



# **BROKEN HILL ENVIRONMENTAL LEAD PROGRAM**

## **STEERING COMMITTEE ANNUAL REPORT 2016-2017**

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## CHAIRPERSON'S REPORT

It is my pleasure to present the Broken Hill Environmental Lead Program (BHELP) Steering Committee Report for the 2016-2017 financial year.

The report sets out the important steps the program has taken to manage and address the issue of lead exposure and ongoing detections of elevated blood lead levels in Broken Hill children aged 0 to 4 years of age.

The BHELP continues to take a multifaceted, integrated approach to tackling the lead issue under its three key priority areas - research and monitoring; remediation; and consultation, education and funding. This is especially important as the lead issue is a complex one in Broken Hill - there are multiple sources of lead exposure in our community. The lead we are exposed to can be from both historical and current mining operations and can be found on public land - such as parks and playgrounds - in workplaces, and in dust, dirt, soil, paint and other materials in and around our homes.

Our funding partnerships with the Far West Local Health District and Maari Ma Health Aboriginal Corporation (Maari Ma Health) have increased the capacity of these agencies to carry out more actions to prevent blood lead levels from becoming elevated and to case manage children with elevated blood lead levels.

Results from the blood lead screening programs to the end of 2016 showed a 16% increase in the number of Aboriginal children screened to 207 (the highest number to date), whilst the 480 non-Aboriginal children tested represented a decrease of 4% - in-line with the population reduction between 2015 and 2016. The geometric mean blood lead levels for all children remained stable when compared to 2015 - 5.8 µg/dL to 5.9 µg/dL. Aboriginal children improved significantly over this period, with a decrease in blood lead levels from 9.3 to 7.4 µg/dL - closing the gap between this result for non-Aboriginal and Aboriginal children to 2.4 µg/dL.

Funding from the BHELP has also allowed 189 assessments or visits to be undertaken in the homes of children with blood lead levels  $\geq 5$  µg/dL - these include advice and education on how to reduce lead exposure and the use of two portable XRF machines to identify possible sources of lead exposure contributing to elevated blood lead levels. From these assessments, 39 children - with blood lead levels  $\geq 15$  µg/dL and significant risks identified in the home environment - were referred to the BHELP home remediation program.

We continued to undertake research and evaluation to better understand lead risks and evaluate the effectiveness of control measures so that sustainable and cost-effective solutions to the local lead issue can be implemented.

Our collaboration with the Office of Environment and Heritage (OEH) has seen the installation of deposition and airborne dust gauges at five sites representative of lead exposure in Broken Hill. Samples from these gauges are collected on a rotational weekly basis and will help determine: the amount and source of the lead that is in the air and deposited in various locations across the city; the effectiveness of remediation projects undertaken by the program; and inform the development of lead abatement initiatives into the future.

During the year, we partnered with Dr Stephen Cattle and Sydney University to conduct two studies that have been integral for the program to target priority lead remediation solutions for the local community. This included a review of the long-term effectiveness of previous lead remediation

programs carried out in homes and other sites in Broken Hill, as well as a study to determine the risk of lead exposure at ten highly frequented public spaces – including parks, playgrounds and ovals.

The BHELP funded-study, led by the University Department of Rural Health (UDRH), investigating the risk factors and indicators of children developing elevated blood lead levels, reached its second phase during the reporting period. Findings from the first phase of the study suggest that lead exposure in the first year of life is likely to be a major indicator of how high a child's blood lead level will rise subsequently. Funding from the program has already supported the implementation of a number of new early intervention programs.

During the reporting period, 172 newborn families were provided with a LeadSmart information booklet at their 6-week universal home visit by a community nurse, and where intervention was required, they were referred to a Lead Health Education Officer. In addition, Lead Health Education Officers are now offering education packs and home visits to families and caregivers of six-month-old children – 169 LeadSmart education packs were distributed and 29 home assessments were accepted and undertaken during the year.

Routine sampling undertaken by the BHELP project team, as well as studies undertaken in collaboration with researchers and other professional bodies, identified areas of public land which pose a lead risk to the community. During the year, over 10 hectares of land including parks, playgrounds, ovals and other public spaces were remediated in partnership with Broken Hill City Council. This included Duke of Cornwall Park, AJ Keast Park and Alma Oval, and two large scale public land remediation programs in the vicinity of Block 10, the RSPCA and Old South Road and the completion of the University Dam / Willyama Common project.

Effective community engagement, including the implementation of awareness and education programs continued to be a key focus of the BHELP during the year. Stage one of the BHELP community engagement strategy, known as LeadSmart, was launched in November 2016 and ran until March 2017. The strategy included the development of a dedicated website - [www.leadsmart.nsw.gov.au](http://www.leadsmart.nsw.gov.au) - radio, TV and social media (Facebook) advertising, as well as story and colouring books, recipe cards and brochures. Evaluation of the strategy, through community and focus group surveys, showed that it was extremely effective in reaching and cutting through with the local community. Over 84% of those surveyed were exposed to campaign materials - with 77.5% of these people being able to remember three key LeadSmart tips or messages to reduce lead exposure. Most importantly, 46% of people surveyed claimed to have learnt something new, and are making behaviour changes in their life to reduce lead risks for themselves or others.

The BHELP will continue to work closely with key stakeholders and the local community to lead the NSW Government's response to the issue of lead exposure in Broken Hill. We remain focused on delivering programs which will result in greater community awareness and increased capacity of individuals to address the lead problem, and we will implement targeted, cost-effective and pragmatic solutions to mitigate risks associated with this environmental health issue - to provide better outcomes for local children and the Broken Hill community for generations to come.



**Marion Browne**

*Chairperson, Broken Hill Environmental Lead Program Steering Committee*

# ABOUT THE BROKEN HILL ENVIRONMENTAL LEAD PROGRAM

## Background

On 13 February 2015, the NSW Government allocated more than \$13 million, over the five years from 1 July 2015 to 30 June 2020, to address the issue of lead exposure in Broken Hill and ongoing detections of elevated blood lead levels in local children.

