



# **BROKEN HILL ENVIRONMENTAL LEAD PROGRAM**

## **STEERING COMMITTEE ANNUAL REPORT 2017-2018**

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## CHAIRPERSON'S REPORT

I am pleased to present the Broken Hill Environmental Lead Program (BHELP) Steering Committee Annual Report for the 2017-2018 reporting period.

The report presents highlights from a productive year in which the BHELP worked with government, local businesses, industry, professional bodies, health service providers, and the community to address significant health and exposure issues resulting from the problem of environmental lead contamination in the Broken Hill community.

During the year, the BHELP continued to manage the local lead issue using a complex mix of community-based programs focussed on: keeping the local community informed about the lead issue and what can be done to minimise its impact on health; the enhancement and extension of existing monitoring programs, including early intervention and case management for kids with elevated blood lead levels; remediation programs in an effort to create safer home environments for at risk children and safer public lands for the entire community; and ongoing research and monitoring. These activities aim to continuously enhance the ability of the Broken Hill community to sustainably deal with the issue and minimise the risk of young children under 5 years of age developing elevated blood lead levels into the future.

It is pleasing to report that results contained in the 2017 Blood Lead Report cement the success of programs delivered by the BHELP, particularly the ongoing funding of lead health services offered by Maari Ma Health Aboriginal Corporation and Far West Local Health District (FWLHD), Child & Family Health under Memorandums of Understanding (MOUs). This has allowed them to carry out more actions to prevent blood lead levels from becoming elevated, through the expansion of the existing blood lead screening and monitoring programs and the implementation of targeted education, early intervention, case management and remediation programs. The 2017 report found:

- The proportion of children with blood lead levels below the notifiable level of 5.0 ug/dL increased from 42% to 46% from 2016 to 2017.
- 730 children were screened (an increase of 6% from 2016) which included 221 Aboriginal and 509 non-Aboriginal children.
- The 221 Aboriginal children tested represented an increase of 6.8% (from 207) and the highest number screened on record. The 509 non-Aboriginal children tested also represented an increase of 6.0% (from 480).
- The geometric lead mean level (age-sex standardized) for all children (1 to < 5 years) decreased from 5.9 ug/dL in 2016 to 5.7 ug/dL in 2017.
- The mean result for non-Aboriginal children decreased, from 5.2 in 2016 to 4.6 µg/dL– the lowest on record.
- The 2017 results show 58% of non-Aboriginal children in Broken Hill had a blood lead level below 5 µg/dL, compared to only 22% of Aboriginal children. The result for Aboriginal children remained the same as 2016 (22%), whilst the result for non-Aboriginal children improved in the same period, increasing from 50% to 58%.
- The percentage of all children with blood lead levels above the notifiable level of 5 has decreased – from 58% in 2016 to 54% in 2017.

The expansion of the blood lead screening programs offered by Child & Family Health and Maari Ma Health Aboriginal Corporation has meant that blood lead tests are now offered at 6, 9 and 18 months in addition to the pre-existing monitoring at 12 months, 2 years, 3 years and 4 years. This

means that earlier interventions can be undertaken where necessary when children present with elevated blood lead levels and has resulted in a better understanding of the burden of lead levels among Aboriginal and non-Aboriginal children.

In addition, over 210 home visits or environmental home assessments were undertaken during the year in the homes of all children with blood lead levels  $\geq 5 \mu\text{g}/\text{dL}$ . These included general education and advice on how to reduce lead exposure and the use of two X-Ray Fluorescence (XRF) machines to immediately analyse lead levels in paint, soil and dust to identify sources of lead exposure and mitigate lead risks. Children with blood lead levels  $\geq 15 \mu\text{g}/\text{dL}$  and significant risks identified in the home environment were referred to the BHELP home remediation program.

Maari Ma Health Aboriginal Corporation and Child and Family Health staff continued to provide education materials and advice at the time of testing to all children, and additionally were able to offer supporting resources such as gardening and cleaning packs and sandpits to all families. Over 100 sandpits were delivered to families of Aboriginal children during the year and approximately 200 sandpits to non-Aboriginal children - to provide a LeadSmart play area for children in their home environment.

