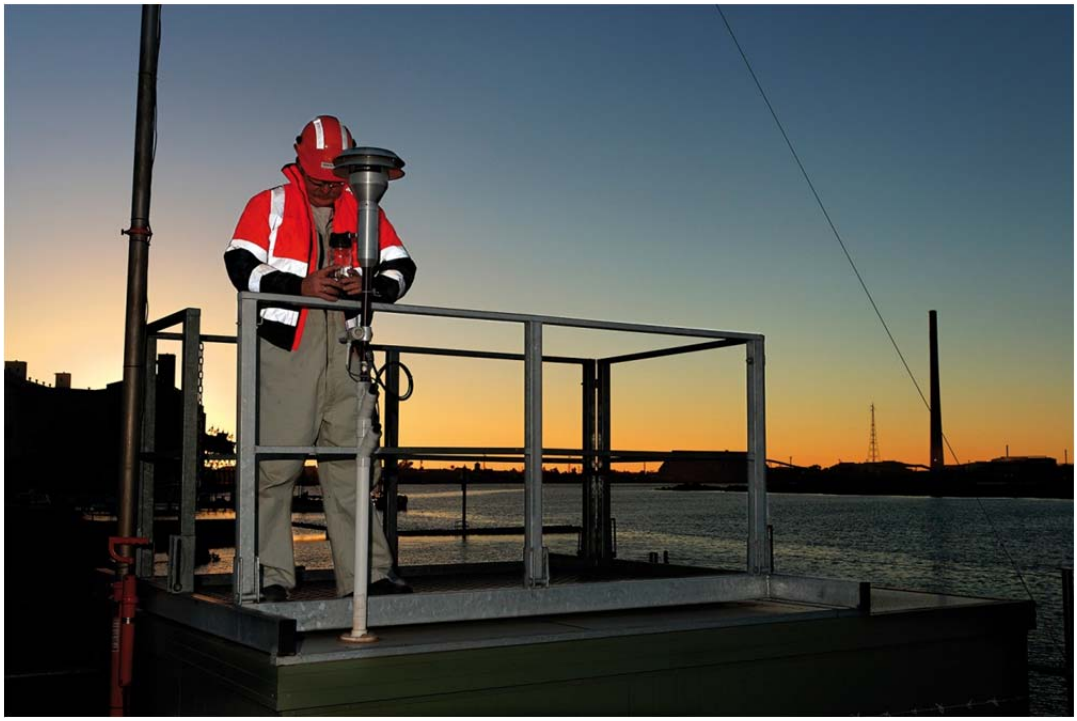
1. The bias in the air lead modelling results is most likely to be due to bias in the wind direction data. This hypothesis is supported by the reasonably close agreement (apart from some directional bias) between the shape of the air lead contours in

Figure 7-3 (based on observations) and those in Figure 7-10 (modelled contours using current emissions).

The limitations of the available wind data are discussed in the PER, section 3.1 of Appendix B: Air lead impact assessment. For the low-level lead sources, the near-surface winds are more important than the upper levels winds which dominate dispersion of the SO_2 plumes. Low-level winds are much more strongly affected by local variations in vegetation, topography and the land/water interface, and so vary spatially across the town.

Adjustments could be made to the wind data used in the modelling in order to improve agreement with the observations, but these would be arbitrary and would not improve confidence in the modelling results.

The approach taken in the air lead modelling to address the limitations of the wind data was to predict post-transformation air lead concentrations by computing the modelled reductions at each site (pre- to post-Transformation) and multiplying the existing observed annual averages by this ratio. The veracity of this approach is supported by the fact that the predicted change in concentrations is close to 50% (47% - 53%) at all sites except The Terrace. That is, the modelling shows similar percentage reductions across most of the town, so that the bias in the wind direction data has little effect on the predictions presented in the report.



2. As per response 3.1(1).
3. At a given location and time in Port Pirie, the observed PM_{10} concentration, C_{total}, can be written as the sum of C_{back}, the background concentration that would be observed if the smelter made no contribution, and $C_{smetler}$, the contribution from sources within the smelter:

   $C_{total} = C_{back} + C_{smelter}$

In general, it is not possible to determine C_{back} from measurements because of the presence of smelter contributions. Modelling of $C_{smelter}$ was not carried out for the PER because PM_{10} emissions will be reduced by the Transformation and so $C_{smelter}$ will also be reduced. As discussed elsewhere, these PM_{10} reductions will occur because this is how some of the reductions in lead emissions will be achieved. For example, particulate emissions from unpaved roads and pit areas are estimated to be just 12.8% lead. Thus a reduction of 1,000 kg/year in lead emissions from these sources is associated with a reduction of about 7,500 kg/year in PM emissions. Some other sources of PM contain a higher proportion of lead, e.g. 32% for the sinter plant fugitive emissions, but in all cases there are reductions in PM emissions. Thus, although modelling could be used to quantify the reductions, given that there are no new sources or increased PM_{10} emissions, a mass balance argument demonstrates that $C_{smelter}$ will be smaller post-Transformation.

4. Table 6-2 of Appendix C: Sulphur dioxide impact assessment in the PER, shows the excellent agreement between the predicted and observed concentrations at Oliver Street and three other monitoring sites for 2005/2006 – this year was chosen for the modelling because of the greater availability of data for validating the model.

   The PER shows the dramatic reduction in the number of days post-Transformation with exceedances of the 1-hour NEPM standard for SO_2. It is predicted that it is most likely that there will be no exceedances at Oliver Street but it is acknowledged that based on the proximity of the contour line for 2 exceedances per year to Oliver Street (Figure 7-13 of the PER), there could be occasional exceedances. However, it is also noted that emission estimates used in the modelling are conservative.

5. As per Response 4 and 9.

6. The focus of the lead modelling was on annual average lead concentrations. Much of the variation in observed 24-hour lead concentrations is due to day-to-day variations in the fugitive emissions and specific meteorological conditions on a particular day. The annual statistics of these variations are captured in the model but not the particular day-to-day variations. Thus the standard evaluation methodology was used of quantile to quantile comparisons of observations versus predictions unpaired in time.

7. The dust monitors used by Nyrstar are High-volume Air (TSP) samplers.

8. As per Response 3 above.

9. Section 4.1 of the Appendix B: Air lead impact assessment in the PER provides the justification for the use of CALPUFF. In brief, it is a much more capable model than TAPM in coping with a large number of low level sources with emission characteristics dependent on the wind speed. The modelling of current conditions was used to validate its performance. While there are some differences from current observed air lead concentrations, the overall pattern is in reasonable agreement, albeit with an apparent bias in the wind direction data – this is discussed elsewhere.

   In contrast, TAPM has been shown to perform well for elevated stack sources, which are the main sources of SO_2, thus this model is considered more appropriate for this

modelling. The veracity of the SO_2 modelling for the Port Pirie smelter emissions was demonstrated by the good agreement between 2005/6 observed ground-level SO_2 concentrations and model results for that period.

