

# Targeted Lead Abatement Program (TLAP) for Port Pirie

April 2014



Targeted Lead Abatement Program

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## I. Acknowledgements

The Working Group would like to thank the Environmental Health Centre at Port Pirie for their significant contributions to the development of this report.

## II. Glossary

ADHD	Attention Deficit Hyperactivity Disorder
CHSA	Country Health SA
CWG	Communications Working Group
DECD	Department for Education and Child Development
DPTI	Department of Planning, Transport and Infrastructure
EBS	Enclosed bath smelting
EHC	Environmental Health Centre
EPA	Environment Protection Authority
NEPM	National Environment Protection Measures
NHMRC	National Health and Medical Research Council
Nyrstar	Nyrstar Port Pirie Pty Ltd
PPRC	Port Pirie Regional Council
PPTSC	Port Pirie Transformation Steering Committee
TLAP	Targeted Lead Abatement Program
Transformation	The transformation of the Port Pirie smelter

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## 1. Executive summary

### Background

On 3 December 2012, Nyrstar announced that it had reached an in-principle agreement with the Australian Government and the South Australian Government with respect to the funding of a transformation of the Port Pirie smelter (the Redevelopment). The Agreement for funding the project was executed in April 2014. It has been agreed to invest in new technology to upgrade the facility to an advanced poly-metallic processing and recovery facility.

The upgrade to the smelter is expected to significantly reduce emissions of sulphur dioxide and lead. On its own, this is expected to result in a significant reduction in blood lead levels in the community of Port Pirie.

In parallel with the smelter upgrade, Nyrstar and the South Australian Government have agreed to further improve this community health outcome and develop a new Targeted Lead Abatement Program (TLAP).

Currently, approximately 75% of children aged 0 to 4 years have blood lead levels below the National Health and Medical Research Council (NHMRC) guidelines (below 10 µg/dL). As a result of Transformation, it is estimated that the percentage of children with blood lead levels below 10 µg/dL will increase to 90% over a 4 to 7 year period post commissioning (Appendix A).

TLAP has been developed to assess current and identify potential future community lead exposure reduction strategies and assess which are likely to have the greatest impact in reducing children's blood lead levels. The purpose is to enhance existing community blood lead reduction initiatives so as to intensify action to further reduce blood lead levels in children.

### Objectives

The overall aim of TLAP is to increase the percentage of children in Port Pirie aged 0 to 4 years who have blood lead levels within the NHMRC guidelines to up to 95% within 10 years. It is proposed to achieve this through the following broad measures:

- Reduce lead exposure of children more effectively through early intervention;
- Reduce and stabilise legacy lead dust sources;
- Improve public health planning;
- Work with relevant agencies and the local community to improve coordination and collaboration of services; and
- Develop a comprehensive strategy for partnerships and community participation to raise awareness and to achieve the aims of TLAP.

### TLAP initiatives

This report is the result of the work undertaken by the TLAP Working Group. The report identifies and recommends the suggested framework, actions, broad costings and governance principles for the delivery of TLAP.

The following initiatives have been identified by the Working Group as most likely to generate reductions in blood lead levels in children aged 0 to 4 years. These initiatives make up the TLAP sub-programs:

- Broad-scale decontamination of housing (TLAP Committee will investigate this activity following the Redevelopment).

- An enhanced early intervention program that refocuses existing intervention measures to improve the ability and resources for agencies to work with families. The program will include:
  - additional caseworkers and a Project Manager at the Port Pirie Environmental Health Centre;
  - improved data management;
  - resources for residential relocation of high risk families;
  - subsidised childcare; and
  - subsidies for home modifications to reduce lead exposure.
- While this program will target children 0 to 4 years, there will be a particular emphasis on children 0 to 2 years of age and pregnant women. Children who have blood lead levels below 10 ug/dl around the age of 24 months are likely to remain at this level given that blood lead levels tend to plateau around this age. Therefore, a focus on children in the 0 to 2 year age group should greatly enhance the intended aim of TLAP.
- Policy assistance to boost capacity for Port Pirie Regional Council (PPRC) to exercise its role and responsibilities as the local public health authority.
- Dust suppression on-site and in the community in conjunction with a program of cleaning of public spaces.
- Development of stakeholder partnerships and engagement programs to enhance delivery of the sub-programs and to ensure all groups in the community are communicated to and engaged in the most appropriate and effective way.

In developing TLAP program, the Working Group commissioned a rapid Social Impact Assessment within Port Pirie to consider the impact of the proposed initiatives within the community. The outcome of this assessment has influenced the design of the initiatives. The Social Impact Assessment highlighted the importance of a partnership approach to program development and delivery, relationship-based engagement with families, and understanding the barriers and drivers for each target audience to optimise the effectiveness of TLAP.

### **How TLAP will differ from previous programs**

Prior to TLAP there have been a series of Port Pirie community initiatives aimed at reducing lead in blood levels in children aged 0 to 4 years. While certain aspects of the current community lead abatement will continue and others will intensify, the delivery of TLAP will be different from past programs in the following ways:

- The program will increase the capacity for engagement with those particular families with children in the 0 to 2 age group with elevated blood lead levels to provide targeted support to those families;
- The program has a stronger preventative approach, targeting lead exposure reduction strategies in the identified target group (children 0 to 2 years and pregnant women) while maintaining current vital harm minimisation actions offered to all 0 to 4 year old children enrolled in the program;
- Senior personnel from Nyrstar, the PPRC and the South Australian Government are jointly engaged in the design and implementation of the program as parties to a formally convened Working Group.
- The step-change reduction in lead in air achieved from the Transformation will allow a renewed focus on lead abatement initiatives. This would not have been possible in the past due to the level of ongoing smelter emissions; and
- The program will adopt a partnership model of engagement and delivery, practices that encourage stakeholders to have greater levels of ownership of and participation in the solutions offered through the TLAP program.

The TLAP target group comprises:

- children aged 0 to 4 years, with particular emphasis on 0 to 2 years;
- pregnant women; and
- children with blood lead levels above 20 µg/dL.

### Success measures

The Working Group has identified the following measures to assess the program's performance:

- Increased voluntary enrolment in SA Health's lead abatement program with increased number of test results recorded;
- Reduced number of children aged 0 to 4 years with blood lead levels exceeding 10 µg/dL;
  - Proportion of children aged 0 to 4 years and pregnant women with blood lead levels below 10 µg/dL;
  - Geometric mean blood lead level of children aged 0 to 4 years and pregnant women; and
  - Geometric mean blood lead level of children aged 2 years and pregnant women.

There are risks related to the delivery of this ambitious program but these can largely be mitigated through the adoption of effective partnership and stakeholder engagement processes throughout the duration of the implementation phase of the program and through prudent project management principles.

For the purposes of budgeting, reviews and other relevant purposes, TLAP will be implemented on a calendar year basis.

Revenue projections comprise the original elements agreed by Nyrstar and the South Australian Government – a total revenue of up to AUD 30M. The provision of a AUD 5M once-off payment from Nyrstar will be used to accelerate the implementation of TLAP's objectives. Investigating options for the application of these funds will occur as part of the work of the TLAP Committee.

The expenditure forecast over five years has been constructed around the five sub-programs and the cost of governance. The projections include a mixture of ongoing, expanded and new activities. The total expenditure projection is up to AUD 30M. Budget allocations will be reviewed at the end of each 12 months, based on program performance.

The program will take up to ten years to implement and will reflect an adaptive management approach. However, the Working Group has focused on initiatives for the first five years. At the five year point the program will be reassessed.

The initiatives in this report are believed by the Working Group to be the most efficient and effective actions that can be taken to minimise blood levels in children in Port Pirie aged 0 to 4 years following a decision to invest in the Transformation following financial close.

## 2. Background

### 2.1. Nyrstar Port Pirie Smelter

Located on the eastern shore of the Upper Spencer Gulf in South Australia, approximately 230 kilometres north of Adelaide, the Port Pirie smelter has been in constant operation for 125 years. The smelter is owned by Nyrstar Port Pirie Pty Ltd (Nyrstar), a subsidiary of a globally integrated mining and metals business (Nyrstar NV incorporated in Belgium), which has mining, smelting, and other operations located in Europe, the Americas and Australia.

The plant is a primary lead smelter, which also has the flexibility to treat a range of other metal bearing feed material. The Port Pirie operation incorporates a lead smelter and refinery, a precious metals refinery, an acid plant, and a copper plant. It is one of the world's largest primary lead smelting facilities and the third largest silver producer. There is an adjacent dedicated port facility where concentrates are received. Final products are dispatched by road and rail.

The smelter has been an integral part of the Port Pirie community for over a century. It currently employs 850 direct full time equivalents (FTEs), or 18% of the town's workforce, contributing \$524 million to the South Australian economy<sup>1</sup> and sustaining the ongoing operation of multipurpose, multiuser infrastructure, such as the port facilities.

### Risks of exposure to lead

Fugitive airborne lead-contaminated dust is produced during lead smelting operations at Port Pirie. This is then transported by wind and deposited throughout the city and in houses and on properties. This is the primary source of lead exposure for the Port Pirie community, in particular children. Historic sources of lead accumulated through 125 years of smelter operations also provide an ongoing source of exposure.