The funding established the Broken Hill Environmental Lead Program (BHELP), with an aim of developing sustainable solutions to ensure children aged 0-4 meet the National Health & Medical Research Council (NHMRC) guidelines for blood lead levels into the future. The program has a focus on Aboriginal children, given 78% currently have blood lead levels above the NHMRC benchmark of less than 5 micrograms of lead per decilitre of blood ( $\mu\text{g}/\text{dL}$ ).

On 19 May 2015, the NHMRC recommended that if a person has a blood lead level greater than five  $\mu\text{g}/\text{dL}$  of blood then the source of lead exposure should be investigated and reduced. The BHELP has adopted the NHMRC recommendations when addressing the issue of blood lead levels in local children.

## BHELP Steering Committee

The Steering Committee is the governing body charged with administration of the budget and overseeing the direction and strategic alignment of the BHELP with overarching funding principles.

The BHELP Steering Committee held its first meeting on 12 October 2015 - Marion Browne (Broken Hill Lead Reference Group Chairperson and a Broken Hill City Council Councillor) was appointed Chairperson at this meeting.

The Committee comprises two (2) representatives from the NSW EPA, two (2) representatives from NSW Health, two (2) representatives from the Broken Hill Lead Reference Group (BHLRG) and seven (7) representatives from the Aboriginal Lead Reference Group (ALRG) – 2 members of the ALRG attend meetings on a rotational basis.

## Committee members

Marion Browne – Chairperson, BHELP Steering Committee; Chairperson, BHLRG; Broken Hill City Council, Councillor

Ken Barnett – General Manager, Broken Hill Base Hospital

Bilyara Bates – ALRG; Project Officer, Aboriginal Affairs

Ann Bennett- ALRG; Aboriginal Health Practitioner, Maari Ma Health Aboriginal Corporation

Craig Bretherton – Manager Regional Operations South West, NSW EPA

Verina Crawford – ALRG; Clinical Leader, Aboriginal Mental Health Drug and Alcohol, Far West Local Health District

Cathy Dyer – BHLRG representative; Director of Corporate Services, Maari Ma Aboriginal Health Corporation

Jodielyn Edge – ALRG; Heritage Conservation Officer, Office of Environment and Heritage

Tegan Hinchey-Gerard – ALRG; Senior Project Officer, Aboriginal Affairs

Dr Therese Jones – Director, Population Health Western NSW & Far West Local Health District

Kaylene Kemp – ALRG; Manager Stakeholder Engagement, Maari Ma Health Aboriginal Corporation

Donnalee Kennedy – ALRG; Transition Worker, Initial Transition Service, Community Restorative Centre (CRC)

Professor David Lyle – Head of Department, Broken Hill University Department of Rural Health, University of Sydney

Jared Menz – ALRG (on a temporary basis as replacement for Tegan Hinchey-Gerard leave); Project Officer, Aboriginal Affairs

Gary Whytcross – Regional Director South & West, NSW EPA.

### Steering Committee meetings and member attendance

	12 September 2016	23 November 2016	15 March 2017	24 May 2017
<b>Marion Browne</b>	X	X	X	Apology
<b>Aboriginal Lead Reference Group – Kaylene Kemp, Ann Bennett, Tegan Hinchey-Gerard, Bilyara Bates, Donnalee Kennedy, Verina Crawford, JodieLyn Edge, Jared Menz</b>	X	X	X	X
<b>Ken Barnett</b>	Was not appointed on Committee until March	Was not appointed on Committee until March	X	X
<b>Craig Bretherton</b>	Apology	X	X	X
<b>Cathy Dyer</b>	X	X	X	X
<b>Dr Therese Jones</b>	X	X	Ceased appointment on Committee	Ceased appointment on Committee
<b>Professor David Lyle</b>	X	Apology	X	X
<b>Gary Whytcross</b>	X	X	X	X

### Aboriginal Lead Reference Group

The Group comprises seven (7) Aboriginal representatives from a broad range of backgrounds in the local community. The ALRG is an important stakeholder consultation tool, providing two-way conversation between BHELP and the local Aboriginal community – who are over-represented when it comes to incidences of high blood lead levels.

### BHELP project team

The BHELP project team works closely with key stakeholders and the local community to coordinate the work priorities of the BHELP under three key focus areas:

#### Research and monitoring

- Review previous lead strategies at Broken Hill
- Identify remediation priorities
- Identify contamination and re-contamination processes and sources
- Research and develop best practice in lead abatement
- Plan an abatement program that can be carried out systematically based on existing data and the potential for exposure for young children across Broken Hill
- Develop cost effective methods for abating lead risks within homes and areas where children congregate such as at preschools and playgrounds

- Develop a modern interventions education and awareness program (eg home hygiene for children with very high blood lead levels) to assist to reduce high blood lead levels when they are detected.

### **Consultation, education and funding**

- Enhance existing services and programs provided by the Far West Local Health District (FWLHD) and Maari Ma Health by supporting the existing blood lead level testing program with a particular emphasis on engaging with groups that may have been under-represented in previous testing programs
- Provide on-going education and advisory role through schools, local media, local health service providers, and local Aboriginal community support groups
- Identify children with high blood lead levels and look to include these in a program to assess sources and pathways or lead exposure within homes
- Engage with BHLRG to identify priority areas/issues
- Engage with owners of contaminated land (private and government) to identify priority areas/issues
- Initiate active public education programs and community engagement campaigns, with a focus on establishing adequate lead hygiene standards within the community
- Prepare applications for external funding.

### **Remediation**

The project team will co-ordinate the implementation of on-ground remediation of sites in priority order, developed from:

- the research and monitoring stage of the program
- priorities and issues identified by the BHLRG and BHELP Steering Committee
- priorities and issues identified during key stakeholder and community engagement.

### **Staff and responsibilities**

The NSW EPA manages the administrative functions of the BHELP project team. The BHELP team has five (5) full time staff based in Broken Hill.