10. The inclusion of buildings in the modelling is not justified because the source characteristics of the fugitive sources are not sufficiently well defined. It is considered that adding buildings would add to model uncertainty rather than improving confidence in the results. As described in the modelling report, the assumptions used are generally conservative, so that it is considered that the modelling results are generally conservative.

11. The air lead modelling by Air Assessment as presented in Appendix B: Air lead impact assessment of the PER and the numbers in Table 7-2 are based on average 2010-2011 lead emission rates, which were based on an average lead bullion production from the Blast Furnace for 2010-2011 of 207 ktpa (the average of 196.5 ktpa in 2010 and 217.8 ktpa in 2011).

    Post-Transformation, the plant has a potential to produce 262 ktpa lead bullion. This is 21% higher than the average used in the modelling.

    The impact of this on the individual source emissions in Table 7-2 has not been assessed but a conservative (and simple) method is to assume that all the numbers in the second last column of Table 7-2 be increased by 21%.

    Using this conservative assumption, the predicted annual average air lead concentrations in the fourth column of Table 7-3 would also be increased by 21%, as shown by the fifth column added in the table below. The reasoning behind this is as follows. The values in the fourth column were calculated as

    $C_{Trans} = (M_{Trans}/_{Mcurrent}) \times C_{obs}$

where C_{obs} is the value in the second column and ($M_{Trans}/M_{current}$) is ratio in the third column of the modelled concentrations. The conservative assumption of a 21% increase in all emissions would increase M_{Trans} by 21% to 1.21 x M_{Trans}, and so increase the C_{Trans} to 1.21 x C_{Trans}.

Table 7-3 (Updated): Summary of current and predicted post-Transformation annual average air lead concentrations (µg/m^3) at the monitoring sites

Monitoring site	Observed annual average air lead concentrations 2010-2011 (µg/m^3)	Predicted post-Transformation as % of current values (%)	Predicted post-Transformation annual average air lead concentrations (µg/m^3)	Predicted post-Transformation annual average air lead concentrations (µg/m^3) at maximum production rate of 262 ktpa
York Road	0.19	52	0.10	0.12
Senate Sports Park	0.21	53	0.11	0.13
Frank Green Park	0.15	53	0.08	0.10
Terrace	1.00	39	0.39	0.47
Dental Clinic	3.33	49	1.64	1.97
Ellen Street	2.22	48	1.08	1.29
Port Pirie PS	0.39	51	0.19	0.24
Baseball Club	0.21	51	0.10	0.13
Boat Ramp	0.60	47	0.28	0.34
Solomontown	0.40	47	0.19	0.23
St Marks College	0.11	52	0.06	0.07
Oliver Street	0.27	49	0.13	0.16
Median	0.33	50	0.16	0.20

10 Marine

10.1 Cooling water discharge options

Issue:

1. A decision is needed regarding the preferred discharge option. It is noted that of the three discharge options (discharge to First Creek, discharge to First Creek and Port Pirie River, and pre-mixing of streams and discharge to the river only) discharge to First Creek and Port Pirie River is less preferable as it would compound the problem.

Submission(s): 6, 7

Response:

1. Nyrstar has decided to pursue the Port Pirie River discharge option rather than the First Creek option.

   In the submission there is some misunderstanding regarding the discharge options investigated in the PER. The preferred discharge option is to continue with the existing cooling water discharge to First Creek, and discharge the additional cooling water required for the transformation to Port Pirie River. Thus, the status quo in the holding pond behind the 1M flume and in First Creek would be maintained rather than compounded.

   Pre-mixing the existing and new cooling water streams and discharging to the Port Pirie River only was not investigated as an option in the PER as it was considered that it would result in the movement of contaminated water into the Port Pirie River (see Chapter 11 of the PER).

10.2 Cooling water modelling

Issue:

1. Considerable additional data collection is necessary to validate model results. In order to validate model predictions for the First Creek option (scenario 3) a bathymetric survey of Germein Bay, and detailed long term collection of water quality and meteorological data are required (potentially as a condition of approval). In order to improve the predictive capability of the model and refine the understanding of the tidal asymmetry for the Port Pirie River option a bathymetric survey of the Port Pirie River (and intertidal areas) is required.
2. Further work is needed to optimise the diffuser design to provide a better understanding of the conservatism in the model predictions.
3. The flushing rate for the Port Pirie River may be limited. Further temporal far field modelling is therefore required to demonstrate that heat will not accumulate in the upper reaches of the Port Pirie River.
4. Optimisation of the intake and outfall locations is required to avoid short circuiting of the cooling water.

Submission(s): 6, 7

Response:

1. Since the First Creek option will not be adopted, the bathymetric survey of Germein Bay will not be required.

   Nyrstar will work with the EPA and DEWNR to determine the requirements for additional model validation for the Port Pirie River option. The additional data acquisition may include a bathymetric survey of the Port Pirie River and the collection of additional water quality and meteorological data.

Prior to undertaking the collection of additional data, Nyrstar proposes to undertake a sensitivity analysis to determine the relative importance of heat exchange with the atmosphere and water exchange with the gulf as the main mechanisms of heat removal from the estuary. If heat exchange with the atmosphere proves to be the main mechanism of heat removal, a bathymetric survey and collection of additional oceanographic data to validate model performance in predicting water movement may be less important than the collection of additional meteorological data to validate interactions with the atmosphere.

An initial sensitivity analysis may be undertaken by determining the effect on model outcomes of artificially constraining water exchange with the gulf. If model outcomes remain acceptable, it would demonstrate that heat exchange with the atmosphere is the main mechanism of heat removal from the estuary.

2. A design sensitivity study has been undertaken by BMT WBM to determine the most effective means of optimising the performance of the diffuser in diluting and dispersing the cooling water in the near field (i.e. within about 100 m of the diffuser) (see **Appendix B**).

   The concept designs give a variety of diffuser configurations to demonstrate that appropriate near field temperature and dilution targets can be achieved. The sensitivity analysis of alternative conceptual diffuser designs compares the effect of changing the various diffuser design parameters such as port size, number of ports, exit velocity etc.

   Nyrstar will ultimately be responsible for designing a diffuser capable of achieving near field dilution targets set by the EPA.

   A basic principle of diffuser design is to maximise initial dilution by discharging the cooling water under pressure from numerous ports into the water column where it will rapidly entrain and mix with ambient water. Being buoyant, the cooling water plume will rise to the surface where secondary dispersion and dilution will occur via currents and waves.

   The sensitivity of dilution rates to changes in diffuser design parameters was assessed using empirical equations derived from laboratory model tests. The equations of the CORMIX modelling package were used during the analysis. CORMIX is widely used in the United States by the Environmental Protection Agency and is capable of modelling multi-port diffusers over a range of ambient current speeds.

   The sensitivity analysis showed that the rate of dilution of the cooling water was highly dependent on a number of interrelated factors, including exit velocity of the discharge, the port diameter, and the number and spacing of ports (**Table 2** and **Table 3**).

   It was assumed that the water depth at the diffuser was 6.4 m. With the relatively limited water depth, it was considered that the best discharge angle to maximise dilution and minimise impingement with the surface was horizontal discharge from the diffuser. Ultimately, the discharge angle is likely to be at least 15-20 degrees from the horizontal to minimize the risk that the discharge will erode and mobilise

bottom sediments. The most appropriate discharge angle will be determined during the detailed design stage.