Lead is a heavy metal not required for human health and it can be toxic when ingested or inhaled.

Governments worldwide aim to implement risk management interventions that will minimise lead exposure in the home, community and workplace (NHMRC 2009). Two key strategies used are identifying the source of lead and remediating or managing the source; and removing individuals from the source of lead exposure. In relation to the Port Pirie community, the focus is on reducing their exposure through changes in behaviour.

The current Australian air quality standard for lead, National Environmental Protection Measure (NEPM), is 0.5 micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ), averaged over a 12 months period.

The National Health and Medical Research Council (NHMRC) position is that all Australians should have blood lead levels below 10 micrograms per decilitre ( $\mu\text{g}/\text{dL}$ ), that all children's exposure to lead should be minimised and that all women should minimise their exposure to lead both before and during pregnancy and also while breastfeeding. Importantly, the NHMRC states that it is not intended that 10  $\mu\text{g}/\text{dL}$  be interpreted as a 'safe' level of exposure or a 'level of concern' rather it is the level at which sources of exposure to lead should be investigated. The NHMRC position is currently under review and the outcomes should be available in early 2014.<sup>2</sup>

Infants and toddlers are at greater risk from lead exposure due to mouthing behaviour, an increased ability to absorb lead, and the susceptibility of their rapidly developing central nervous systems.

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<sup>1</sup> Nyrstar Port Pirie Smelter Transformation Proposal, Public Environmental Report August 2013, prepared in accordance with the Guidelines for the preparation of a Public Environmental Report: Port Pirie Smelter Transformation (Mid North)

<sup>2</sup> [www.nhmrc.gov.au/guidelines/publications/new36new37](http://www.nhmrc.gov.au/guidelines/publications/new36new37)

Lead exposure occurs before birth and infants are born with around the same blood lead level as the mother. After the first month of life, blood lead levels steadily rise in contaminated environments due to increasing daily lead dose which follows normal child development patterns, particularly mouthing and crawling behaviours. Inhalation is likely to provide a small percentage of total exposure but the major route of entry to the body is ingestion of lead from contaminated surfaces such as mouthing contaminated hands or objects. A child's blood lead level tends to plateau and start to decrease after two years of age as they progress to walking and hygiene patterns develop. Older children, adolescents and non-occupationally exposed adults exhibit near normal blood lead levels, except for those who were significantly exposed during early life.

## **2. Addressing elevated blood lead levels in Port Pirie children**

### **Historical program overview**

In March 1983, the South Australian Government formed a Taskforce in response to a survey showing that primary school aged children living in Port Pirie had blood lead levels above 30 µg/dL, the NHMRC level of concern at that time. The outcome of the Taskforce's assessment was the commencement of the Port Pirie Lead Implementation Program. This program took a multi-faceted approach based on environmental health and individual family considerations to address immediate sources and root causes of lead contamination to lower blood lead levels in children.

The Program:

- Established a local Environmental Health Centre (EHC) to:
  - Deliver a community blood lead screening program;
  - Case manage children with elevated blood lead levels, providing family support and counselling; and
  - Deliver community awareness campaigns to raise awareness of lead issues and exposure-reduction education;
- Decontaminated approximately 2,200 domestic residences;
- Demolished nearly 100 properties unsuitable for decontamination;
- Stabilised dust through greening of community land;
- Remediated and stabilised footpaths;
- Initiated a buffer zone between the smelter site and residential areas;
- Increased air monitoring; and
- Provided dust suppression at the smelter site, along with take-home lead reduction initiatives and disposal of contaminated community materials.

Over the first 10 years of the program, the South Australian and local governments and the smelter operators spent in excess of \$35 million to improve children's blood lead levels, from around 2% of children with blood lead levels below 10 µg/dL in 1984 to around 30% in 1994. The program focussed on decontaminating historic lead dust (legacy lead) in the community, but it was realised that recontamination of remediated areas by ongoing smelter emissions was an obstacle to further blood lead level reductions. The program's strategies were refocussed for the next 10 years, shifting away from widespread decontamination of houses towards researching primary smelter sources and mechanisms of household contamination to better understand exposure pathways for children. Blood lead level reductions continued and by 2004 around 50% of children had blood lead levels below 10 µg/dL. But the program's research indicated that significant improvements in children's blood lead levels could not be achieved without major operational changes to reduce the quantity of lead reaching households across the community.

A landmark development occurred in February 2006 with the launch of the Tenby10 initiative. This initiative formalised the partnership between SA Health, the Environment Protection Authority (EPA), Port Pirie Regional Council (PPRC) and Nyrstar to coordinate and focus greater collaborative efforts between the partners. The initiative, which together with the community, aimed to reduce lead exposure and drive action towards an agreed stretch target of at least 95% of children aged 0 to 4 years with blood lead levels below 10 µg/dL by end of 2010. From 2005 to 2010, major operational changes and improvements in the smelter's environmental performance were achieved. A targeted marketing strategy promoting Tenby10 and its objectives achieved greater community participation and engagement. Around \$50 million was invested in emission reduction and exposure reduction initiatives on-site and in the community as part of this program. Despite substantial improvements in children's blood lead levels, increasing the proportion of children below 10 µg/dL from around 50% in 2004 to around 73% by the end of 2010, the stretch target of at least 95% was not reached.

Following the cessation of the Tenby10 partnership, work continued through SA Health's Lead Abatement Program delivered by the local Environmental Health Centre and Nyrstar's Thumbs up for Low Levels community program, but blood lead level improvement trends have slowed and in recent years have plateaued (see Figure 1).

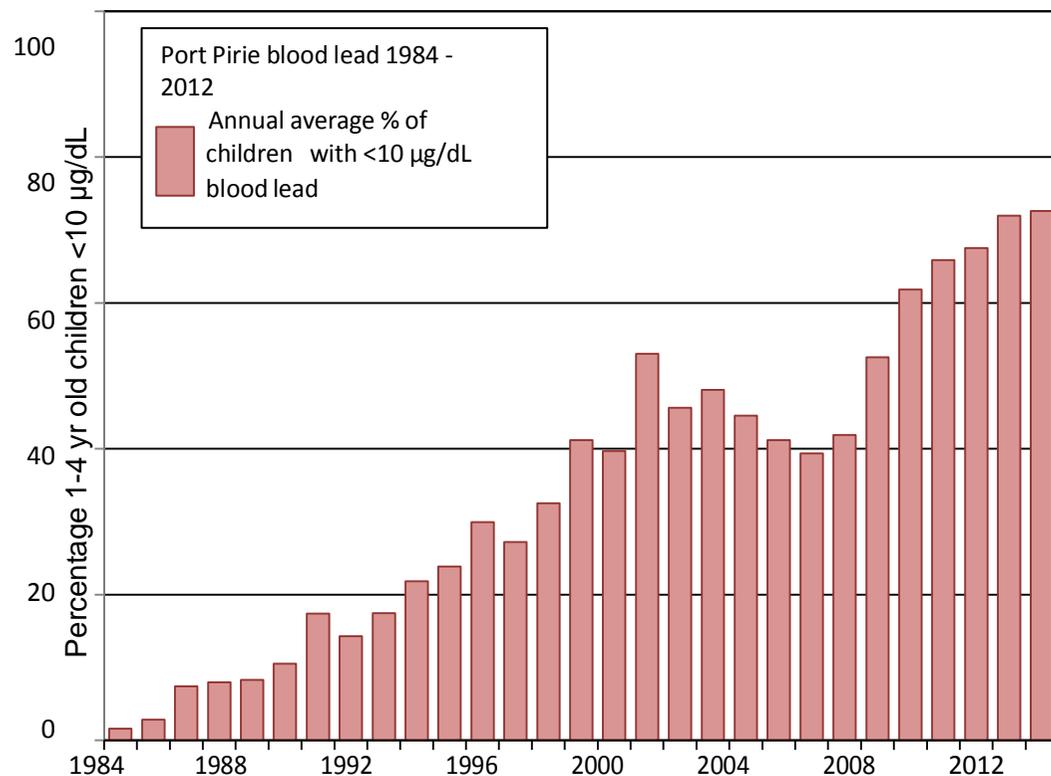


Figure 1. Historical trend in Port Pirie blood lead levels represented by the proportion of one to four year old children with blood lead levels less than 10 µg/dL.<sup>3</sup>

<sup>3</sup> Note on figure comparison: To enable valid comparison with historical data, datasets for some figures have been truncated (removing test results for children under the age of one and surrogate maternal blood tests that are used to represent levels of children under the age of six months). This is due to marked changes in analysis methods over the 20 years represented. In some cases, figures were prepared before complete datasets were available.

In summary, the last 30 years have seen continuous improvement in reducing children’s blood lead levels in Port Pirie. However, it is apparent that further reductions cannot be achieved without smelter technology transformation. The next step-change in community health improvements will come from significantly reduced smelter emissions, achieved by transformation combined with a refocused investment in community support and education through TLAP.

## **Current program status**

As of 23 April 2014, it is estimated that Port Pirie has a population of 837 children aged 0 to 4 years (that is, up to the 5<sup>th</sup> birthday, as projected from ABS data obtained from the 2011 census).