As an extension of existing services, all six-month-old children were provided with an education pack and offered a home visit at their scheduled lead test – regardless of their blood lead levels. During the reporting period, 162 LeadSmart education packs were distributed and 20 home visits were accepted and undertaken in the homes of six-month old children. Home visits will soon be offered to all children at their 12-month scheduled lead test, regardless of whether they have an elevated blood lead level.

We continued to undertake research and monitoring in collaboration with researchers and professional bodies to gain a more accurate picture on the issue of environmental lead exposure in the Broken Hill community and to better inform the development of sustainable public health and remediation actions to address elevated blood lead levels in local children. This included:

- The completion of year one of a three-year Broken Hill Environmental Lead Study (BHELS) in collaboration with OEH Science and Macquarie University. Data collected over the three-year study will be used to determine likely source areas contributing to the amount of lead that is in the air and deposited at various locations across Broken Hill and will be used to provide a case for and inform targeted, large scale zonal remediation programs into the future
- The completion of stage two of a study with the University of South Australia to assess the bioavailability, or proportion of lead in local soils which enters the blood when introduced into the body.
- The commencement of a study in collaboration with Macquarie University which will review the current 'State of the Science' and develop a report summarising and incorporating current studies, literature and local data to recommend best practice strategies required to eliminate environmental sources of lead exposure for local children
- The commissioning of a report that investigated the social, economic and health impacts or drivers on the ability to address lead contamination in local housing stocks
- Ongoing routine, monitoring, sampling and analysis of lead levels in local parks playgrounds, schools, day care facilities and areas of public land by BHELP staff.

During the year, we continued our partnership with Broken Hill City Council (BHCC) to remediate local parks, playgrounds, ovals and other public spaces to provide a safer environment for local

children and the entire community. Areas were remediated based on a risk assessment using data collected by the BHELP team and researchers, which identified lead 'hotspots' that pose a risk of lead exposure. Areas remediated during the year included AJ Keast Park, O'Neill Park BMX track and Soccer Oval, Lamb Oval, and the South Rd shoulder drain near the RSPCA. The year also saw the completion of a large-scale public land remediation project in the areas of Queen Street and the Willyama Common and the commencement of lead remediation works and abatement strategies as part of the Patton Park playground redevelopment project. These activities are in addition to ongoing funding projects which ensure regular maintenance and cleaning of community playground areas and equipment and increased street cleaner scheduling in high risk lead areas.

Effective communications and engagement with the community through the delivery of education and awareness programs continued to be a key focus area of the BHELP. During the year, a LeadSmart Facebook social media campaign was developed and rolled out under the BHELP's LeadSmart banner and two new major education projects – one for local schools and preschools and another for people working with lead - commenced development for piloting and planned launch in the first half of the next financial year. This is in addition to attendance at numerous community events and forums.

The LeadSmart Facebook social media campaign launched September 2017 and ran until April 2018. The campaign consisted of six mini campaigns – based on the six LeadSmart behaviours of LiveSmart, BuildSmart, WorkSmart, StartSmart, EatSmart and CleanSmart – and were advertised on the newsfeed of Broken Hill Facebook users for a month at a time. The campaign featured cartoon images and animations to convey visual, simple and easily understood messages on how to reduce lead exposure and prevent harm from lead. The campaign was extremely successful in reaching and engaging with the Broken Hill community – serving over 545,091 impressions; reaching an average of 5,389 individual Broken Hill Facebook users per campaign asset; garnering over 40,000 engagements from Broken Hill people through likes, comments and shares; and tallying a total reach of 424,187 Facebook users, who had content from the LeadSmart Facebook page enter their screen over the campaign period. In addition, the campaign generated 1,929 new or first-time users to the LeadSmart education website.

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 under 5 years of age 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 Broken Hill City Council, Councillor and Deputy Mayor) was appointed Chairperson at this meeting.