The most relevant results from the sensitivity analysis are as follows:

- In all cases higher exit velocities provide the best outcomes.
- Fewer ports with higher exit velocities provide better outcomes (compared with more ports with lower exit velocities).
- The higher exit velocities may be unrealistic as they may be unattainable and may cause cavitation in the diffuser.
- Note that the shorter diffusers appear to give better outcomes than the longer diffusers, which is an artefact of CORMIX and should not be relied upon.

Of the 81 design combinations examined, all except one provide temperature outcomes that are compliant with the existing guideline (< 2^{o}C above ambient 20 m from the diffuser).

Compliance with the proposed guideline was also tested i.e. the 50th percentile of the temperature of the plume at 20 m from the diffuser is less than the 80th percentile of the ambient temperature. Using the 25 m diffuser with six 0.12 m ports and high exit velocity the diffuser was found to be compliant using both the monthly and weekly comparisons (**Figure 2**). However, it is noted that there is difficulty in maintaining compliance during spring tides when there is relatively little variation in temperature (see **Appendix B**).

More refined modelling of the diffuser designs will be made during the detailed design phase.

Table 2: Diffuser sensitivity showing dilutions 20 m from diffuser

Ambient Velocity (m/s)	Port Diameter (m)	No. of Ports	Exit Velocity (m/s)	0.03 (20th %-ile)			0.06 (50th %-ile)			0.14(80th %-ile)		
Diffuser Length (m)				25	50	75	25	50	75	25	50	75
	0.12	6	24.2	35.0	35.7	29.8	34.0	34.0	27.8	29.7	11.2	10.2
		8	18.1	30.2	30.8	25.7	29.1	28.9	23.4	9.9	10.2	9.2
		10	14.5	26.9	27.4	22.8	25.8	25.3	20.4	9.3	9.3	8.3
	0.16	6	13.6	26.1	26.5	22.0	24.9	24.4	19.6	9.2	9.1	8.0
		8	10.2	22.4	22.7	18.8	21.1	20.4	17.7	8.3	7.9	7.4
		10	8.2	19.9	20.1	16.6	18.5	17.7	5.6	7.5	7.1	6.9
	0.20	6	8.7	20.6	20.8	17.2	19.3	18.5	5.7	7.8	7.3	7.1
		8	6.5	17.7	17.8	14.7	16.2	5.6	5.3	6.7	6.7	6.4
		10	5.2	15.7	15.7	12.9	14.1	5.3	5.0	5.9	6.2	5.9

Table 3: Diffuser sensitivity analysis showing temperature increase above ambient 20 m from the diffuser

Ambient Velocity (m/s) / Diffuser Length (m)	Port Diameter (m)	No. of Ports	0.03 (20th %-ile)			0.06 (50th %-ile)			0.14 (80th %-ile)		
			25	50	75	25	50	75	25	50	75
	0.12	6	+0.29	+0.28	+0.34	+0.29	+0.29	+0.36	+0.34	+0.89	+0.98
		8	+0.33	+0.32	+0.39	+0.34	+0.35	+0.43	+1.01	+0.98	+1.09
		10	+0.37	+0.36	+0.44	+0.39	+0.40	+0.49	+1.08	+1.08	+1.20
	0.16	6	+0.38	+0.38	+0.45	+0.40	+0.41	+0.51	+1.09	+1.10	+1.25
		8	+0.45	+0.44	+0.53	+0.47	+0.49	+0.56	+1.20	+1.27	+1.35
		10	+0.50	+0.50	+0.60	+0.54	+0.56	+1.79	+1.33	+1.41	+1.45
	0.20	6	+0.49	+0.48	+0.58	+0.52	+0.54	+1.75	+1.28	+1.37	+1.41
		8	+0.56	+0.56	+0.68	+0.62	+1.79	+1.89	+1.49	+1.49	+1.56
		10	+0.64	+0.64	+0.78	+0.71	+1.89	+2.00	+1.69	+1.61	+1.69

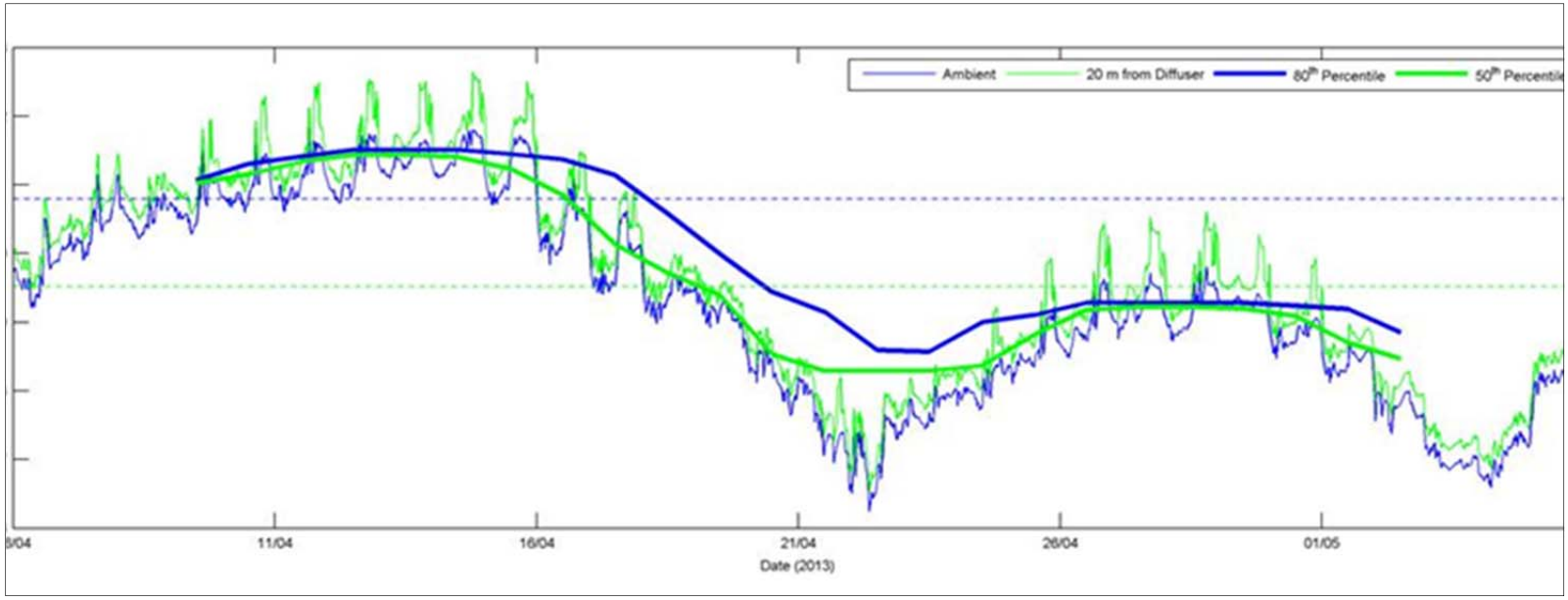


Figure 2: Comparison with the proposed Water Quality Policy based on a 25 m diffuser with six 0.12 m ports and high exit velocity. Dotted lines show the monthly comparison and the bold lines the weekly comparisons

3. Additional far field modelling was undertaken to demonstrate that heat will not accumulate in the Port Pirie River, particularly in its upper reaches (see **Appendix B**)

   Whilst there is potential for chemical pollutants such as metals to accumulate in the estuary, physical pollutants such as heat do not rely on flushing alone to be removed from the estuary. Heat loss to the atmosphere is also likely to be a significant removal mechanism.