In 2014<sup>4</sup>, the EHC tested 628 children to determine their blood lead levels (including maternal test results which are used as 'surrogate' results until children are first tested at 6 months of age). Between 80.2% and 82.8% of the total population of children aged 0 to 4 years had blood lead levels below 10 µg/dL. This leaves 116 individuals (18.5% of the tested population) with blood lead levels above this level<sup>[1]</sup>.

The impact of current programs on population blood lead levels is shown in Figure 2. This figure clearly illustrates plateauing of blood lead improvements since 2010.

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<sup>[1]</sup> Technical Paper 2012/4, *Analysis of blood lead levels for 2012 (1 January - 31 December 2012)*, SA Health

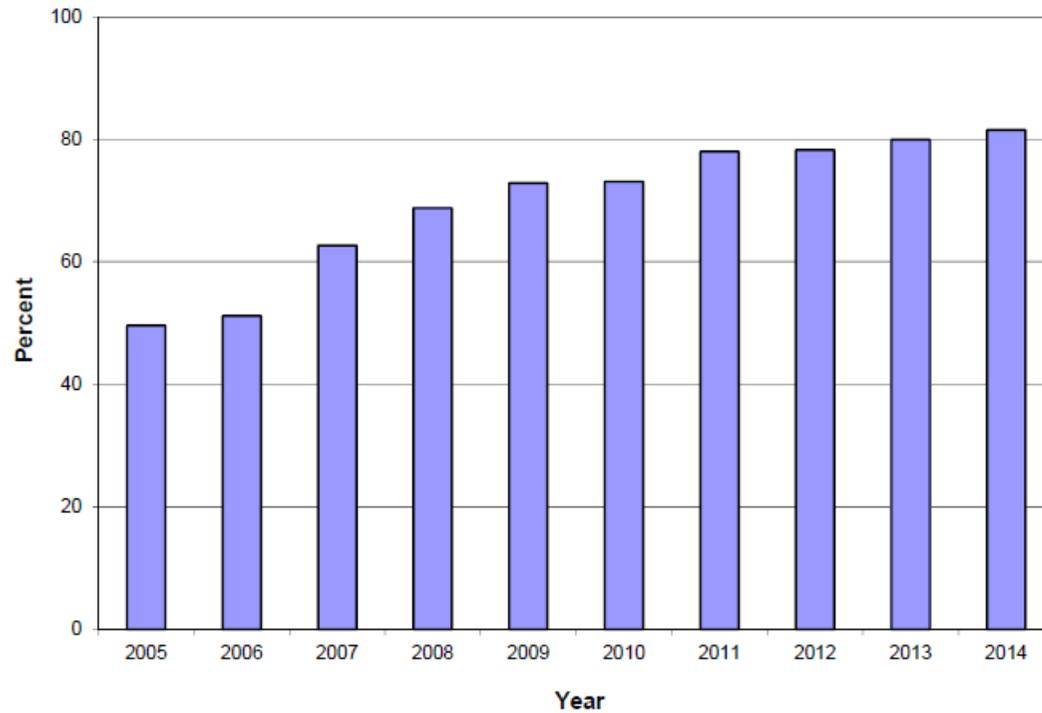


Figure 2. Percentage of children (0 to 4 years old) and surrogates tested with blood lead levels <10 ug/dL for each calendar year since 2005.

<sup>[1]</sup> The most recent complete dataset is the 2014 annual analysis.

<sup>[1]</sup> Technical Paper 2014/4, *Analysis of blood lead levels for 2014 (1 January - 31 December 2014)*, SA Health

NOTE: The Technical Paper 2014/4 - containing the annual analysis of Port Pirie children's blood lead levels for 2014 is available at this link:

<http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/health+statistics/public+health+statistics>

The Public Health Fact Sheet answering FAQs about the blood lead reporting methodology is also available at the website address above.

## SA Health's Lead Abatement Program

SA Health has delivered its Lead Abatement Program to the Port Pirie community for the past 28 years, with the EHC as the local coordination and operations facility. The program currently has 17 staff delivering four key components:

- Community blood screening service;
- Family support services (caseworkers delivering home environmental risk assessments and individual case management for children with elevated levels, where exposure reduction interventions are provided including subsidised childcare and minor home modifications and support to relocate);
- Community health promotion; and
- Operational services (including greening, building maintenance, buffer zone development and maintenance and house and building cleaning).

The program includes a scientific component with research, environmental sampling and data analysis provided by the Port Pirie Lead Investigations Group based in SA Health. This team is responsible for monitoring and reporting blood lead levels and providing the evidence base for exposure reduction strategies used in the program.

The EHC offers lead exposure reduction interventions to families with children aged 0 to 4 years, focussing on children with blood lead levels that are already elevated or levels that are rising. The level of caseworker contact and interventions offered to families intensifies with increasing child exposure risk.

## Thumbs Up For Low Levels (previously Tenby10 and Ten for Them)

The program has since evolved through Ten for Them to Thumbs Up For Low Levels, with the focus now to drive children's blood lead levels down as low as possible.

All iterations of the program have been highly effective in engaging the Port Pirie community around what can be done in the home and the community to minimise exposure and lower children's blood lead levels.

The program implements lead exposure reduction initiatives that are known to have an impact on reducing lead exposure both in the home environment and in the community, including:

- Community engagement – the community is empowered to actively participate in reducing lead exposure through an ongoing marketing campaign;
- Nutrition programs – children who have eaten have a lower lead absorption rate than children who have not eaten, so a daily nutrition program is funded for pre- schools and agencies that care for children 0 to 4 years old;
- Hygiene programs – signs, soap and paper towel for hand drying are provided to all childcare centres, kindergartens and schools in the community who are unable to self-fund these items;
- Exposure reduction equipment – proven exposure reduction infrastructure such as split-system air conditioners, mats, outdoor furniture, vacuum cleaners and storage areas are provided to and maintained in childcare centres, kindergartens and schools;
- Cleaning public playgrounds – a daily wash down and cleaning program is in place for all the community, childcare centres, pre-school and kindergarten playgrounds, to reduce exposure pathways;
- Community greening – tree and shrub seedlings are purchased for planting to minimise dust movement. In recent years these have been given to community groups for planting;

- Street sweeper and footpath sweeper – financial assistance was provided to the PPRC to purchase a street sweeper and a footpath sweeper that clean the roads and footpaths closest to the smelter;
- Dust suppression – mulching, pavers and landscaping is installed at playgrounds, kindergartens and health centres to minimise dust movement;
- Community land remediation – contaminated soil and bark chips in public areas are removed and replaced.

## **The Port Pirie Smelter Redevelopment: a historic agreement**

On 3 December 2012, Nyrstar announced that it had reached an in-principle agreement with the South Australian Government and the Australian Government with respect to the funding of the Redevelopment. The Redevelopment includes investment in new technology to upgrade the facility to an advanced poly-metallic processing and recovery facility.

It was agreed that, in parallel with the smelter upgrade, a new Targeted Lead Abatement Program (TLAP) would be developed for Port Pirie. The aim of the program is to significantly reduce blood lead levels in children aged 0 to 4 years by re-scoping the existing community lead reduction program, and other measures to further refine the program. This report identifies and recommends the suggested framework, broad costings and governance principles for the delivery of TLAP.

It is estimated that the transformational upgrade of the sinter plant will reduce air lead emission levels by more than 50%. Based on standard dispersion modelling principles and an understanding of the other lead dust sources, air lead concentrations are also expected to reduce by more than 50%.

Based on observations of best practice smelters and analysis of air quality data from Port Pirie, the authors of the Environment and Health Feasibility Study (Appendix A) concluded that the average air quality concentration at licensed EPA monitoring sites will reduce from around  $0.4 \mu\text{g}/\text{m}^3$  to below  $0.2 \mu\text{g}/\text{m}^3$  and possibly as low as  $0.1 \mu\text{g}/\text{m}^3$  (Figure 2) (the NEPM standard is  $0.5 \mu\text{g}/\text{m}^3$ ).

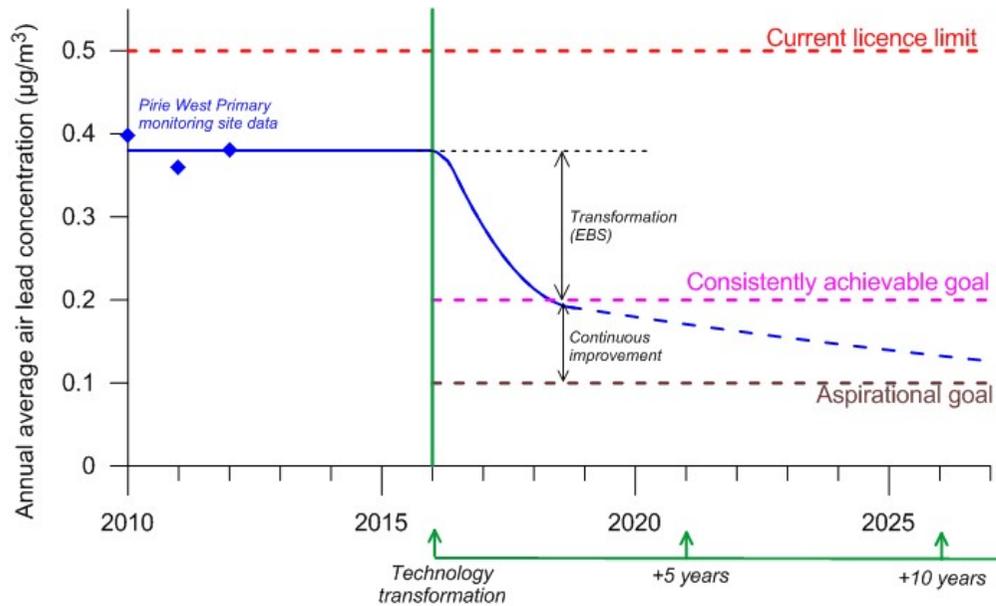


Figure 2. Schematic diagram of projected reductions in air lead concentrations at EPA licensed monitoring sites (Oliver Street and Pirie West Primary School) following the introduction of EBS technology in 2016 and implementation of a continuous improvement program.