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

### Committee members

<b>Name</b>	<b>Representation</b>
Marion Browne	Chairperson BHELP Steering Committee Chairperson BHLRG Broken Hill City Council, Councillor and Deputy Mayor
Ken Barnett	General Manager, Broken Hill Base Hospital, NSW Health
Priscilla Stanley	Manager Health Protection, Western NSW Local Health District, NSW Health
Bilyara Bates	ALRG Project Officer, Aboriginal Affairs
Ann Bennett	ALRG Aboriginal Health Practitioner, Maari Ma Health Aboriginal Corporation
Craig Bretherton	Manager Regional Operations Riverina Far West, NSW EPA
Verina Crawford	ALRG

	Clinical Leader, Aboriginal Mental Health Drug and Alcohol Kincumber House
Cathy Dyer	BHLRG representative Executive Manager Corporate Services, Maari Ma Health Aboriginal Corporation
Jodielyn Edge	ALRG Heritage Conservation Officer, Office of Environment and Heritage
Tegan Hinchey-Gerard	ALRG Senior Project Officer, Aboriginal Affairs
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

	30 August 2017	22 November 2017	08 March 2018	31 May 2018
<b>Marion Browne</b>	✓	✓	✓	✓
<b>Aboriginal Lead Reference Group – Kaylene Kemp, Ann Bennett, Tegan Hinchey-Gerard, Bilyara Bates, Donnalee Kennedy, Verina Crawford, JodieLyn Edge, Jared Menz</b>	✓	✓	✓	Apology
<b>Ken Barnett</b>	✓	✓	✓	✓
<b>Priscilla Stanley</b>	Was not appointed on Committee until March	Was not appointed on Committee until March	✓	✓
<b>Craig Bretherton</b>	✓	✓	✓	✓
<b>Cathy Dyer</b>	✓	✓	✓	✓
<b>Professor David Lyle</b>	✓	✓	✓	✓
<b>Gary Whytcross</b>	✓	✓	✓	✓

## Aboriginal Lead Reference Group

The Group comprises seven 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 Aboriginal Corporation 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 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, Western NSW Local Health District and NSW Health Aboriginal Environmental Health Unit also support the employment of an Aboriginal Environmental Health Trainee – hosted by the BHELP and Far West Local Health District.

## 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 2018 (\$)</u></b>
<b>BHELP Operations</b>	\$821 810
<b>Communication &amp; Engagement</b>	\$260 345
<b>Aboriginal Children</b>	\$250 000
<b>FWLHD</b>	\$250 000
<b>Research and Monitoring</b>	\$208 620
<b>Clean Up / Remediation</b>	\$115 830
<b><u>TOTAL</u></b>	<b>\$1 906 605</b>
<b><u>TOTAL BUDGET</u></b>	<b>\$1 898 100</b>
<b><u>NET RESULT</u></b>	<b>\$ 8 505 Funded by EPA</b>

## SUMMARY OF BHELP ACTIVITIES AND PERFORMANCE

### University of South Australia Bioavailability Study

Stage two of the study to assess the bioavailability of lead in Broken Hill soils was completed in the reporting period.

Assessment of Broken Hill soils was undertaken using an in vivo mouse model in a laboratory environment. The study highlighted that lead relative bioavailability — the proportion of lead uptake into the circulation system of the body - was significantly lower than the proportion used to derive the Lead Health Investigation level (HIL) in the National Environmental Protection Measure (NEPM).

Furthermore, one third of the samples were also significantly lower than the default bioavailability value used in the Integrated Exposure Uptake Biokinetic model (IEUBK).

This research will be used to inform remediation projects, including associated risk management frameworks for minimising lead exposure in Broken Hill.

### Macquarie University - State of Science Report

During the year, the BHELP in collaboration with Macquarie University commenced a study which will review the current 'State of the Science' and will include the development of a report summarising and incorporating current studies, literature and local data to recommend best practice strategies required to eliminate environmental sources of lead exposure for local children. The study and report will:

- Summarise and describe the historical and current sources of lead exposure for children living in Broken Hill.
- Describe current trends in blood lead levels among young children in Broken Hill, the groups most at risk of elevated blood lead levels and the impact of current blood lead levels on the overall community and groups with highest blood lead levels.
- Review and summarise relevant peer-reviewed and 'grey' literature to identify potential strategies for lowering children's blood lead levels in Broken Hill.
- Strategies outlined in the report will focus on the dominant sources of lead exposure identified for Broken Hill

## BDA Group - Economic Report

In the reporting period, the BHELP commissioned a report to investigate the social, economic and health impacts or drivers on the ability to address lead contamination in local housing stocks

The scoping assessment and final report identified the following potential incentives and drivers:

- The ongoing health, productivity and associated social costs of managing people impacted by lead in their homes vastly outweighs the modest costs to abate lead risks in the home environment
- That appropriate abatement would not occur if left to the market as these costs are not able to be recovered through rental or resale prices
- That direct regulation, public provision or incentives (positive or negative) are required
- That the development of a social impact bond be investigated to address Broken Hill 'legacy' lead issues.