   With its relatively large surface area and shallow depth, the ambient water temperature in Port Pirie River appears to respond relatively rapidly to atmospheric temperatures. For example, the ambient water temperature in the Port Pirie River has been shown to vary by up to 1 degree C daily (**Figure 2**). The temperature peaks appear to be related to both diurnal and tidal cycles.

   The approach taken by BMT WBM was to demonstrate that accumulation of heat in the estuary reaches equilibrium relatively quickly i.e. within weeks, and no further heat accumulation occurs. A one month model run (June 2013) and a three month model (June to August 2013) was undertaken. The resulting temperature contours for each model run were presented as 0th, 10th and 50th percentile exceedances and compared. The process was repeated in mid-summer (see **Appendix B**).

   The results for the 0th percentile exceedances for winter are presented in **Figure 3** and **Figure 4**. The results indicate that the temperature increases throughout the estuary are very similar for the one month and the three month model runs, indicating that no further heat accumulation was occurring in the estuary after the first month of the model run. Similar results were found for the summer model runs (**Appendix B**).

4. The issue short circuiting of cooling water is an important operational issue. The proposed intake and outfall locations are currently about 300 m apart. The intake will be placed near the floor of the estuary to provide vertical separation between the cooling water plume that will rise to the surface upon discharge and the cooler water near the floor of the estuary.

   Preliminary modelling indicates that some degree of short circuiting is likely to occur, with the intake water temperature being from 0.3 to 1.5 ^{o}C warmer than the ambient water temperature (see **Figure 5** and **Appendix B**).

   At the detailed design phase further modelling will be undertaken in consultation with the EPA to examine the implications of the short circuiting and, if necessary, model alternative intake and outfall locations.

10.3 Cooling water intake velocity

Issue:

1. Based on the precedents set by other recent projects in South Australia, it is required that the intake structure be designed to have an intake velocity of no more than 0.2 m/sec to minimise the potential for impingement and entrainment.

Submission(s): 6

Response:

1. A review of studies assessing power station intakes in NSW suggested that impingement or entrainment would be minimised with an intake velocity of <0.6 m/s (The Ecology Lab 2005).

   In view of the 0.6 m/s intake velocity recommended in NSW, the required intake velocity of 0.2 m/s is considered to be conservative. Nevertheless, during the design of the intake caisson, the requirement for an intake velocity of < 0.2 m/s will be taken into consideration. If feasible, the requirement will be complied with. If it does not prove to be feasible, Nyrstar will undertake to ensure that the intake velocity does not exceed 0.6 m/s.

   The EPA will be consulted during the detailed design phase to ensure that a mutually acceptable intake is installed.

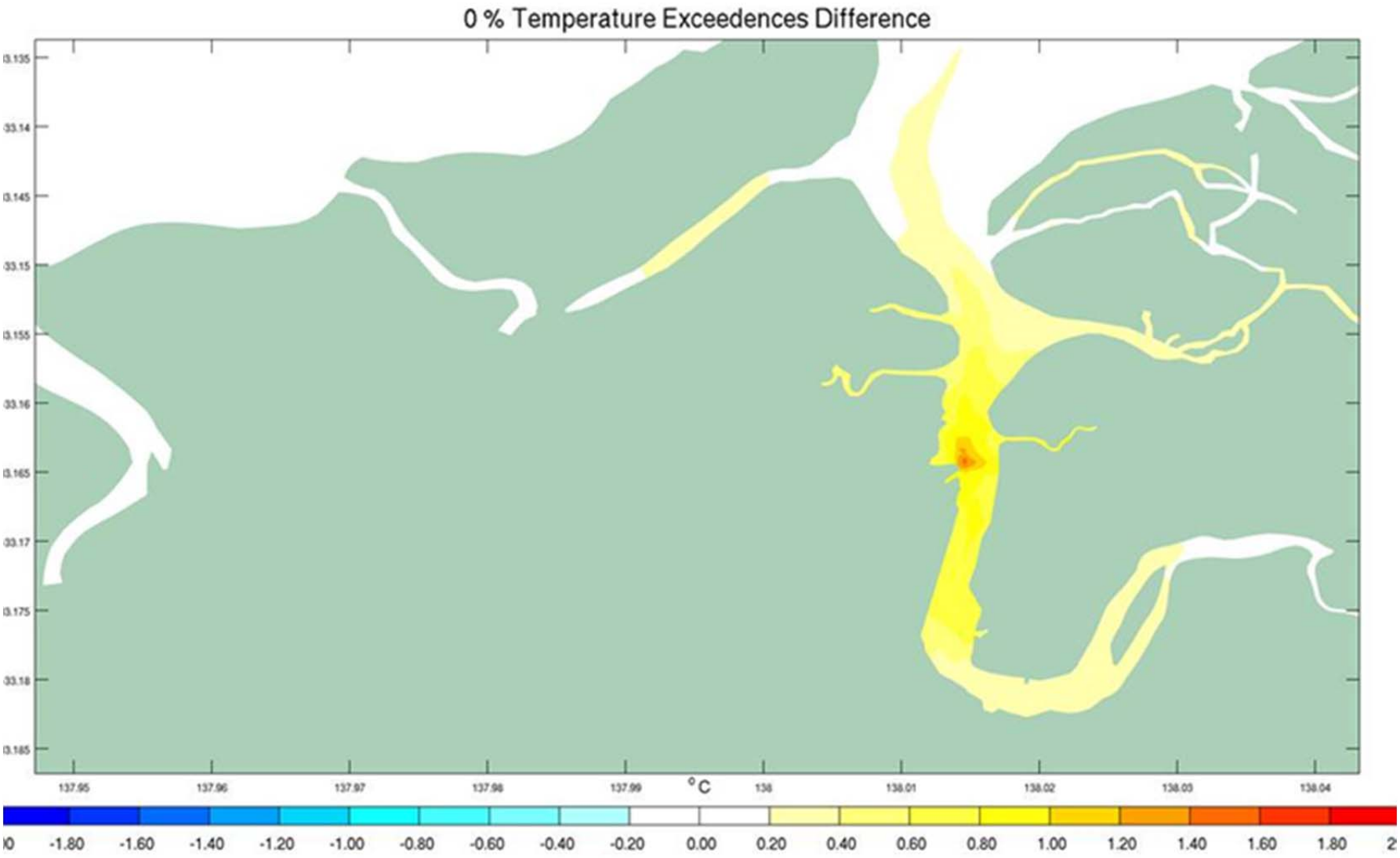


Figure 3: Worst case (0th percentile) temperature increases for the one month (June) model run