Following the Transformation, exposure to historic lead (legacy lead) in the environment will become a relatively larger part of the residual exposure, as a result of lead deposited through historic air deposition and through historic landfill practices over the time the smelter has been operating.

Observations from other smelters show that blood lead levels reduce at a slower rate than air lead following technology transformation. The Environment and Health Feasibility Study estimates that the percentage of children with blood lead levels below 10 µg/dL (78% of tested population in 2012) will increase to 90% over a 4 to 7 year period post commissioning (Figure 4). In combination with the Transformation, TLAP aims to increase the percentage of children in Port Pirie aged 0 to 4 years who have blood lead levels within NHMRC guidelines (below 10 µg/dL) to up to 95% within 10 years.

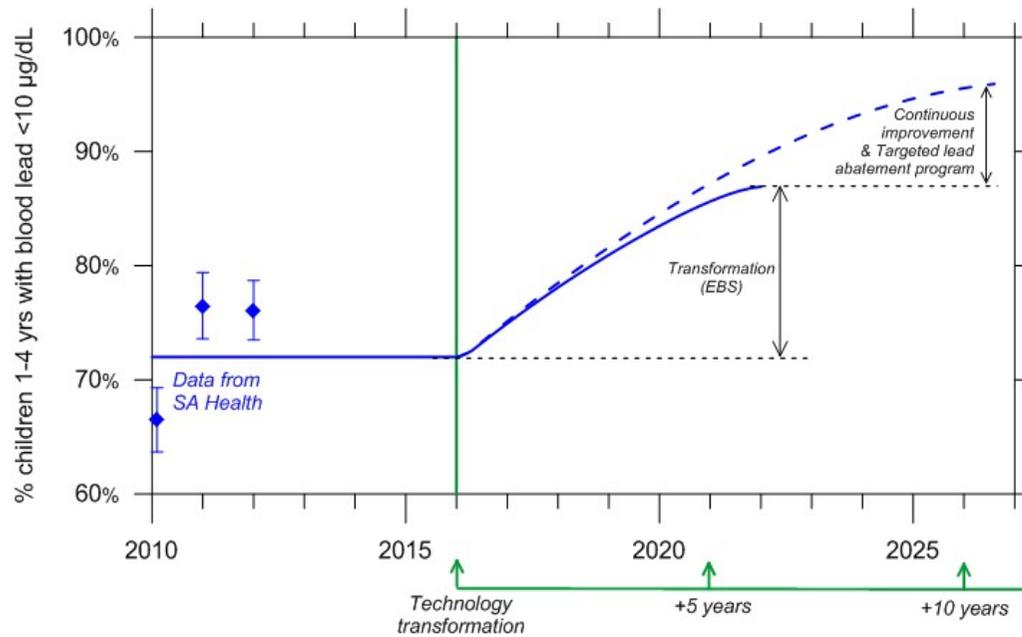


Figure 3. Schematic diagram of projected increase in the percentage of children with blood lead levels below 10 µg/dL following the introduction of EBS technology in 2016 and implementation of the Targeted Lead Abatement Program.

### 3. Targeted Lead Abatement Program

This section outlines the agreement between the South Australian Government and Nyrstar to proceed with TLAP, outlines how TLAP will be different to previous lead abatement programs, summarises the high-level findings of the Social Impact Assessment that has been undertaken on key elements of TLAP, and describes the process used to develop this Report and subsequent steps.

#### Agreement to establish TLAP

In parallel with smelter Redevelopment, Nyrstar and the South Australian Government have agreed to develop in partnership a Targeted Lead Abatement Program for Port Pirie by re-scoping the existing community lead reduction programs delivered by the South Australian Government through SA Health's Lead Abatement Program, and by Nyrstar through its Thumbs Up for Low Levels program (see section 2.3.2).

The Port Pirie Transformation Steering Committee (PPTSC) – a joint Australian Government, Nyrstar and South Australian Government Committee overseeing the implementation of the Transformation – have endorsed the initiatives in this report.

TLAP aims to increase the percentage of children in Port Pirie aged 0 to 4 years who have blood lead levels within National Health and Medical Research Council (NHMRC) guidelines (below 10 µg/dL) to up to 95% within 10 years. Nyrstar and the South Australian Government have committed to TLAP for a period of up to 10 years.

The South Australian Government will continue to contribute \$1.5 million per year, a continuation of its existing Lead Abatement Program through the Environmental Health Centre (EHC). Nyrstar has agreed to commit up to \$3 million per annum for up to 10 years. Nyrstar will also apply \$5 million as an additional contribution to TLAP in a manner to be agreed between Nyrstar and the South Australian Government for the purpose of accelerating the implementation of TLAP's initiatives.

The South Australian Government and Nyrstar have developed TLAP:

- through a partnership approach;
- informed by the findings of the Environment and Health Feasibility Study; and
- building on support for the current and previous programs.

The TLAP Working Group members agreed to jointly scope and cost the sub-program options, and to determine the level and apportionment of funding to assist delivery of the agreed initiatives. The Working Group has considered a comprehensive range of potential exposure reduction initiatives to achieve the objectives of TLAP. These have been outlined in 5 sub-programs as follows:

1. Broad-scale Decontamination of Housing;
2. Early Intervention;
3. Legislation and Policy;
4. Community Dust Management; and
5. Stakeholder Partnerships and Engagement.

## **How will TLAP be different?**

The Targeted Lead Abatement Program builds upon decades of continuous improvement and learning across research, action and education that has been undertaken in partnership by the South Australian Government, PPRC, Nyrstar and representatives from the local community. TLAP intends to be evolutionary, building on the strengths of past programs and learning from them. TLAP will be different from past programs in the following ways:

- The program will increase the capacity for engagement with those particular families with children in the 0 to 2 age group with elevated blood lead levels to provide targeted support to those families;
- The program has a stronger preventative approach, targeting lead exposure reduction strategies in the identified target group (children 0 to 2 years and pregnant women) while maintaining current vital harm minimisation actions offered to all 0 to 4 year old children enrolled in the program;

- Senior personnel from Nyrstar, the PPRC and the South Australian Government are jointly engaged in the design and implementation of the program as parties to a formally convened Committee.
- The step-change reduction in lead in air achieved from the Transformation will allow a renewed focus on lead abatement initiatives. This would not have been possible in the past due to the level of ongoing smelter emissions; and
- The program will adopt a partnership model of engagement and delivery, practices that encourage stakeholders to have greater levels of ownership of and participation in the solutions offered through the TLAP program.

Whereas currently only those who have voluntarily enrolled in the SA Health Lead Abatement Program delivered by the Port Pirie Environmental Health Centre can be targeted, the TLAP target group comprises:

- children aged 0 to 4 years with particular emphasis on 0 to 2 years;
- pregnant women; and
- children with blood lead levels above 20 µg/dL.

### 3.3. Social Impact Assessment

In September 2013, the TLAP Working Group commissioned Quigley and Watts Ltd to undertake a Social Impact Assessment of the proposed initiatives under consideration. The scope of the study focused on three sub-programs (early intervention; legislation and policy; community education). Two other sub-programs (broad scale decontamination of housing; and community dust management) were not considered in the SIA because there are no new initiatives being proposed at this time.

The objectives of the study were to undertake a preliminary analysis of potential social effects of the relevant sub-programs, including:

- potential disengagement or resistance by the community to participation in the proposed TLAP;
- implementation issues (e.g. equitable access); and
- any potential unintended consequences.

The Social Impact Assessment involved meetings and discussions with key local people in the Port Pirie community, development of a social baseline of the attitudes and views of key stakeholders about proposed TLAP activities and a literature review. The results of the SIA relevant to each sub-program are included in sections of this report that follow. Broadly, the report found that:

- The participants were pleased to be invited to contribute on this topic and wanted to congratulate the Committee for undertaking this work collaboratively;
- Many of the issues being raised about TLAP are also challenging health and social interventions throughout the world. The experiences of other communities, organisations and jurisdictions in tackling similar issues are available for consideration;
- TLAP should engage further with other key stakeholders in the community to gain greater insight into the perceptions and experiences of different groups, refine and deliver initiatives;
- A number of focus areas were identified:
  - Enhancing formal and informal partnerships;

- Understanding the different target audiences (particularly high need clients);
- Relationship-based engagement with families and, by this means, developing a family-led plan of action;
- Coordination between services and sharing information;
- Reducing risk of stigma;
- Refocused messaging using a 'social marketing' framework, that is, listening to the needs and desires of the target audience and building the program from there; and
- The concept of 'co-investment' by families of the target group, investigating innovative options to broaden proposed interventions (e.g. childcare) in consultation with community to ensure services offered are likely to be accepted by the community. TLAP will not have the resources to lead broader initiatives, however there is potential for it to be a catalyst for change.