- Project Manager – oversees the team and overall project management, reports to BHLRG and the BHELP Steering Committee
- Technical Officer – undertakes on the ground assessment work of lead contaminated lands, provide technical input to the priority areas for remediation

- Senior Community Engagement Officer – engages with the local community and key stakeholders on lead issues via communications and education programs
- Aboriginal Liaison Officer (identified position) – provides a linkage into the local Aboriginal community, to liaise with families of high risk children, to ensure high risk groups are identified and encouraged to participate in the program
- Administration Officer – provides administrative support to the team
- BHELP also supports the employment of an Aboriginal Environmental Health Trainee – hosted by the Western NSW Local Health District, NSW Health Aboriginal Environmental Health Unit and BHELP.

### **Broken Hill Lead Reference Group**

The Broken Hill Lead Reference Group (BHLRG) - facilitated by the Broken Hill City Council (BHCC) - is an important community consultation tool, providing guidance and feedback to BHELP through its meetings and the BHLRG Integrated Strategy.

The BHLRG meets at least quarterly – prior to the Steering Committee Meeting - and the BHELP project manager provides regular reports to the group on program progress and gathers invaluable feedback for the strategic direction of key projects.

## SUMMARY BUDGET

The following table has been reviewed by the Committee, which is of the opinion it provides an accurate overview of program performance against budget objectives for the reporting period. For a detailed budget statement see attachment one.

<b><u>BHELP PROGRAM</u></b>	<b><u>TOTAL EXPENDITURE AS AT 30 JUNE 2017 (\$)</u></b>
<b>BHELP Operations</b>	\$770 905
<b>Communication &amp; Engagement</b>	\$176 955
<b>Aboriginal Children</b>	\$250 000
<b>FWLHD</b>	\$250 000
<b>Research and Monitoring</b>	\$166 740
<b>Clean Up / Remediation</b>	\$737 300
<b><u>TOTAL</u></b>	<b>\$2 351 900</b>
<b><u>TOTAL BUDGET</u></b>	<b>\$2 400 000</b>
<b><u>NET RESULT</u></b>	<b>\$48 100 – carried over to 2017-2018 budget</b>

## SUMMARY OF BHELP ACTIVITIES AND PERFORMANCE

### Research of lead contamination at public parks and ovals

During the reporting period, Associate Professor Stephen Cattle and his team at Sydney University were engaged to assess the topsoil and ground cover lead contamination at ten public parks and ovals.

The ten parks and ovals assessed as part of this project included:

- (1) Duke of Cornwall Park
- (2) Patton St Park
- (3) Alma Oval
- (4) Kintore Reserve
- (5) Sturt Park
- (6) North Family Play Centre
- (7) Picton Sports Ground
- (8) O'Neil Park
- (9) Memorial Oval
- (10) Jubilee Oval.

The research found that generally the parks and ovals furthest from the Line of Lode and mining works have the lowest topsoil lead concentrations, while those closer to the Line of Lode tend to have at least some small sections with topsoil lead concentrations higher than the Health Investigation Limit (HIL) for public recreational spaces.

In addition, those sections of parks with well-maintained grass, turf or other coverage or those that had been recently remediated through the program, generally contained low concentrations of lead, while sections of exposed soil or patchy exposed soil in public spaces close to the Line of Lode tend to exhibit topsoil lead concentrations that exceed the HIL for public recreational spaces.

The results of this study were used to prioritise remediation efforts of the program according to risk for public exposure.

### Audit of previously remediated sites

The findings of Associate Professor Stephen Cattle's study into the long-term effectiveness of previous remediation programs in Broken Hill were made available during the reporting period.

In mid-September 2016, Professor Cattle and his team sampled randomly selected sites - including private backyards, vacant blocks, footpaths, nature strips and other public spaces – and compared current soil lead levels to those prior to previous remediation works to assess abatement or remediation strategies that are most effective.

A variety of remediation strategies were used in the previous program, including excavation and/or topdressing of existing soil with clean garden loam, cracker dust, wood chips, road base, gravel/pebbles and coarse sand. There was not a strong correlation of abatement strategy with lead

concentration mainly due to factors such as residents' preferred usage of the yards and preferences for abatement materials.

The results indicated that the previous remediation program has been broadly successful - the topsoil lead concentrations of the previously abated surfaces were significantly less than concentrations prior to abatement, and no particular abatement strategy was found to be significantly more effective than the others.

Although many previously-abated surfaces are still keeping surface lead concentrations low, others showed signs of 'wear and tear', and more than half of the surfaces had lead concentrations that suggest some degree of re-contamination and were prioritized by the BHELP on a risk based scale for remediation.



*Previously-remediated residences and public access areas re-assessed for topsoil lead concentrations (Associate Professor Stephen Cattle, University of Sydney, 2016)*

### Public lands remediation projects

The results of the above studies, along with additional research undertaken by partner academics, and routine sampling of public spaces and playground equipment, were used to identify priority areas of public land in need of remediation and the strategy to be implemented as the most effective means to eliminate risks.

As part of the BHELP's commitment to reduce the risk of lead exposure in public spaces the following projects were planned, commenced or completed during the reporting period through existing partnerships with organisations such as BHCC, NSW Public Works and other contractors.

### AJ Keast Park

BHCC installed fencing to restrict public access to areas identified with high lead levels. In addition, storm water drainage lines were contoured and rock armoured and equipment containing lead based paint was removed.



*A fence was erected to restrict public access to area at rear of the park with identified high lead levels.*

### Alma Oval

Areas identified with high lead content were excavated and covered with cement-stabilised road base.



*Prior to remediation: Bare dirt area with identified high lead levels.*



*After remediation: cement-stabilised road base covers excavated area.*

### Patton Park

As part of the BHCC Patton Park revitalisation project, the following lead remediation or abatement works are planned to commence during the next reporting period: the installation of a roof structure over the new playground equipment; installation of handwashing facilities and LeadSmart signage within the playground enclosure; and the installation of a high-pressure hose for routine washing of playground equipment.

### Lamb Oval

A study by Macquarie University students in 2016 identified bare areas of soil surrounding the oval where the public and children gather during the rugby league season. In partnership with the Broken

Hill City Council, budget has been allocated to commence works during the 2017-2018 reporting period.