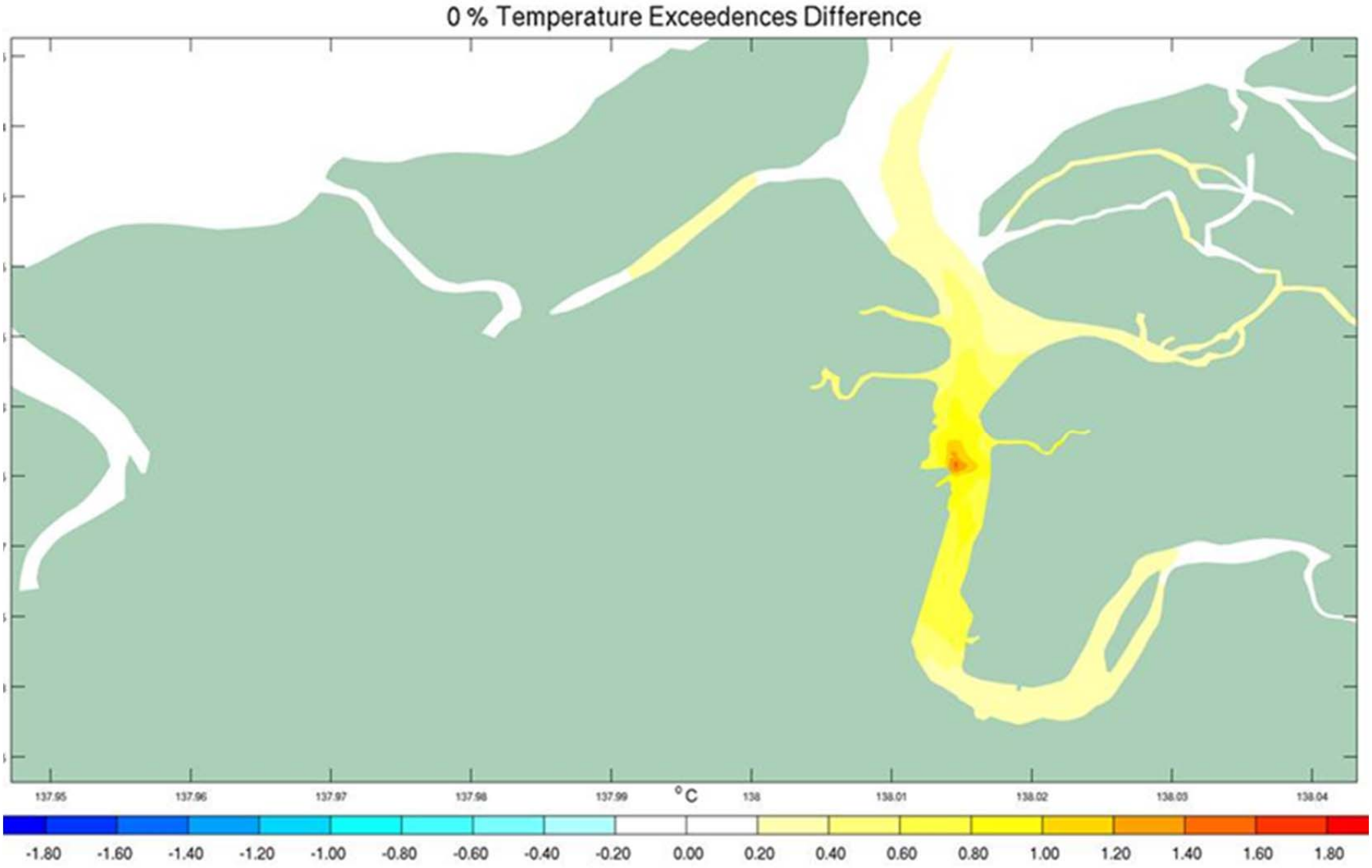


Figure 4: Worst case (0th percentile) temperature increases for the three month (June to August) model run

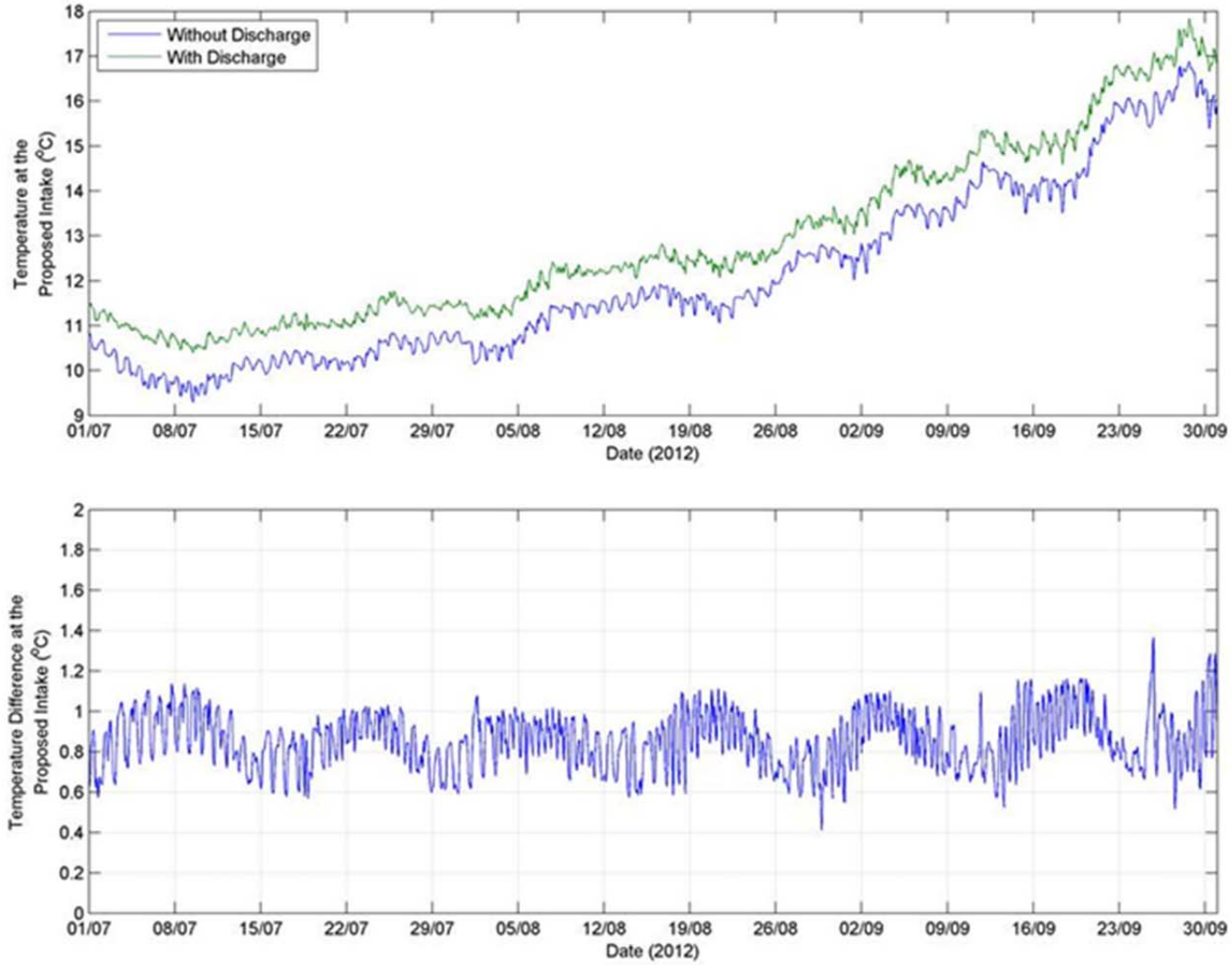


Figure 5: Temperature increase at the proposed intake as a result of short circuiting