The recommendations from the SIA have been considered by the Working Group in the design of TLAP.

The TLAP Working Group was established in January 2013. The Working Group includes representatives of Nyrstar, SA Health and the Olympic Dam Task Force. Membership was subsequently expanded to include PPRC and Housing SA. The Working Group has met regularly in Adelaide.

The Working Group comprises the following members:

- Julie Mitchell – Independent Chair;
- Gail Bartel – Manager Corporate Communications, Nyrstar;
- Andrew Gilbert – Environment and Approvals Manager, Nyrstar;
- Adrian Beerworth – Regional Counsel, Nyrstar;
- Kevin Buckett – Director Public Health, SA Health;
- David Simon – Director Scientific Services, SA Health;
- Carolyn Lewis – Principal Scientific Officer, Country Health, SA Health;
- Liz Malcolm – Manager Disability Initiative, Housing SA, DCSI;
- Rob Thomas – Chief Scientific Advisor, Olympic Dam Task Force, DMITRE;
- Margot Gall – Project Manager, Olympic Dam Task Force, DMITRE;
- Nicki Crawford – Senior Project Officer, Olympic Dam Task Force, DMITRE; and
- Andrew Johnson – Chief Executive Officer, PPRC.

### **3.4. TLAP Stakeholder Engagement**

TLAP is underpinned by a commitment to work together to define the problems, design the process, create the solutions and deliver the actions. The partners recognise that stakeholder engagement and more importantly the development and fostering of strong partnerships with key stakeholders is essential for the program's short and long-term objectives to be achieved. The timeline of actions undertaken to engage with stakeholders to TLAP are described below.

## January – November 2013

Key steps undertaken to engage key stakeholders in the design of TLAP have been:

- January – April: Discussions regarding existing lead abatement services and programs with the EHC staff and other service providers in Port Pirie, in particular the Regional Health Service, Housing SA and UnitingCare Wesley;
- 30 April: Early intervention (sub-program 2) workshop with representation from the PPRC and state and community service providers;
- June – August: Detailed discussions with EHC, consultation with Country Health SA CEO and Regional Director, York and Northern Health Service; and
- September – November:
  - Consultation with PPRC, SA Health, Department of Education and Child Development;
  - Discussions with key local stakeholders in relation to the Social Impact Assessment, carried out by Quigley and Watts Ltd.

### **3.5. Key assumptions**

The Working Group has made a number of assumptions in identifying and costing the initiatives proposed in this report. The key assumptions are as follows:

1. The proposed investment in the Redevelopment of the smelter will significantly reduce new lead dust contamination in Port Pirie;

Up to AUD 4.5M per annum is available each calendar year, (AUD 1.5M funded by the SA Government through the EHC and AUD 3M funded by Nyrstar) plus an additional \$5 million to accelerate the implementation of TLAP. Funding is on a calendar year basis and needs to be spent within each calendar year. Unspent funds cannot be carried over.

2. The experience of previous programs such as SA Health's Lead Abatement Program and Nyrstar's Thumbs Up for Low Levels program, along with the Environment and Health Feasibility Study – Port Pirie Smelter Transformation (Appendix A) and the Transformation's Public Environmental Report (Appendix B) provide strong evidence for how future investments can optimise the health outcomes of the Port Pirie community;
3. The Social Impact Assessment provides clear evidence as to what initiatives are likely to be embraced by the local community, and under what circumstances; and
4. Nyrstar, the South Australia Government, the PPRC and the Port Pirie community are all motivated to maximise the health outcomes in the local community from the investment in the Transformation of the smelter.

## 4.1. Key constraints

The Working Group has also identified possible constraints to the implementation of TLAP and the achievement of its objectives. The key constraints that have been identified are as follows:

1. Current resources are inadequate to provide appropriate services to all target families and their support agencies;
2. There is limited interaction between support agencies focussed on children 0 to 4 years old;
3. There is a limited understanding of social profiling of the Port Pirie community;
4. Management of health data is inadequate to be able to appropriately direct services to target families; and
5. For some individuals, other health priorities may be higher priorities than reducing lead contamination and blood lead levels.

## 5. Sub-program analysis:

### 5.1. Options considered

The TLAP Working Group considered options for each of the five sub-programs which are summarised in more detail in this report. These options have been assessed for their efficacy and cost effectiveness.

The following sections describe each sub-program. Each section includes the following components where relevant:

- Objectives of the sub-program;
- The rationale for the sub-program;
- Any current activities related to the sub-program;
- The gaps or opportunities to be addressed by TLAP;
- Recommended initiatives;
- Advice from the Social Impact Assessment on the proposed sub-program;
- Key performance measures;
- Projected revenue and estimated expenditure for the first five years of TLAP; and

→ A description of the program logic behind the sub-program.

### **Sub-program 1: Broad-scale Decontamination of Housing**

#### **Rationale**

Lead dust in houses is a major pathway for lead exposure by children in Port Pirie. A ten-year decontamination program commenced in 1984, focussing initially on decontaminating the houses of children with elevated blood lead and then on systematic decontamination of all the most contaminated residential areas of the city. However, any improvement was temporary due to recontamination primarily from ongoing emissions. A 1993 study established that, while the legacy lead in houses was a contributor, the main source of lead exposure was air-borne material from the smelter. Decontamination of home environments reduced blood lead for at least six months however, beyond that, recontamination diminished the impact of the home decontamination.

Thus, previous efforts at broad-scale decontamination of lead from houses have delivered short-term benefits for significant financial costs. Lead recontamination rates in thoroughly cleaned houses are similar to those in uncleaned houses, suggesting that recontamination is from new material rather than existing dust being redistributed within the house. The cost of decontaminating a single house has been estimated to be at least \$25,000.

If broad-scale decontamination of housing is to be effective, it should only occur after the Transformation has been commissioned and emissions are substantially reduced.

#### **Current activities**

There is currently no investment in targeted, broad-scale decontamination of housing in Port Pirie.

#### **Recommended activities**

No activities are proposed until the upgraded facility has been commissioned in 2016.

In 2016–17, there should be sufficient data from the implementation of other sub-programs to undertake a cost-benefit analysis of implementing housing decontamination compared with other options.

#### **Advice from Social Impact Assessment**

This sub-program was not included in the Social Impact Assessment.

## **5.2. Sub-program 2: Early Intervention**

#### **Rationale**

Children 0 to 4 years of age are at most risk from lead exposure. Typically, blood lead levels rise with age from birth in contaminated environments due to a steep increase in the dose children ingest, which is related to their motor development and mouthing behaviour in the first two years of life. Interventions that reduce lead exposure before a child

reaches two years of age are likely to disrupt this escalation of blood lead levels, and reduce the peak levels that a child would have reached without intervention. In addition, interventions directed at children under the age of two appear to have greater impacts on reducing children's blood lead levels than interventions delivered after the age of two, suggesting that blood lead levels are more responsive to interventions reducing lead dose during the earlier age period.

For this reason, sub-program 2 defines the key target group for the sub-program as children aged 0 to 2 years, pregnant women, and those children at greatest risk of harm with blood lead levels above 20 µg/dL.

An enhanced preventative program is needed to focus efforts on reducing lead exposure before children reach 2 years of age while their blood lead levels are likely to be more responsive to interventions that reduce lead dose.

Evidence supports the proposition that caseworker interaction is the most effective mechanism to sustainably reduce children's blood lead levels and keep children's blood lead levels below 10 µg/dL, as well as being an operational necessity to deliver exposure-reduction interventions to families because they are generally the first point of contact with the program and most times, the only contact. Caseworkers are skilled workers who build rapport and trust with the family, which is essential to encourage long-term participation in the program.

Unless professional and expert linkages are made, families will not usually participate voluntarily in exposure-reduction strategies or readily accept offers of interventions. In terms of preventing elevated blood lead levels, caseworker interaction is considered to be the foundation of a multi-faceted approach required when working with families to reduce blood lead levels. Caseworkers coordinate multiple strategies including home lead assessments to prioritise and customise exposure-reduction interventions; and they facilitate lead awareness raising and drive behavioural change to maximise effectiveness of interventions.

Reductions in blood lead levels that can result from caseworker interactions are likely to be more sustainable than those occurring after residential relocation. If embedded effectively, lead awareness and behavioural change are likely to result in a child and family that are more resilient to lead exposure occurring outside the home or may reoccur in a relocation residence. For these reasons, caseworker interaction is considered the most effective strategy recommended within sub-program 2, and the strategy that needs to be delivered to all families first. It is also the strategy that is likely to be most readily accepted by families.

Evidence from Port Pirie case studies supports that reducing the time children and pregnant women spend in highly contaminated living environments (therefore reducing their daily lead dose) through: 1) partial or complete relocation; and 2) reducing levels of lead contamination in living environments through home modifications, will reduce children's blood lead levels.