### Block 10

Over four hectares of public land were remediated in the areas of Block 10 flat, Old South Rd and the RSPCA triangle in partnership with NSW Public Works and Broken Hill City Council. The project included earthworks and excavation, mulching, covering with road base, ballast lining of stormwater drainage lines and rock armoring of excavated land - to create a barrier over lead impacted soils. Works were carried out in this area as part of the previous lead program in the 1990's, however recent studies by the University of Sydney (Audit of Previous Remediation Programs) and Macquarie University identified additional works were required.

### University Dam

As part of a Memorandum of Understanding (MoU) with BHCC over five hectares of public land were remediated on the Willyama Common in the University Dam area behind Robinson College.

During the year, the earthworks components of the project were completed and a security fence was installed around the perimeter of the area to limit public accessibility. The works included excavation and the covering of bare soil with three layers – limestone, loam and mulch –, rock armoring of storm water drainage lines and reshaping works.

Local mining company Perilya Broken Hill Limited also limestone-capped bare areas on their lease that is located adjacent to the site.

The final component of the project – regeneration of the area through planting and seeding – will be implemented during the 2017-2018 financial year.



*Aerial view of area remediated at University Dam.*



*Limestone, loam and mulch were used to cover areas of bare soil following excavation works.*

## Mapping of contemporary blood lead levels

Once complete this study will map the distribution of lead levels in soil, blood and dust to facilitate the identification of high lead risk areas - areas of contaminated (soil, dust, dirt) or individual residences associated with repeated elevated blood lead levels.

The study progressed during the reporting period, with data cleansing of around 20,000 paper and electronic based records.

A major milestone achieved during the year was the successful negotiation and approval of a data sharing agreement with the various stakeholders or data owners contributing to this project.

The final layers of data have now been loaded into the mapping software and rigorous testing and enhancement is now being undertaken to ensure data integrity.

### Contemporary dust analysis project

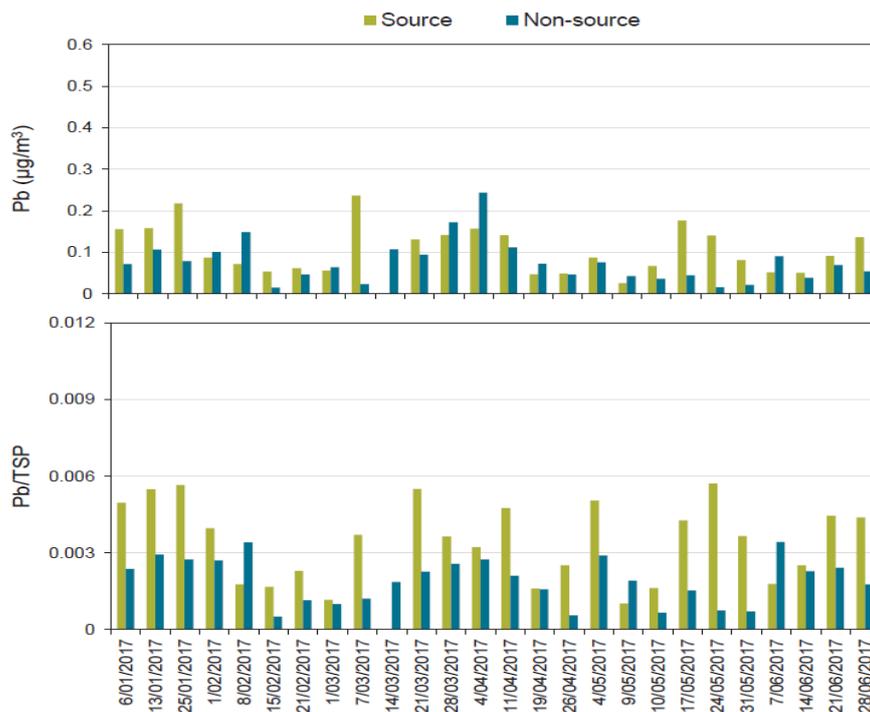
The Broken Hill Environmental Lead Study (BHELS) project plan was established during the reporting period to provide strategic direction for the monitoring of airborne and deposited lead.

The project aims to assess the amount and source of lead that is in the air and deposited at various locations across the city. For example, it will determine what the current contribution of emissions from the Line of Lode and mining leases are to dust and blood lead levels compared to historical contributions or 'legacy lead'.

Data collection and sampling commenced in August 2016, using wind directional high-volume air gauges installed at five sites representative of community exposure to lead in Broken Hill. To build on the existing airborne lead sampling, dust deposition gauges were installed at four of the existing sampling sites, with an additional site due for installation in late 2017.

To support this project, Macquarie University were engaged to undertake a pilot study to investigate the usefulness of microscopy techniques to characterise the size and shape of airborne particles collected to identify the source of lead.

The first year results of the airborne and deposited lead will be released in early 2018. Findings from the three-year project will help direct future efforts to reduce community lead exposure in Broken Hill and assess the effectiveness of remediation programs implemented throughout the program.



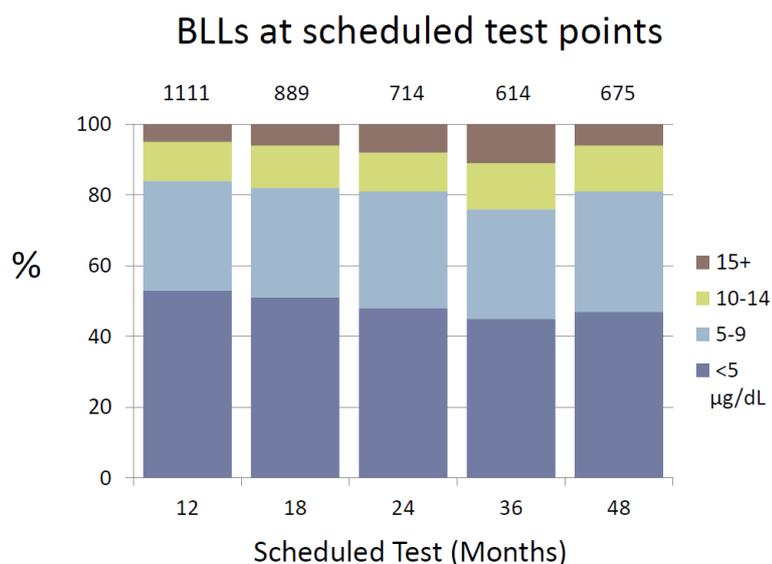
Site averages for January to June 2017 (Climate and Atmospheric Science Branch, NSW Office of Environment and Heritage, Sydney NSW).