10.4 Anti-fouling agent

Issue:

1. Since the literature reports that "Mexel 432" is toxic to at least mussels, fish and algae, Nyrstar must provide the dosing rate of any water treatment chemicals proposed to be used enable an adequate assessment of risk to be made.

Submission(s): 6

Response:

1. As discussed in the PER, the cooling water discharge will be dosed with the surfactant Mexel 432, which is currently used to dose the existing discharge. Rather than being a biocide, Mexel 432 is a surfactant that coats the surface of infrastructure and inhibits settling and attachment by organisms. Nevertheless, as pointed out in the submission, Mexel 432 is also toxic to at least some marine organisms.

   Mexel 432 is increasingly being used as an alternative anti-fouling agent to the more frequently used chlorine based biocides e.g. hypochlorite salts. It is frequently referred to as the 'green' alternative to chlorine, and in 2000 the European Union's Integrated Pollution Prevention Control Bureau (IPPC) classified Mexel 432 as the 'Best Available Technology' applicable to industrial cooling systems (IPPC 2000).

   Mexel 432 was recently assessed by the Australian Pesticides and Veterinary Medicines Authority (APVMA) and endorsed for use in Australia. Their conclusions regarding the ecological risks associated with Mexel 432 use are presented below:

   'The APVMA is satisfied that the proposed use of the new product MEXEL 432 Dispersant containing the active constituents N-oleyl-1,3-diaminopropane and N-coco-alkyltrimethylenediamines for the treatment of seawater cooling systems to prevent corrosion, biofilm formation and attachment of seawater organisms, would not be likely to have an unintended effect that is harmful to animals, plants or things or the environment.'

   The Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC, now the Department of Environment) has assessed data in support of registration of Mexel 432 Dispersant and believes that the application contains adequate environmental fate and toxicity data to demonstrate that the use of the product according to the label is unlikely to present an undue risk to the environment.

   Use of Mexel 432 will lead to intermittent low-level exposure of the marine environment when cooling waters are discharged. The active constituents in Mexel 432 will largely be consumed within the cooling system and are unlikely to persist in the marine environment following discharge because of their strong sorptive characteristics and biodegradability.

Laboratory tests in clean aquaria indicate that Mexel 432 is highly toxic to fish, crustacea and freshwater green algae, but that toxicity is reduced in the presence of organic matter. Toxicity is more moderate under conditions of intermittent exposure that reflect the proposed use pattern. The bioavailability and toxicity of Mexel 432 decline with time because of the strong sorptive tendency and biodegradability of the active constituents.

A conservative risk assessment based on the laboratory test results indicates a potential risk to sensitive marine algae exposed to residues of Mexel 432 in cooling waters discharged to the marine environment. Consideration of the surface active properties and biodegradability of the active constituents in Mexel 432 , and the intermittent use pattern, allows the conclusion that harmful effects on marine life are unlikely, except for some possible suppression of settling by diatoms, and perhaps molluscs given the function of the product, within a short distance of the outfall.

DSEWPaC has recommended that the APVMA be satisfied that the proposed use of Mexel 432 in accordance with good practice would not be likely to have an unintended effect that is harmful to animals, plants or things, or to the environment.

The APVMA has considered the findings of DSEWPaC and accepts these recommendations (APVMA 2012).

The dosing rate of Mexel 432 will remain uncertain until design of the new cooling infrastructure is completed. Nevertheless, based on recommended dosing rates in the literature e.g. Park 2008, it is likely that the initial feed rate of Mexel 432 will be sufficient to obtain a concentration of approximately 2.5 mg/L. The dosing may occur daily for a period of 20 minutes.

Much of the Mexel 432 will be consumed within the cooling water system by coating infrastructure, and it is expected that there will be significant native demand for Mexel 432 within the cooling water from scale and or other particulate material. Using 2.5 mg/L as the target concentration, Park (2008) estimated for a power station in Tennessee that the concentration of Mexel 432 reaching the receiving environment would be conservatively 0.3 mg/L.

A number of studies have examined the toxicity of Mexel 432. The results of acute aquatic toxicology tests of Mexel 432, including short daily exposures, are provided in Mexel's 'Material Safety Data Sheet' (**Table 4** and **Table 5**). The results of chronic toxicology tests undertaken for the use of Mexel 432 in a Tennessee power station and calculated safe dilutions are provided in **Table 6** (Park 2008). Comparisons of the chronic toxicity of Mexel 432 and sodium hypochlorite are provided in **Table 7** (Lopex-Galindo et al. 2010).

The conclusions to be derived from these studies are as follows:

- Short daily exposures (5-20 minutes) of Mexel 432 are 2 to 3 times less toxic than continuous exposures.
- Sodium hypochlorite is 1.5 to 4 times more toxic than Mexel 432.

- The lowest No Observed Effects Concentration (NOEC) for Mexel 432 was 1.25 mg/L.

If as suggested by Park (2008) the concentration of Mexel 432 reaching the environment is approximately 0.3 mg/L (after consumption in the cooling system and native demand by scale and particulates), no dilution would be required to attain the NOEC of 1.25 mg/L. The concentration of the Mexel in the effluent would be approximately 4 times less than the NOEC. More conservatively, the highest concentration of Mexel 432 in the effluent would be the same as the dosing concentration i.e. 2.5 mg/L. A dilution of 1:1 of cooling water to estuary water would be required to attain the NOEC. This would occur within metres of the outfall.

It is concluded therefore that the effects of Mexel 432 on the ecology of Port Pirie River are unlikely to be measurable more than several metres from the outfall.