Voluntary residential relocation from a high lead exposure risk environment to a low exposure risk environment is likely to provide the greatest magnitude decreases in children's blood lead levels if the child does not continue to spend significant time in high exposure-risk environments. Subsidised childcare is likely to benefit a greater proportion of cases than relocation or home modifications and still provide a clear blood lead level reduction. Home modification cases tend to have smaller decreases in blood lead levels but this may be the result of the limited scope of home modifications that are currently able to be offered within existing budget.

### **Current activities**

The South Australian Government invests approximately AUD 1.56M per annum through SA Health into a Lead Abatement Program delivered by the EHC.

→ *Environment Health Centre*

- The EHC offers lead exposure-reduction interventions to families with children aged 0 to 4 years, focussing on children with blood lead levels that are already

elevated or levels that are rising rapidly. The level of caseworker contact and interventions offered to families intensifies with increasing child exposure risk.

- According to ABS 2011 census data, there were 868 children aged 0 to 4 years living in Port Pirie. EHC data indicated that 641 children and pregnant women were tested in 2012.
- 254 children had a caseworker assigned as of 2 August 2013, noting that caseload changes regularly<sup>4</sup>.
- Current caseworker resources are 2.8 FTEs, with an average caseload of 85 per caseworker
- The current client database does not have the functionality to effectively implement, report on and evaluate sub-program 2 while maintaining SA Health's responsibility for confidentiality of personal medical information.

→ *Residential relocation*

- EHC may assist families who are planning to relocate to a low exposure risk environment, but residential relocation is rarely initiated by the EHC under the current program. Over the past seven years, 25 families have been assisted with relocation (ranging from 0 to 9 families assisted per year) with an average cost of \$16,000 per year ranging from \$80 to \$10,000 per family, which includes funding a range of services including trailer hire, fuel, taxi vouchers, packing tape, storage boxes, final utility bills and final rent and bond.

→ *Subsidised childcare*

- EHC subsidises childcare for approximately 50 children a year at a cost of \$80,000 per year (note that subsidised costs vary substantially for each child as a result of: 1) the different time periods of placements required determined by individual exposure risk e.g. 1 day per week to 5 days per week and 2 months; and 2) the family's eligibility for Australian Government childcare rebates.
- Nyrstar provides funding to two childcare centres for exposure reduction interventions including infrastructure, hygiene supplies and nutrition programs of around \$40,000 per annum.

→ *Home modifications*

- EHC funds minor home modifications and yard soil barriers, but investment has not been more than \$2,000 per family. Nyrstar funds up to six yard landscaping projects per year ranging in value up to \$6,000 per project.
- From 2006-2013, 125 families have received a range of home modifications including window repair, yard soil stabilisation, door seals, lawn seed and gap sealing.

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<sup>4</sup> This equates to about 40% of the TLAP target group having a caseworker

## Gaps or opportunities

- 60% of the target group of families are not assisted by the EHC due to a lack of caseworker and other resources;
- Not all children who would benefit from childcare placements have access to subsidised childcare;
- Not all families who would benefit from home modifications have access to resources to undertake those modifications, refurbishment and/or installation of yard soil barriers to reduce indoor legacy lead;
- There are a small number of cases where a child's lead levels would benefit most if the family could be relocated; and
- Collation and retrieval of information relevant to target family groups is inadequate due to information being split across multiple databases and paper-based reporting

processes.

### Recommended activities

The first step of sub-program 2 is to assess the baseline exposure risk of the 60% of the target group who currently do not have a caseworker assigned. This first step requires a caseworker to visit each child and pregnant woman in the target group. This would increase the overall caseload and increase the preventative focus (ie. working with children aged 0 to 2 years with blood lead levels below 10 µg/dL) from about 25% to about 60% of the caseload.

Once the baseline risk of the entire target group has been determined, the second step is to prioritise and customise interventions to be offered to each family. The Australian Centre for Social Innovation (TACSI) has been contracted by Nyrstar to identify opportunities to improve EHC services and service delivery.

TACSI was established in 2009 with seed funding from the South Australian Government, with the vision of creating a national centre of excellence in social innovation that could be a catalyst for widespread change. In addition to their own programs, TACSI are now working with many organisations to build their internal innovation capability and increase their impact.

TACSI conducted a workshop in May 2014 funded by CHSA to give EHC, allied agencies and key stakeholders exposure to their methods and the potential benefits of new approaches to engagement of the target audience.

Final approval for this project was given by the SA Health Human Research Ethics Committee on 18 February 2015.

Strategies to create positive change for children at high risk of lead exposure in Port Pirie, particularly for those families with complex needs that have children at high risk of lead exposure who engage lightly or do not currently engage with the program will be developed. Strategies to engage families with children in the target group who are not high risk but who won't/don't engage with the EHC will also be developed.

It is expected that TACSI's innovative and successful methods of engagement and research will allow targeted training to be delivered to SA Health staff to enable them to better understand their clients and what they value using contextual research tools.

Together TACSI and SA Health staff will develop a Business Model Canvas for Change for new/improved service delivery models and a framework to deliver the prototypes.

The full range of early interventions recommended under sub-program 2 (see Table 3) are intended to be offered in addition to interventions the EHC currently offers families under existing protocols—current services provided to all children aged 0 to 4 years at risk from lead exposure will continue.

Changes to the current approach will:

- Start family-led education earlier to increase resilience to lead contamination in living environments;
- Increase support of and communication with families between blood tests;
- Reduce the time children spend in highly contaminated living environments;
- Reduce contamination levels in living environments; and
- A further opportunity to enhance the benefit of childcare by co-locating a caseworker in the childcare centre will be considered. The development of relationships between caseworkers and families would be improved by proximity and the mutual involvement in the activities of the centre.

A number of intervention strategies have been considered by the Working Group.

A description of the activities and their expected outcomes is presented in Program effectiveness will be measured in terms of reducing blood levels in children 0 to 2 years and operational service delivery within available resources.

The effectiveness of strategies will vary depending upon each family's circumstances (e.g. their willingness to learn and change exposure behaviours or interact with the EHC). Some cases may require a combination of interventions before blood lead levels will reduce (e.g. home modifications or relocation may be required if family support and subsidised childcare is unsuccessful). In some instances, it may be necessary to prioritise other social issues above lead exposure reduction, such as domestic violence, substance abuse or poor health. These cases are referred to the appropriate agencies.

## **Advice from Social Impact Assessment**

### *Enhancing the EHC*

Enhancing the early intervention program of the EHC was strongly supported by stakeholders surveyed as a part of the Social Impact Assessment.

There was a view that Port Pirie government and non-government support agencies could work in a more coordinated manner. Participants believe it is critical that these support agencies are more closely aligned and work better together. Investigating how to share information and enhance partnerships between support agencies is recommended.

Participants did not support any reduction or change to the EHC's health promotion activities.

Participants were concerned about whether children older than two years with blood lead levels greater than 10µg/dL would receive ongoing intervention from the EHC. It will need to be communicated and emphasised to the community that current EHC services for these high risk children will continue – TLAP recommendations are in addition to existing services.

There are several different demographic groups within the target group in Port Pirie which would benefit from greater intervention. The SIA indicated that it is very important to understand each of these demographics, how the needs of each differs from others, and how they can be best engaged to deliver the goals of TLAP. Undertaking a social profiling exercise within the community will be vital in the delivery of early intervention.

### *Residential relocation*

Maintaining the current ability to undertake a small number of voluntary residential relocations was seen as helpful by participants in the survey, but they raised a number of

potential concerns. Where voluntary residential relocation is undertaken there was support for the use of social housing providers to facilitate relocation because of the range of support services they can offer families. Further discussion with landlords, property managers and families who rent was recommended by participants to further develop the details of this proposal if it is carried forward.

#### *Additional childcare*

Financial support to access childcare was well supported as a means of intervention. Improving the clarity about the benefits and disadvantages of childcare was suggested by participants in the SIA to maximise uptake.

Having multiple childcare placement options to offer families was seen as a useful extension to this sub-program. Options exist for further exploration, including expanding existing services, creating new childcare centres, resuming investment in previous parenting groups and considering different frameworks such as parent-led options (e.g. following the Play Centre model). Talking with the families was recommended by participants because it would be helpful in understanding their individual needs and the best and most readily accepted options with which to proceed.

#### *Home modifications*

Home modifications are generally supported by participants. It was recognised that some houses may be too deteriorated and measures should be taken to ensure investment is appropriate.

TLAP should consider including rental properties in the housing modification intervention, however clear criteria for accessibility will be required.

### **5.3. Sub-program 3: Legislation and Policy – Working Collaboratively with the Port Pirie Regional Council (PPRC)**

#### **Rationale**

Following Transformation, emissions of lead will significantly decline and legacy lead accumulated over many years in the form of dust will become a more relevant source of lead exposure for children in the Port Pirie community. The legacy lead dust is widely distributed in the city and can readily become airborne and enter dwellings and public areas.

Exposure of the community to legacy lead may be reduced through the application of various policies and legislation, including: 1) development, environment protection and public health legislation; 2) internal policies of government agencies; and 3) development policies in local government. Policies could also be used to improve coordination between government agencies in implementing lead abatement strategies.

TLAP has identified that the *South Australian Public Health Act 2011* (the Act) may contain additional means to reduce legacy lead exposure. Potential for resource-efficient avenues to reduce legacy lead exposure through the Act is the focus of proposed actions under this sub-program.