## Indicators and risk factors for developing elevated blood lead levels

Phase one of the research project to determine the indicators and risk factors associated with elevated blood lead levels was completed during the year in partnership with the (FWLHD) and Broken Hill University Department of Rural Health (UDRH).

As part of phase one, data was collected from the Lead Management Program database on all eligible children who had a blood lead screening test between October 2009 and December 2016. Data included, address, birth date, sex, test date and blood lead result. A subset of children who had tests during each of the 12, 24 and 36 month scheduled testing windows were also analysed to determine the proportion of children whose blood lead levels remain below 5 µg/dL. For these analyses, addresses were additionally classified into five risk areas ('1' highest to '5' lowest) based on lead levels in soil, dust and blood.

The study found most of the increase in blood lead levels that occurred over the first two years of life had already occurred by 12 months. Almost half of the children presenting for the scheduled 12 month test already had a blood lead level  $\geq 5$  µg/dL. Furthermore, the proportion of children with blood lead levels  $\geq 5$  µg/dL at subsequent scheduled tests (18 months, 2, 3 and 4 years) did not differ greatly from the 12-month test. This suggests that lead exposure in the first year of life is likely to be a major determinant of how high a child's blood lead level will rise subsequently.



*Blood lead levels (BLLs) among Broken Hill children born 2009-2015 (Broken Hill UDRH, 2016).*

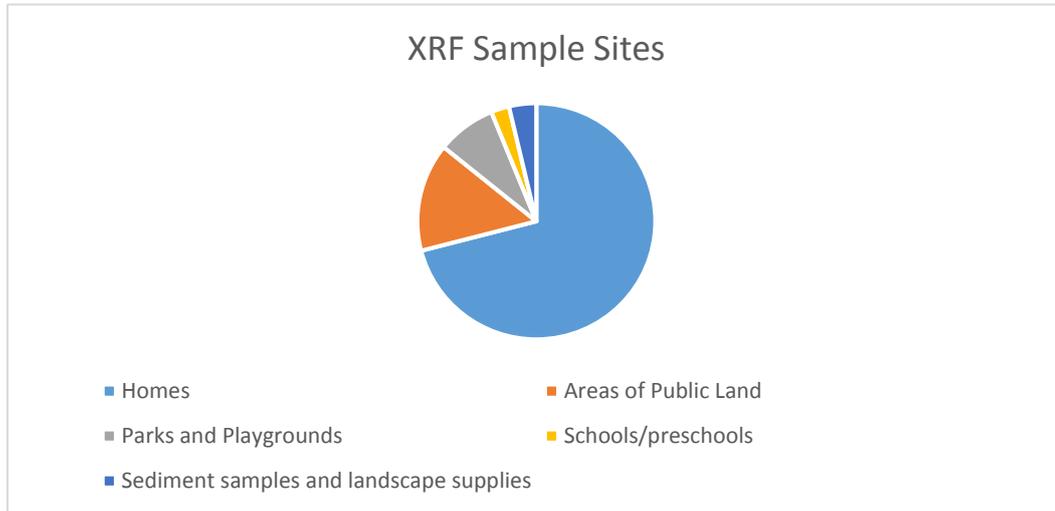
## Routine sampling, testing and assessment

Two portable X-Ray Fluorescence (XRF) are routinely used by the BHELP team, the FWLHD Child & Family Health team and Maari Ma Health to immediately analyse lead levels in soil, dust and paint and identify high risk lead areas that require remediation.

In addition to the home assessments undertaken by Child & Family Health and Maari Ma Health, the BHELP team regularly uses the XRF to undertake routine sampling at playgrounds, preschools, schools, family daycare homes and areas of vacant land. The machine is also used to test landscaping and garden products at local distributors and sediment collected by Council street sweepers.

The BHELP team also regularly tests lead levels on playground equipment at local parks through simulated play activities, whereby the transfer of lead dust onto hands is sampled using wet wipes.

During the reporting period a total of 446 paint readings, 3,217 soil samples and 162 sites were assessed using the XRF machines.



### LeadSmart Community Engagement Strategy

Public education and awareness programs are a key focus area of the Broken Hill Environmental Lead Program (BHELP) strategy to address the lead issue in Broken Hill.

The LeadSmart stage one community engagement strategy was launched in November 2016 by the Hon. Kevin Humphries MP and ran until March 2017.

The campaign consisted of a dedicated website, radio, TV and social media (Facebook) advertising, as well as story and colouring books, recipe cards, brochures and fact sheets. The campaign featured many familiar faces from the Broken Hill community offering simple advice on how to reduce lead exposure.

In addition, brochure stands and posters were distributed to 57 touchpoints across the community including schools, preschools, health service providers, local and state government offices and community groups.

Evaluation of the stage one LeadSmart campaign - through community surveys and data analysis - has shown that it was extremely effective in cutting through with all key target audience groups.

Campaign materials were overwhelmingly viewed as being appealing, easily understood, relevant, believable, and motivational. In addition, they positively influenced awareness and conversation on the lead issue and on how locals can reduce lead exposure.

Among the 85% of those surveyed who were reached or exposed to the paid advertising components of the campaign, over 43% claimed to have seen campaign elements at least three times a week or more (daily) and over 46% had learnt something new as a result of seeing it.

Additionally, message recall was extremely high with 77.5% of those surveyed able to remember three (3) or more key tips or messages from the advertising materials.

Most importantly, the campaign had the ability to influence behaviour modifications with 46% of people indicating that they had made positive changes in their life to reduce lead exposure for themselves or others.