## Contemporary dust analysis project

The Broken Hill Environmental Lead Study (BHELS) is a three-year study commissioned by the Broken Hill Environmental Lead Program (BHELP) to determine likely source areas contributing to the amount of lead that is in the air and deposited at various locations representative of lead exposure across Broken Hill.

The Office of Environment and Heritage (OEH) was engaged to develop and deliver the study, in collaboration with the BHELP and with Macquarie University.

The BHELS project plan was established during the first year of the project to provide strategic direction for the monitoring of airborne and deposited lead. This included the best sampling locations, sampling parameters, data handling and quality assurance procedures.

Wind directional high-volume air gauges were installed at five sites representative of community exposure to lead in Broken Hill. Dust deposition samplers were installed at the same sampling sites to provide information on total dust deposition and deposited lead levels.

During the year, each air gauge continuously measured the wind speed and direction, air temperature and barometric pressure, and logged the volume of air sampled. The filters were changed weekly. Total suspended particle (TSP) samples were collected in the filters of the deposition samplers over a seven-day period before being sent to an independent laboratory for analysis.

Part of the first year of the study was to commission Macquarie University to test advanced Scanning Electron Microscopy techniques to see if they were capable of distinguishing samples containing 'fresh' environmental lead (e.g. recently mined or milled material) from older or 'legacy' lead particles. However, they were not able to determine the age of lead particles, and thus could not distinguish lead deposited, for example five years ago, from lead deposited thirty years ago.

Data collected over the three-year study will be used to determine likely source areas contributing to the amount of lead that is in the air and deposited at various locations across Broken Hill and will be used to provide a case for and inform targeted, zonal remediation programs into the future.

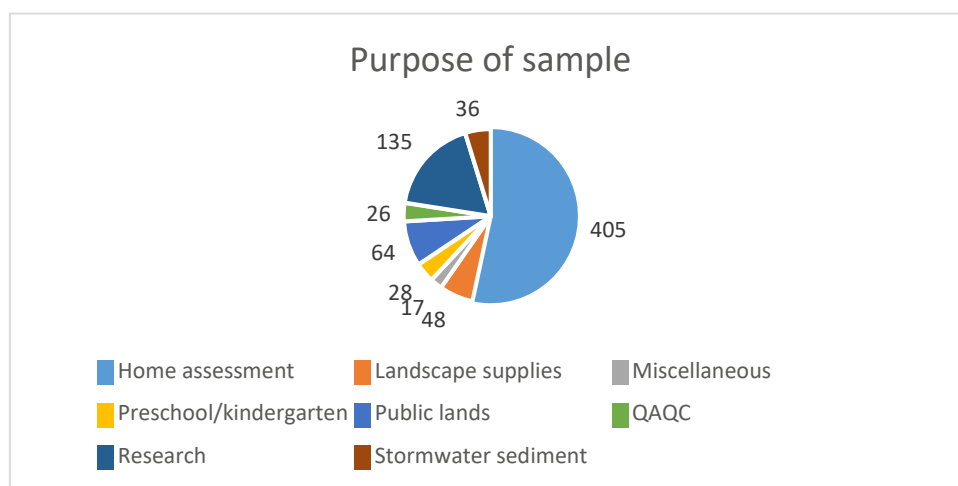
#### Routine sampling, testing and assessment

Two portable X-Ray Fluorescence (XRF) machines 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 machines to undertake routine sampling at playgrounds, preschools, schools, family day care 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 759 samples were taken at 109 sites across the city using the XRF machines.



#### Communications and Engagement Strategy

LeadSmart is the name of the BHELP's community engagement strategy aimed at raising awareness of the lead issue and educating on the simple, affordable ways that people can reduce risks of lead exposure in the Broken Hill community. During the year, one new education program was developed and rolled out under the LeadSmart banner and two new major projects commenced development for piloting and planned launch in the first half of the next financial year. This is in addition to attendance at a number of community events and forums as part of the BHELP's strong commitment to understanding and improving how we engage with the local community and building strong relationships to deliver timely and accurate information and programs to help protect locals from lead harm.