Table 4: Acute toxicology of Mexel 432 using Lake Superior water amended with 4.5 mg/L humic acids (Mexel 1997)

Organism	Test	Median lethal concentration (mg/L)
Rainbow trout	96-hour	11.0
Daphnia magna	96-hour	3.4
Flathead minnow	96-hour	8.06

Table 5: Acute toxicology of Mexel 432 comparing short daily exposures (Mexel 1997)

Organism	Daily exposure (minutes)	Median lethal concentration (mg/L)
Daphnia magna	5	26.9
	20	7.2
	80	3.0
Flathead minnow	5	13.1
	20	6.2
	80	2.8

Table 6: Chronic toxicology of Mexel 432 for use in a Tennessee power station (Park 2008)

Organisms	NOEC (mg/L)	LOEC (mg/L)	IC25 (mg/L)	Discharge conc. (mg/L)	Discharge safety factor
Flathead minnow *Pimephales promelas* growth	1.25	2.5	2.6778	0.293	4.21
Daphnia *Ceriodaphnia dubia* reproduction	1.25	2.5	2.8237	0.293	4.21

Table 7: Acute and chronic toxicology of Mexel 432 and NaClO (Lopex-Galindo et al. 2010)

Organism	Test	Mexel 432 (mg/L)	NaClO (mg/L)
Microalgae *Isochrysis galbana*	96-hour EC50 (growth inhibition)	4.55	2.91
Dunaliella salina	96-hour EC50 (growth inhibition)	7.21	1.73
Invertebrate *Brachionus plicatilis*	24-hour LC50	3.62	1.23

10.5 Erosion and sediment mobilisation

Issue:

1. Further assessment of the potential for erosion by the cooling water discharge, and mobilisation of contaminated sediments in First Creek and Port Pirie River is required.

Submission(s): 6

Response:

1. Since the First Creek discharge option is no longer being pursued, erosion and mobilization of sediments in First Creek by the cooling water discharge is no longer relevant.

   In the Port Pirie River the cooling water will be discharged from the diffuser ports at an angle of approximately 15-20 degrees into the water column. The exact angle of discharge will be determined at the detailed design phase. The aim will be to ensure

that the cooling water can be discharged at as shallow an angle as possible into the water column (to avoid impinging on the surface), but does not interact with the floor of the estuary.

With the adoption of an appropriate discharge angle, the risk of the cooling water discharge eroding the floor of the estuary and mobilizing bottom sediments will be negligible.

Mobilization of sediments in the Port Pirie River by shipping movements will be slightly greater during construction due to the increased number of shipping movements, but will be similar to the existing situation during the operational phase.

10.6 Piling and underwater noise impacts

Issue:

1. Should piling be required to install the new caisson and diffuser, an underwater noise management plan must be developed to mitigate impacts on marine mammals and other sensitive receivers.

Submission(s): 6

Response:

1. At present there are no plans to install piles into the Port Pirie River. Should piling be required, an underwater noise management plan will be prepared to mitigate potential impacts.

10.7 Effects on *Zostera* communities

Issue:

1. It was recommended that the *Zostera* beds in Port Pirie River be avoided.

Submission(s): 7

Response:

1. The small *Zostera* bed on the tidal flats will be avoided during installation of the cooling water pipeline and diffuser. It is likely that the cooling water pipeline will enter the water adjacent to the wharf and won't therefore need to cross the intertidal flat supporting the remnant *Zostera* bed.

10.8 Biosecurity and invasive species

Issue:

1. New underwater structures should be monitored to ensure they are not colonised by invasive species.

Submission(s): 7

Response:

1. The new underwater structures will be monitored for the presence of invasive species for at least two years following completion of construction activities. Should any invasive species be found, PIRSA Biosecurity will be consulted to determine appropriate actions.

11 Native vegetation and fauna

11.1 Coastal environments

Issue:

1. Clarify and ground-truth presence of *Ruppia* in Figure 12-27.
2. Correction to wording in Section 12.5.11 Seagrass clearance off-sets, and Section 12.6 Construction impacts regarding the mandatory payment to Native Vegetation Fund to achieve a Significant Environmental Benefit.

Submission(s): 7

Response:

1. The map in Figure 12-2 of the PER was generated in 2007. To generate the first map in a time sequence the marine and coastal habitats were mapped using linear transects by Dr David Blackburn. The linear transects were used to identify colour (frequencies) for the habitat categories, these were used to generate the first map from the 2003 aerial photographs using the cues from the 2003 linear transects. Dr Blackburn interrogated the computer generated map using experience in the region, patter recognition and photo magnification (at 30 cm resolution).

   Aerial photographs were taken in 2003, 2005 and 2007 to track changes over time, and each year a new map was generated using frequency cues from earlier maps. The map presented in the PER was the last map of the sequence that is the 2007 map. No further ground truthing was undertaken post 2003.

   Ruppia is a short lived perennial that grows in ephemeral, or at the margins of permanent, saline water bodies such as lakes, inlets, estuaries and tidal lagoons in water from 10 cm to 1 m deep, and also in the mid to lower eulittoral on tidal flats in sheltered bays (eFloraSA: viewed 23 Sep2013.http://www.flora.sa.gov.au/efsa/Marine_Benthic_Flora_SA/Part_I/Ruppia_tuberosa.shtml). As such the area shown on the 2007 map for *Ruppia* should not be interpreted strictly as a permanent feature and with the awareness that (1) the map is derived from aerial photographs collected over 5 years and (2) *Ruppia* is a short-lived perennial. With respect to *Ruppia* the map shows the general area in which *Ruppia* were observed on 3 occasions over a period of 5 years. Ground truthing is not warranted for *Ruppia* other than to confirm that it was in the general area and any ground truthing would need to coincide with the appropriate seasonal conditions.

2. Section 12.5.11 should read: "To offset the potential loss of seagrass associated with the Port Pirie River option for cooling water disposal, Nyrstar will make monetary payment to the Native Vegetation Fund, to achieve a Significant Environmental Benefit (SEB) and compliance with the *Native Vegetation Act 1991*."

   Section 12.6 Construction impacts should read: "Loss of the seagrass will require an SEB offset payment to be made to the Native Vegetation Council."

12 Construction environmental management plan

12.1 Roles and responsibilities

Issue:

1. Improve wording in Table 3-1 (Appendix J: Draft Construction Environmental Management Program) to reflect Nyrstar's overall responsibility.
2. The CEMP must be prepared to the reasonable satisfaction of the EPA and incorporate information regarding the prevention of groundwater contamination.
3. Fate and management of contaminated sediments during construction.

Submission(s): 6

Response:

1. The current draft CEMP will be further refined as the proposed Transformation moves from the Prefeasibility Study phase into a more detailed Feasibility Study phase. Nyrstar acknowledges that as the proprietor of the Port Pirie Smelter, Nyrstar will have overall responsibility. Any final CEMP will reflect this.
2. As stated in the PER and relevant appended report, the EPA approved and appointed Site Contamination Auditor will independently review the relevant EMP documents.
3. The resuspension of sediment in Port Pirie River is an ongoing occurrence from tidal currents, storms and the ongoing shipping and boating activities in the harbour. The levels of heavy metals in the Port Pirie River are well known and documented, as is the marine fauna and flora that have adapted to live in this area over the last 120 years of smelting and ship loading activities in Port Pirie.

   Despite this, Nyrstar agrees with the EPA that resuspension of sediment must be kept to a minimum and not exceed acceptable levels. Nyrstar will instruct its contractors to use methods that generate the least sediment plume and to develop management plans to ensure any sediment resuspension remains at a level that will not harm the environment. In addition Nyrstar will continue to consult with experienced dredging / sediment plume specialist to ensure that the best possible methods are being used to minimise the resuspension of sediment. The CEMP will include all control measures identified by the dredging contractor and sediment plume specialist in the final CEMP.