At its meeting on 24 May 2017, the BHELP Steering Committee approved the key focus areas of the stage two LeadSmart strategy and the commencement of procurement processes to engage specialist contractors to deliver the strategy.

The strategy will include the development and delivery of targeted education programs to key audience groups such as preschool and primary students, parents, teachers, tradespeople and local and state Government workers. The objective of the strategy is to change behaviours, build capacity and empower so that individuals - and through the individual the broader community - have the skills and confidence to address the lead issue into the future.



Wash and dry your hands well after playing outside.

## Engaging with the community through events, promotions and forums.

The following is a list of the activities undertaken throughout the community and to targeted groups to raise awareness of the lead issue and educate on how to reduce lead exposure risks.

- During December 2016, three education workshops were facilitated at the 123 Community Hub in Creedon Street. The pilot program included discussions and practical activities - such as preparation of food from the LeadSmart recipe book and demonstrations on handwashing. The sessions were targeted to build meaningful relationships with the local Aboriginal community and engage with families that quite often don't have the capacity to manage lead exposure risks. A total of 32 children and 27 adults attended over the three day pilot - these included not only residents in the area, but also families from the North of the city, some transient families and a young mum who had just moved to the city from Central NSW. Overall the sessions were well received and will assist in the development of quality, targeted education and engagement strategies in the future.



*Children loved meeting Lead Ted Jnr at NAIDOC Day celebrations 2017.*

- LeadSmart community promotions for NAIDOC day, National Children's Day at the Sturt Park and International Lead Poisoning Prevention Week of Action at the Westside Plaza in October 2016.
- Participated in the 2016 BHCC Xmas Pageant with a LeadSmart float entry and distributed LeadSmart colouring books and other promotional materials to the public in attendance.
- Presented at 6 community groups and forums to give an overview of the program, the key focus areas and raise awareness of the lead issue.
- Following a significant hailstorm in November 2016, a number of local and temporary (out of town) roofing contractors were engaged to undertake insurance work on damaged property. An education program was conducted in February 2017 targeting roofing contractors, with a focus on lead dust in ceiling spaces and how to reduce the potential hazards to home occupiers and installers.
- Participated in the Country & Outback Rugby League Primary Schools Gala Day in March. The BHELP assisted on the day with a LeadSmart marquee, offered LeadSmart information and a handwashing station and engaged with the Aboriginal and wider community on the lead issue.



*Engaging with the community at the 2017 Outback Rugby League Primary Schools Gala Day.*

## Memorandums of Understanding with Maari Ma Health and Far West Local Health District

The ongoing MoU with the FWLHD and Maari Ma Health continued to enhance existing blood lead testing and monitoring programs and have allowed additional early intervention, home assessment, education and remediation programs to be implemented.

### A snapshot of the achievements of the funding partnerships during 2016-2017:

- Employment of two Indigenous field officers engaging with Maari Ma Health families on lead
- Employment of an additional officer to the existing Lead Health Education Officer team of two at Child & Family Health
- 16 per cent increase in the number of Aboriginal children tested – from 178 in 2015 to 207 in 2016
- 189 home visits or environmental assessments were undertaken during the year. These are now offered to all children with Blood Lead Levels  $\geq 5 \mu\text{g/dL}$ . These include general education and advice on how to reduce lead exposure and the use of a portable XRF to immediately analyse lead levels in paint, soil and dust to identify sources of lead exposure and mitigate lead risks



*A Child & Family Health lead health education officer undertakes an environmental home assessment using the XRF machine.*

- 39 children with BLL  $\geq 15 \mu\text{g/dL}$  and significant risks identified in the home environment were referred to the BHELP home remediation program
- Support for families of children with elevated blood lead levels including transport, temporary housing relocation, nutritional supplements
- Practical incentives to encourage testing, home assessments and to minimise lead exposure such as cleaning and renovation kits and sandpits
- 172 newborn families were provided with a LeadSmart information booklet at their 6 week universal home visit by a community nurse, and where intervention was required, they were referred to a Lead Health Education Officer
- Lead Health Education Officers are now offering education packs and home visits to families and caregivers of six month old children – 169 LeadSmart education packs were distributed and 29 home assessments were accepted and undertaken during the year

- Lead Health Education Officers continued the Lead Ted Jnr education or incursion program in local schools and preschools
- Lead Health Education Officers facilitated LeadSmart education sessions with maternity and paediatric staff at FWLHD.



*Lead Ted Jnr and a Lead Health Education Officer attend Central Preschool to teach the children how they can be LeadSmart.*