Whilst some mechanisms under the Act have already been identified by TLAP, further consideration will need to be given to other provisions to determine whether they are viable under TLAP. It is proposed that a workshop will be held to further investigate these provisions, as well as additional legislation that can be utilised to reduce historical lead exposure (for example, current and proposed housing improvement legislation). At this stage, it is envisaged that the workshop would be attended by Nyrstar, PPRC and the South Australian Government.

#### **Current Activities**

The PPRC is responsible for the administration of the Act in its local area.

The Yorke and Mid North Region Plan, a volume of the South Australian Planning Strategy which covers the Port Pirie area, is currently being reviewed and updated. TLAP Working Group members have provided input on lead-sensitive considerations during the drafting process. Environment protection legislation is already applied through regulation of Nyrstar's operations (principally through its operating licence). Ongoing emissions of lead into the air by Nyrstar's smelter operations are the subject of EPA licence arrangements. Sub-program 3 is not intended to impact on these arrangements or further regulate emissions from the smelter or otherwise to assign responsibility for legacy lead.

### **Gaps or opportunities**

The PPRC is the local health authority under the Act, and is required to prepare and report on a regional public health plan for the community with policies and strategies to address and reduce legacy lead exposure. However, this is a significantly more difficult requirement for PPRC than for other local councils, and additional resources are required for it to be effectively implemented.

### **Recommended activities**

SA Health will assist the PPRC to develop its Public Health Plan and incorporate lead exposure reduction strategies. An additional staff member with expertise in legacy lead management will be recruited by the PPRC to oversee and enforce lead abatement strategies under the plan.

It is proposed that a workshop will be held to further investigate the Act and other legislation for tools that could be used to reduce legacy lead exposure (for example, current and proposed housing improvement legislation). It is envisaged that the workshop would be attended by Nyrstar, PPRC and staff from South Australian Government agencies that are familiar with the relevant legislation.

### **Advice from Social Impact Assessment**

Sub-program 3 had tentative support from most participants, and substantial support from EHC. It is not the intent of this sub-program to create onerous or punitive requirements for councils, developers or the community. It is important that the sub-program take a partnership approach to delivery and consult widely before adopting new policies or legislation.

The following ideas were proposed as potential focus areas for legislative and policy reform:

- Improve standards for dust management of building demolition, noting that TLAP should consult tradespeople about the sub-program;
  - Provide disincentives for landlords to rent their properties to young families in the high risk zone;
  - Increase restrictions on the plumbing of rainwater to bathrooms in Port Pirie, as rainwater contains lead;
  - Increase incentives or requirements for children's playgrounds to include hand washing/drying facilities, particularly where there are also picnic tables;
  - Review requirements of childcare centres in Port Pirie to have 'play in dirt' and 'eat food grown by the centre' to achieve Federal accreditation;
  - Review of the use of blowers on the main street to move leaves;
  - Review cleaning standards and associated funding for key community facilities;
  - Review with the Department of Education and Child Development the diagnosis of children who have high blood lead levels with ADHD and are treated with medication;
- and

- Review internal policies and procedures with bank lenders. There is a potential role for banks to require a pre-purchase inspection, or have an internal policy for purchases in Port Pirie.

Related to the above issues, participants described the existing legislation and policies as not being used to their full effect. Consideration of this within sub-program 3 was requested. For example:

- Child neglect is reportable, but a blood lead level of 20-30 µg/dL does not rate on the Families SA priority list compared with domestic violence or sexual abuse (noted by EHC);
- Children under 'Guardianship of the Minister' are not automatically enrolled in EHC programs (noted by EHC).
- State-wide policies seldom make special dispensation for Port Pirie. The exception was the use of water and the application of water bans during the previous drought (noted by Government, business, PPRC, EHC); and
- One EHC participant asked whether a Section 56 compliance notice under the Act could be presented to landlords regarding dust egress into houses in the high risk zone (noted by EHC).

#### **5.4. Sub-program 4: Dust Management for Community Land**

##### **Rationale**

After more than 124 years of continuous smelter operations, lead contamination in Port Pirie is wide spread with exposed soil and dust deposition being a significant source of lead exposure to children 0 to 4 years in the community. In particular, public spaces can be reservoirs for lead bearing dust that can mobilise and become a source of lead exposure for children 0 to 4 years. By removing or stabilising legacy lead dust in Port Pirie, the risk of lead exposure for children 0 to 4 years can be reduced.

Numerous community based lead exposure reduction initiatives are in place to mitigate this exposure, however while current emissions from the smelter continue, these initiatives will have a limited effect on minimizing lead exposure from soil and dust in the community

During the pre-Transformation phase, the focus is on defining the various public areas of Port Pirie that need attention with respect to dust stabilisation and control. Investigative work is required to determine which public areas need attention and to establish priorities. During the post-Transformation phase, on-the-ground work can be carried out according to the priorities and making use of the dust stabilization methods that have been developed.

Prior to commissioning of the new facility, the focus for this sub-program will be on:

- the continuation of current dust suppression initiatives in the community; and
- identifying what additional dust suppression initiatives could be implemented to further reduce exposure in the community.

Additionally during this phase, TLAP will work to define other significant public areas of Port Pirie that need attention with respect to dust stabilisation and control. Once the new facility is commissioned, this work will be carried out according to the priorities and dust stabilization methods that have been set as an outcome of the work undertaken prior to commissioning (Task 4.1, described in Table 7).

A recent SA Health report<sup>5</sup> presented results from a survey conducted in 2012 of soil lead concentrations in council-managed public land sites including footpaths, nature strips and public parks across the city. Twenty per cent of the sampled sites had lead concentrations above 600 parts per million, which is the National Environment Protection Measure—Health Investigation Level for public spaces. This is the concentration recommended to trigger further investigation of the site. This report recommends reinforcing community-wide dust suppression and stabilisation strategies to prevent lead in soil in public areas from mobilising and contributing to the contamination of nearby residences on windy days or during dust-raising activities such as demolitions, excavations, road works and recreational activities.

### **Nyrstar On site Current Activities**

The current Nyrstar lead abatement program Thumbs Up for Low Levels has implemented a range of community initiatives and achieved significant results in reducing lead exposure in the community. The current program has been in place since 2008. It involves both specific community exposure reduction initiatives and initiatives undertaken on Nyrstar's site which have the effect of reducing lead emissions that would otherwise leave the site and reach the community. The existing expenditure on community lead exposure reduction initiatives is approximately \$230,000 per annum. Expenditure for on-site initiatives by Nyrstar is approximately \$660,000 per annum.

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<sup>5</sup> Port Pirie Soil Lead Concentrations Report, 2013. Port Pirie Council  
<http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/health+statistics/public+health+statistics>

### **Port Pirie Regional Council (PPRC) Current Activities**

The PPRC has implemented a range of activities aimed at minimizing exposure and reducing dust movement in the community. Specifically these initiatives include:

- Cleaning public facilities; Full time road and footpath sweepers undertake a cleaning regime in the CDB and areas closest to the smelter. Additionally the PPRC regularly cleans play equipment and street furniture;
- Buffer zone management; The PPRC takes possession of properties purchased by the EHC as part of the North of Frederick road buffer zone plan and liaises with utility providers to rehabilitate the properties;
- Public open space management; Using water accessed from the Nyrstar Water recycle plant, the PPRC irrigates and greens public spaces as well as regularly mulching and covering exposed soil; and
- Dust Management; All development applications for demolition and land division approved by the PPRC are required to adhere to a dust management plan, which is enforced by the PPRC.

### **Gaps or Opportunities**

- Increase the buffer zones between residential and other land-use areas and establish land rehabilitation protocols and management plans;
- Reduce lead dust mobilisation through increased greening and mulching programs;
- View operational effectiveness of current road and footpath sweeper and review what improved sweeper opportunities exist for possible purchase; and
- Increase community awareness to minimise dust generating activities; and

→ Identify further possible dust management initiatives.

### Recommended Activities

It is proposed to provide an expanded program for dust management for community land to reduce risk of lead exposure. The following targeted remedial efforts are proposed, following a planning workshop with key stakeholders:

- Maintain and increase where appropriate the community wash-down program (strong current focus on community play equipment and community facilities);
- Establish a program to clean up public buildings with the greatest risk of lead exposure (e.g. Main Street Museum);
- Implement dust prevention and management measures related to building construction, modification, demolition and public works;
- Replace existing street sweeper with an improved sweeper and expand the existing street sweeping program.
- Improve the greening of private land through:
  - (1) Low-priced water supply for cleaning sources of lead exposure. The following options will be explored:
    - Short term (0-5 years): expansion of the Community Service Obligation funding provided to SA Water;
    - Long term (5 years +): Strategic town water supply; and
  - (2) Engagement with the community regarding the benefits of using private water supply to achieve reduction in lead exposure.
- At a minimum, maintain current on-site initiatives specifically targeted at cleaning, greening and reducing emissions; and
- Stabilise dust in open public spaces and the rail corridor through a targeted revegetation and landscaping program.

### Advice from the Social Impact Assessment

This sub-program was not included in the SIA.