Furthermore, the dredge spoil will be managed on-site in accordance with the site Groundwater Monitoring and Management Plan or disposed of at an EPA approved location licensed to receive contaminated waste.

12.2 Noise

Issue:

1. If or when noise levels reach a level deemed by the *Environmental Protection (Noise) Policy 2007* to have an adverse impact on amenity (greater than 45dBA L_{eq} and/or 60dBA L_{max}) it will not occur on a Sunday or public holiday or between 7 pm and 7 am on any other day.

Submission(s): 6

Response:

1. Noise and vibration will be addressed as part of the Construction Environment Management Plan and all requirements identified in the PER will be implemented. Nyrstar will schedule construction activities such that the *Environment Protection (Noise) Policy 2007* noise emissions will be met during early morning, evening, weekends and public holidays.

12.3 Dust

Issue:

1. Clarify how lead bearing dust from demolition and construction will be managed and controlled. Any plan must include the ability to take actions and stop work as needed based on feedback.

Submission(s): 6

Response:

1. As stated in the PER, Appendix G: Risk assessment matrix, identifies the potential impacts of dust from Construction and Demolition activities. Current controls identified include: Earth Moving Plan (including dust suppression), Demolition Plan, Material Handling procedures, Waste Management and Recycling Plan. These controls will be in place prior to demolition or construction activities occurring and will be reflected in the detailed Construction Environment Management Plan.

12.4 Cooling water

Issue:

1. The CEMP must provide adequate protection to sensitive biological communities from the outlet pipeline construction.

Submission(s): 6

Response:

1. The discharge of non-contact cooling water will be into the Port Pirie River. This will require the placement of an outfall pipeline on the seabed with a potential to resuspend contaminated harbour sediments. The final design and location of the discharge will ensure that it offers the maximum possible protection of the environment. A risk assessment will be undertaken on the final cooling water outfall plan. Every measure identified to control the re-suspension of marine sediment will be incorporated in the Construction Environmental Management Plan. The target would be to have no significant impact on the marine environment and to be indistinguishable from the current re-suspension of sediment from storms, tidal currents and shipping.

13 Soil, surface water and groundwater

13.1 Impact management

Issue:

1. Appropriate consideration must be given to maintaining the current hydraulic head balance of the surface and groundwater during the construction works, earth movements and the dewatering or recharging of surface water and groundwater.
2. The draft CEMP and draft OEMP in Appendix J and K of the PER, respectively, do not have sufficient detail on the management of acid sulphate soils.
3. Acid sulphate soils component of an Environmental Management Plan should specifically include additional elements.

Submission(s): 6, 7

Response:

1. The risks associated with changes to the hydrogeological regime were identified as key issues in the PER. Where induced changes are anticipated and determined to be potentially significant, they will be modelled using the existing numerical groundwater flow model such that any adverse impacts can be quantified and eliminated (or otherwise managed). Where unforseen changes e.g. climate related, occur, procedures documented in the Construction and/or Operational (depending on project phase) EMPs would be referred to and followed. Impact monitoring, trigger levels (be they water levels or contaminant concentrations) and contingency actions in relation to groundwater and surface water also form part of the Groundwater Monitoring and Management Plan (GMMP).
2. The information presented in the draft CEMP of the PER is appropriate to the stage of approval for the Transformation. Acid Sulphate Soil and Potential Acid Sulphate Soil will be managed in accordance with all relevant state and national guidance. These procedures, including identification, treatment, monitoring and management will be documented in the final CEMP and, if relevant, the OEMP, with both

documents being subject to independent review by the EPA appointed Site Contamination Auditor.

3. The information presented in the draft CEMP of the PER is appropriate to the stage of approval for the Transformation. Acid Sulphate Soil and Potential Acid Sulphate Soil will be managed in accordance with all relevant state and national guidance. These procedures, including identification, treatment, monitoring and management will be documented in the final CEMP and, if relevant, the OEMP, with both documents being subject to independent review by the EPA appointed Site Contamination Auditor.

14 Transport

14.1 Traffic management

Issue:

1. A Traffic Impact Assessment is required in order to assess the effect of the Transformation on the DPTI road network.
2. Has Nyrstar confirmed a location for the proposed worker's village?
3. Has Nyrstar commenced or completed a Traffic Impact Study at the present time?

Submission(s): 15

Response:

1. Chapter 14 of the PER considers the effects on transport and infrastructure of the Transformation. Nyrstar estimate that during the construction phase the road traffic will increase by less than 5% above current traffic levels. Oversized loads are not anticipated, although road registered mobile cranes may be required for the positioning of the modules, and would access the smelter by road. These vehicles have no special requirements in terms of traffic management or infrastructure upgrades.

   Increased road traffic during the construction phase of the Transformation is likely to have intermittent and localised impacts in Port Pirie. Impacts on public roads are expected to be negligible, particularly Main Road in Port Pirie. All parking requirements will be provided within the smelter.

   An appropriate Traffic Management Plan will be developed prior to the construction phase to mitigate and manage potential impacts. The Traffic Management Plan will include the following information which will be provided to the Traffic Services Division (TSD) of DPTI:

   - actual traffic volume data
   - time of day of movements
   - types of vehicles, including detail of any oversize or over mass vehicles and expected haul routes

- assessment of impact on the rail crossings of increased traffic volumes
- current tonnages exported via road, rail and sea respectively
- expected future tonnages exported by road, rail and sea respectively.

2. The location of the proposed construction workforce accommodation has not been confirmed.
3. As of 14 October 2013, Nyrstar has initiated the development of a Traffic Impact Study but it is not yet complete. An appropriate Traffic Management Plan incorporating the information requested by TSD will be developed prior to the construction phase to mitigate and manage potential traffic impacts. This plan will be provided to DPTI – TSD.

15 References

Australian Pesticides and Veterinary Medicines Authority (APVMA), 2012. Assessment of Mexel 432 Dispersant. Commonwealth of Australia Gazette 2012. No. APVMA 5, Tuesday, 13 March 2012.

IPPC, 2000. Reference document on the application of Best Available Techniques to industrial cooling systems. Integrated Pollution Prevention and Control (IPPC), European Com-mission, Directorate-General JRC, 313 pp.

Lopex-Galindo C, Garrido, MC, Casanueva JF and Nebot E, 2010. Degradation models and ecotoxicity in marine waters of two antifouling compounds: Sodium hypochlorite and an alkylamine surfactant. Science of the Total Environment, 408 8, 1779-1785.

Mexel SA, 1997. Material Safety Data Sheet: MEXEL® 432/0. 5 pp.

Park, GG, 2008. Kingston Fossil Plant FIF NPDES Permit No TN0005452 Notification of Mexel 4320 Study for Improved Condenser Performance. Tennessee Valley Authority, Tennessee.

The Ecology Lab Pty Ltd, 2005, Marine Ecological Assessment for the Desalination Planning Study, Report for GHD on behalf of Sydney Water Corporation, Report no. 340405 F, The Ecology Lab Pty Ltd, Marine and Freshwater Studies, Brookvale, NSW.