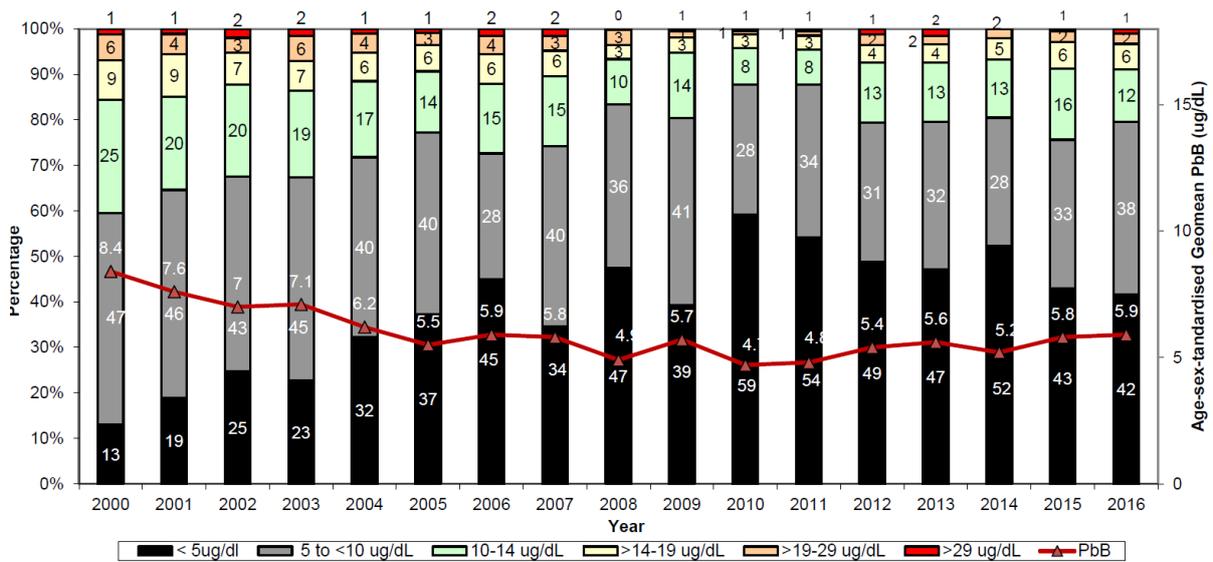
## Blood Lead Report

The FWLHD in partnership with Broken Hill UDRH and Western NSW Health Intelligence Unit releases an annual calendar year report on the voluntary blood lead data obtained through lead monitoring and screening services at the FWLHD and Maari Ma Health.

The following is a summary of the results for the 2016 calendar year:

1. Total number of children tested – 679 in 2015, 687 in 2016
  - 16 per cent increase in Aboriginal children tested – 178 in 2015 to 207 in 2016. This is the highest number of Aboriginal children screened to date.
2. Age-sex standardised mean for all children tested – 5.8 in 2015, 5.9 in 2016
  - Significant improvements in Aboriginal children – 9.3 in 2015 to 7.4 in 2016.
3. Proportion of all children below the National Health & Medical Research Council Guideline level of 5 for investigation – 43% in 2015, 42% in 2016
  - Aboriginal and non-Aboriginal – 22% compared to 50% respectively
  - Improvements in Aboriginal children – 17% in 2015, 22% in 2016.
4. Umbilical cord results – calculated mean of 1.1 in 2015, 0.84 in 2016.

Percentage of children aged 1 – 4 years in Broken Hill by category of blood lead level and age-sex-standardised geomean by year



Broken Hill Blood Lead Report 2016: children less than 5 years old, Revised 2016 Census (Broken Hill UDRH, FWLHD, Western NSW Health Intelligence Unit, September 2017).

Annual comparison in the age-sex standardised mean is not a useful indicator for evaluating the effects of some of the key programs implemented by the BHELP. The effects of remediation and education on blood lead levels accumulate over time and are likely to have minimal short-term effect on children who already have elevated blood lead levels.

Useful key performance indicators to measure the effectiveness of programs undertaken by the BHELP into the future include:

- Longitudinal analysis or trends in blood lead levels for individual children coming into the 1-4 years target groups
- Longitudinal analysis of the percentage of children within each of the six categories or bands of blood lead level – with a view of decreasing the percentage of children in the higher bands and increasing the percentage or shifting the number of children into the lower bands
- Process measures, including: number of home assessments; number of properties remediated; total area of land remediated; attendance at presentations and community events; reach and engagement of health promotion and education activities; trends in lead levels in air.

### MoU with Broken Hill City Council

The BHELP continued its formal partnership with the BHCC, with a MoU outlining a number of lead remediation projects from April 2016 to June 2020 in accordance with an annual work plan.

The annual work plan has been developed on a priority or risk based system – focusing on projects identified by the BHELP Steering Committee requiring remediation to effectively manage exposure to lead on public sites / land.

The following projects were undertaken during the reporting period and were aimed at managing and minimising exposure to lead in the local environment and addressing blood lead levels, particularly in children. These include:

Joint co-ordination of the management of lead contaminated public land and spaces.

- The lead remediation projects planned, commenced or completed during the financial year in partnership with Council include: 5 hectares of public land were remediated in the area of University Dam on the Willyama Common; 5 hectares of public land was remediated in the vicinity of Block 10, Old South Road and the RSPCA; AJ Keast Park; Lamb Oval; and Patton Street Park
- During the reporting period, BHCC conducted a public sale of land to recover unpaid rates. Nine of these blocks were identified by BHELP as high risk lead areas. These were retained by Council following the auction and have been monitored and remediated where required. Council and BHELP staff inspected each of the blocks and identified works that were required for each of the blocks.

#### Ongoing annual maintenance of Council parks and playground equipment.

- High pressure cleaning of playground equipment and surrounding surfaces continued weekly at Sturt, AJ Keast and Duff Street Park
- Facilities and signage were regularly inspected and maintained at Duff, Sturt, Duke of Cornwall and AJ Keast Parks to ensure that children are able to wash their hands after playing and before eating
- Bare surfaces at local parks and playgrounds were tested regularly for lead levels and were remediated where necessary.

#### Street sweeper

- BHELP funding saw a newly purchased street sweeper fitted with an additional dust control microspray system – to keep lead dust generated by sweeping activities to a minimum and to avoid recontamination of previously lead remediated sites
- Funding continued to be used to increase the street sweeping schedule, giving priority to local streets with known high lead levels in storm water sediment /runoff.



*A BHCC street sweeper fitted was fitted with an extra dust control microspray system.*

#### **Home remediation program**

The home remediation program is targeted at those children with confirmed blood lead levels above 15 µg/dL, where significant lead risks are identified by Maari Ma Health and FWLHD Child & Family Health case managers during home assessments. These additional risks includes soil lead levels ≥1,000 parts per million, unstable lead based paint, and poorly sealed cornices with evident dust trails from the ceiling.

Following the completion of the pilot home remediation program in 2015-2016, an additional 39 homes were assessed and scheduled for remediation works.

Remediation was carried out by NSW Public Works in consultation with case managers at the FWLHD Child & Family Health team and Maari Ma Health. The work included best-practice methods of minimising the lead hazard and were customised, in consultation with the family, based on known

lead risks in the home - including covering soil, stabilising or removing unstable lead based paint, sealing cornices with flexible sealant and cleaning of carpets and soft furnishings.