## 5.5. Sub-program 5: Stakeholder Partnerships and Engagement

### Rationale

Active participation by the community has been a key success factor in reducing lead exposure and children's blood lead levels in Port Pirie over the last 30 years, particularly since 2006. This success has been largely due to increasing awareness and engagement of the blood lead reduction programs by the community. The community lead reduction strategies to date have been driven by the Environmental Health Centre and Nyrstar.

There is a need to change the approach in the construction of and delivery of TLAP to further improve the blood lead levels in children in Port Pirie. The SIA highlighted the benefits of changing the model of community engagement from one of instruction, direction and information giving, to one of encouraging joint ownership and development of the solutions to this issue.

Gaining a better understanding of the target group is key to this approach, so that the communication and engagement program has maximum impact for the entire TLAP. To achieve this, it will be necessary to undertake further consultative work in the community.

## Current activities

The ongoing community engagement and awareness campaigns since 2006, under the banners of Ten by 10, Ten for Them and Thumbs Up for Low Levels are described in section 2.3.2. There have been many positive changes in the community as a result of these successful programs. These programs have all had a strategic community engagement methodology, which aimed to assist the community to accept that there is a blood lead issue and to take steps to lower blood lead levels. It has achieved this through an honest, open and active communication approach by all stakeholders and through multiple communication messages and delivery platforms. For example:

- Television campaign;
- Radio campaign;
- Community billboards;
- Printed materials (fliers, posters, brochures);
- Face-to-face; and
- Website.

As a result of the program, community sentiment has shifted from apathy in some respects to wide acceptance of the community blood lead issue, as well as support for numerous community-based lead exposure reduction initiatives.

## Outcomes from the Social Impact Assessment

All participants were pleased to be invited to comment on TLAP sub-programs and were highly supportive of the need for ongoing community education and interaction to support future reductions in children's blood lead and the implementation of TLAP initiatives.

Key outcomes of the survey responses included:

### *Partnerships*

- TLAP should give explicit consideration to the establishment of additional formal and informal partnerships, particularly between government agencies already active in the community in its implementation. This may require a designated liaison role to coordinate multiple agency responses to high need families;
- Existing relationships are strong, especially between Nyrstar and EHC, and there is an appetite for more involvement by other groups such as NGOs in the community. Roles could be explored in future governance and partnership arrangements; and
- TLAP may need to accept that blurring of identity between the partners may actually increase with closer partnership arrangements. How this would possibly impact in the implementation of TLAP is to be considered.

### *Messaging*

- Existing messaging from previous campaigns has positive aspects, though relevance and reach may need to be modified to deliver maximum impact to specific demographic groups. The messaging about the positive aspects of the Transformation is requested to be aimed at those living outside Port Pirie to assist in changing the negative image of the community;

- It is critically important to have consistent messages;
- Face to face delivery of messaging or those mediums that support this (TV and Radio) is preferable than written material for highly disadvantaged families;
- Early intervention initiatives will require specific demographic targeting and greater levels of interaction with the community;
- The message and its timing is critical to reduce the risk of creating false hope or expectations at a community and family level regarding how the Transformation might positively affect blood lead levels. Carefully framing the messages to ensure that the blame or responsibility is not passed solely to the community or families post-Transformation will be important; and
- Messaging that puts the responsibility for reducing blood lead solely on parents has the potential to contribute to stigma experienced by families with elevated blood lead. TLAP must consider development or pre-testing of all resources with the client groups.

It is anticipated that workshops will be held with key stakeholder partners to develop messaging and ensure it is relevant and targets key demographic groups.

Additionally it is desirable that resources be allocated to profile the targeted demographic groups in the community and that an additional Social Impact Assessment be undertaken once the TLAP has been implemented to further engage the community and stakeholders in its implementation.

### Gaps or opportunities

TLAP is a vital element of Transformation, and it remains critical that community and stakeholder engagement and partnerships are maintained throughout the pre- and post-commissioning phases. The Stakeholder Partnership and Engagement Strategy will build on previous community engagement and communication campaigns, some elements will continue in a reduced form and some new elements will be introduced. The SIA has identified that building stronger partnerships with target groups and other key stakeholders will improve the effectiveness of a renewed campaign. Additional consultative work through workshops or focus groups will be undertaken with target groups and key stakeholders. This will identify opportunities for improved communication and interaction with targeted demographic groups.

Additionally the Social Impact Assessment has identified that there has been a change in the way the community talks about the lead in blood issue from one of denial a decade ago to one of acceptance and ownership of the issue. However, the study also identified that where messaging places the responsibility for reducing blood lead levels solely onto parents, it has the potential to contribute to the stigma experienced by families with elevated levels. To minimise this and ensure messages have the maximum impact for the specific target groups they were developed for, any future messages or communication resources that are developed as part of the new TLAP stakeholder and partnership engagement program should be pre tested with different community demographic groups.

Creating a link from previous engagement campaigns to a new campaign will be important for the community to stay engaged and motivated. Previous campaigns reflected the importance of achieving blood lead reduction to ensure the community had a sustainable future; 'for the future we all want' has been the tag line in each campaign. The community is familiar with this future-looking tag line, and understands the link between reduced community blood lead levels and a sustainable future for the community, which is also reflected by the outcomes that will be delivered by TLAP and the Transformation.

The new campaign will include key messages that raise awareness and increased understanding of the goals, objectives and expectations of the different TLAP subgroups, and the

changes that will occur in the community as a result. It will be critical to continue to emphasise health messaging and a focus on children under the age of four, which is the focus of TLAP, but the messaging will also include elements that speak to the wider community about positive health and social outcomes and a sustainable future for the entire community. However, it will also consider the use of messages that do not focus specifically on 'lead', rather the focus will be broader regarding things the community can do to deliver a range of health and social benefits. TLAP will also consider adopting a 'social marketing' approach to assist in targeting its messaging.

#### **Recommended activities**

A Stakeholder Partnerships and Engagement Strategy that is focused on specific initiatives of the TLAP program will be developed to ensure key stakeholders are provided with key messages in a timely and coordinated manner, using effective communication tools. This strategy document will form part of the broader Transformation Communication and Engagement Strategy that is being prepared by the Communications Working Group of the PPTSC. However, key messages in relation to TLAP will remain the responsibility of TLAP.

As the communication needs of key stakeholders will vary and may change over time pending the implementation of TLAP and the Transformation, it is important to have some guiding principles that support a communication implementation structure.

The TLAP and Transformation communication strategy will include and reflect these guiding principles:

- Relevance: who are the stakeholders and what are their needs;
- Transparency: consistency of message;
- Inclusiveness: actively engage stakeholders;
- Accessibility: messages delivered in a timely manner;
- Integrity: professional and honest approach; and
- Cooperation: input from key stakeholders to develop and deliver messaging.

It is envisaged that the Stakeholder Partnerships and Engagement Strategy will be in place in early 2014 to ensure messaging supports the delivery of the Transformation announcement and the commencement of TLAP.

A Project Manager will oversee delivery of sub-program 5. Message identification and delivery will be achieved through consultation with other sub-program Managers, the TLAP Working Group and the Communications Working Group.

The ongoing engagement of key stakeholders of relevance to TLAP will continue under the existing engagement program through either the TLAP Working Group or the Communications Working Group.

One of the first tasks of the TLAP Committee post financial close is to undertake social profiling and interaction with key stakeholder groups through workshops, so as to inform the development of the Stakeholder Partnerships and Engagement Strategy.

## **5.6. Success measures**

TLAP will be unique in its approach, making it difficult to benchmark it against similar programs in Australia and overseas. The Working Group has identified the following measures. These measures may be adjusted following discussions with families of the target group and with service providers in the implementation phase.

### Ultimate success measures of effectiveness of TLAP

Increased voluntary enrolment in SA Health's lead abatement program with increased number of test results recorded.

Reduced number of children aged 0 to 4 years with blood lead levels exceeding 10 µg/dL. The statistical measures that SA Health will report on are:

- Proportion of children aged 0 to 4 years and pregnant women with blood lead levels below 10 µg/dL;
- Geometric mean blood lead level of children aged 0 to 4 years and pregnant women; and
- Geometric mean blood lead level of children aged 2 years.

### Program level, interim measures of success

The following can be used to measure if TLAP is delivering outputs as expected:

- Reduced disengagement from the program before a child reaches 3 years of age;
- Improved effectiveness of tracking individual family intervention by electronically linked blood lead screening results and exposure reduction actions;
- Revised Regional Public Health Plan for PPRC clearly identifies and implements legacy lead abatement issues and strategies for action;
- Measurable reduction in lead exposure in public spaces that are subject to a TLAP maintenance program; and
- Positive response to and acceptance of TLAP implementation measured via independent research with key community stakeholder groups.

The role of the TLAP Committee is to:

- (i) oversee the implementation of TLAP and its initiatives;
- (ii) monitor the effectiveness and delivery of individual initiatives and TLAP broadly against the success measures and TLAP objectives respectively;
- (iii) determine the form of a TLAP program from year to year, including in relation to budget;
- (iv) make decisions about adjustments to the program from time to time, including winding back initiatives, implementing new initiatives and funding of initiatives;
- (v) monitor the costs of implementing the TLAP program; and
- (vi) consider scientific and medical advancements and changes to standards related to blood lead levels, as related to lead emissions, human health and community blood lead levels and determine if adjustments to program delivery are required.