## ATTACHMENT ONE – DETAILED BUDGET 2016-2017

<u>PROGRAM</u>	<u>TOTAL EXPENDITURE AS AT 30 JUNE 2017 (\$)</u>	<u>EXPENDITURE 2016 2017 (\$)</u>
<b>BHELP Operations</b>	\$770 905	<p><u>\$ 701 990 Salaries</u></p> <ul style="list-style-type: none"> <li>• Project Manager</li> <li>• Technical Officer</li> <li>• Senior Community Engagement Officer</li> <li>• Aboriginal Liaison Officer</li> <li>• Administration Officer</li> <li>• Aboriginal Environmental Health Trainee.</li> </ul> <p><u>\$68 915 General operational expenditure</u></p> <ul style="list-style-type: none"> <li>• Office space, equipment and consumables</li> <li>• Communications and information technology</li> <li>• Postage, courier and freight.</li> </ul>
<b>Communication &amp; Engagement</b>	\$176 955	<p><u>\$158 110 LeadSmart stage one community engagement strategy</u></p> <ul style="list-style-type: none"> <li>• Two Facebook social media campaigns - creation of assets, media buy, digital upload and monitoring</li> <li>• Radio - media scheduling, buy, creative despatch, adserving, monitoring, voiceovers</li> <li>• Television - media scheduling, creative despatch, adserving, monitoring, closed captions and free TV classification.</li> </ul> <p><u>\$18 845 General communications and engagement expenditure</u></p> <ul style="list-style-type: none"> <li>• Printing</li> <li>• Community events and promotions</li> <li>• <a href="http://www.leadsmart.nsw.gov.au">www.leadsmart.nsw.gov.au</a> - Website hosting and maintenance.</li> </ul>
<b>Indigenous Children</b>	\$250 000	<p><u>\$250 000 Maari Ma Health Aboriginal Corporation provision of specific monitoring and services for Aboriginal children.</u></p>

		<ul style="list-style-type: none"> <li>• Employment of two Lead Field Officers to engage with Maari Ma Health children and families</li> <li>• Blood lead testing / monitoring of Aboriginal children in line with agreed testing schedule and blood lead management guidelines by appropriately qualified staff</li> <li>• Home assessment and education program for all children with blood lead levels <math>\geq 5\mu\text{g/dL}</math>. In home education and the assessment of a child's primary home environment is undertaken, including a visual assessment of house and yard and testing via XRF to identify sources of lead exposure.</li> <li>• Medical supplies relating to blood lead screening</li> <li>• Lead health education and incentive activities</li> <li>• Home remediation program.</li> </ul>
<p><b>FWLHD</b></p>	<p>\$250 000</p>	<p><u>\$250 000 Child &amp; Family Health augment existing monitoring &amp; services.</u></p> <ul style="list-style-type: none"> <li>• Employment of Lead Health Education Officer to undertake monitoring, home visits, environmental assessments and education programs.</li> <li>• Blood lead testing / monitoring of children in line with agreed testing schedule and blood lead management guidelines by appropriately qualified staff</li> <li>• Home assessment and education program for all children with blood lead levels <math>\geq 5\mu\text{g/dL}</math>. In home education and the assessment of a child's primary home environment is undertaken, including a visual assessment of house and yard and testing via XRF to identify sources of lead exposure.</li> <li>• Cord blood and venous testing verification</li> <li>• Home remediation program</li> </ul>

		<ul style="list-style-type: none"> <li>• Early intervention program</li> <li>• Lead health education and incentive activities.</li> </ul>
<b>Research and Monitoring</b>	\$166 740	<p><u>\$19 960 University of Sydney Public Parks Research Study</u></p> <ul style="list-style-type: none"> <li>• Design and implement study</li> <li>• Conduct sampling at 10 public parks, playgrounds and ovals</li> <li>• Provide project report, including assessment of lead levels and risk ratings.</li> </ul> <p><u>\$28 690 Canopy Enterprises Broken Hill Rail Corridor Assessment</u></p> <ul style="list-style-type: none"> <li>• Research into operations and previous remediation works along rail corridor</li> <li>• Design and implement study</li> <li>• Conduct sampling of agreed areas along rail corridor</li> <li>• Provide project report, including assessment of lead levels along rail corridor.</li> </ul> <p><u>\$29 370 University of SA Bioavailability of lead in soils research project</u></p> <ul style="list-style-type: none"> <li>• Design study</li> <li>• Soil sample collection and characterisation</li> <li>• Laboratory assessment of lead relative bioavailability and lead bio accessibility using samples collected in field</li> <li>• Assessment of relationship between bioavailability and bio accessibility</li> <li>• Provide project report.</li> </ul> <p><u>\$47 140 Office of Environment &amp; Heritage, Climate &amp; Atmospheric Science Contemporary Dust Study</u></p> <ul style="list-style-type: none"> <li>• Ongoing three-year study to determine the contribution of current dust emissions from the Line of Lode and mining leases, compared with historic emissions ('legacy lead') to existing lead levels in dust and children's blood.</li> </ul>

		<ul style="list-style-type: none"> <li>• Establishment of Broken Hill Environmental Lead Study (BHELS) project plan and group</li> <li>• Purchase and installation of high volume dust deposition gauges at existing sites across Broken Hill.</li> </ul> <p><u>\$41 580 Purchase of portable XRF analyser Maari Ma Health</u></p> <ul style="list-style-type: none"> <li>• Purchase of handheld device that instantaneously detects lead levels in dust, dirt soil and paint.</li> </ul>
<b>Clean Up / Remediation</b>	\$737 300	\$22 000 Block 10 Flat remediation project \$23 300 Alma Oval remediation project \$250 000 Old South Rd remediation project \$142 000 Public Parks remediation projects \$300 000 Broken Hill City Council public spaces remediation projects
<b><u>TOTAL</u></b>	<b>\$2 351 900</b>	<b>\$2 351 900</b>
<b><u>TOTAL BUDGET</u></b>	<b>\$2 400 000</b>	<b>\$2 400 000</b>
<b><u>NET RESULT</u></b>	<b>\$48 100 – carried over to 2017-2018 budget</b>	<b>\$48 100 – carried over to 2017-2018 budget</b>