## LeadSmart social media campaign

In September 2017, the BHELP launched a LeadSmart social media campaign, consisting of six mini campaigns each featuring an animated video advertisement, and two still cartoon image link ads based on one of the six key LeadSmart behaviours to reduce lead exposure – Eat Smart, Clean Smart, Build Smart, Live Smart, Work Smart, Start Smart.



Each mini campaign was “seeded” or advertised on the newsfeed of Broken Hill Facebook users for approximately one month from September 2017 to April 2018.



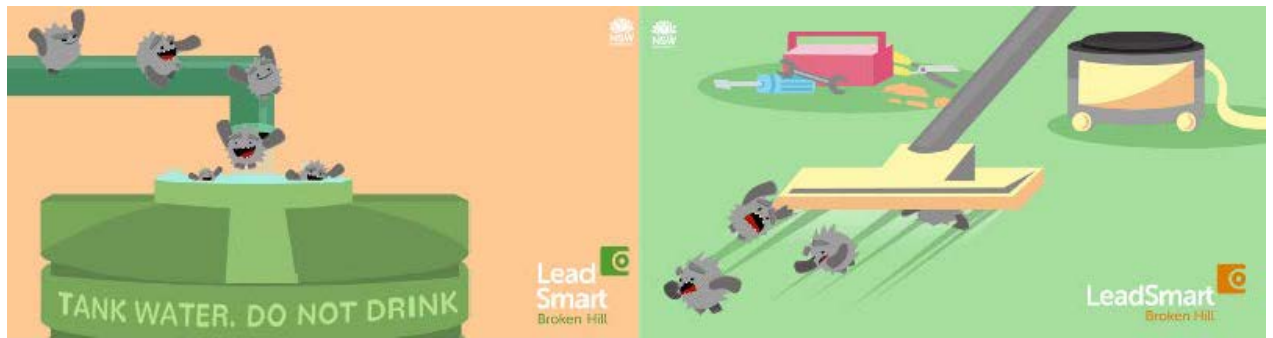
The campaign was extremely successful in reaching and engaging with Broken Hill Facebook users (and beyond) on the simple ways to reduce lead exposure and prevent harm from lead. The following is a snapshot of the campaign’s performance:

- Impressions: The campaign served over 545,091 impressions - the number of times content / ads appeared on the newsfeed or screen of all Facebook users
- Post Reach – served an average of 5,389 individual Broken Hill Facebook users per campaign asset.

VIDEO ADS	REACH	LINK ADS	REACH
Build Smart	6,579	Build Smart - Respirator	4,082
Clean Smart	6,243	Build Smart - Vacuum	3,686
Live Smart	7,610	Clean Smart - Washing Toys	4,188
Start Smart	7,661	Clean Smart - Window	3,009
Work Smart	8,640	Eat Smart - Orange	4,279
Eat Smart	7,116	Eat Smart - Kangaroo	4,975
		Live Smart - Washing Hands	2,299
		Live Smart - Tank Water	6,882
		Work Smart – Work gear outside	5,712
		Work Smart – Wipe down personal items	4,017
		Start Smart - Sit at table	4,837
		Start Smart - Get tested	5,193

- Engagements: Over 40,000 engagements from Broken Hill people through likes, comments and shares.

- Total Reach: 424,187 Facebook users had content from the LeadSmart Facebook page enter their screen over the campaign period.



- Website: both the still link and video ads generated clicks and traffic through to the LeadSmart website via the 'learn more' buttons and promotion of the website address. Between 22 September 2017 and 16 April 2018 there were 1,963 users to leadsmart.nsw.gov.au - with 1,929 of these being new / first time users. This is impressive when you compare to 1,908 new users over same period in previous year when the first stage of the LeadSmart community engagement strategy was launched.



### Community events, promotions and targeted education

Our team continued to regularly attend and participate in targeted community events and presented to groups and forums to understand community concerns on the lead issue, seek feedback on BHELP projects and to deliver LeadSmart key messages, education and communication materials.

The following is a list of the activities undertaken throughout the community and to targeted groups:

- NAIDOC DAY
- Children's Day @ the Park
- International Lead Poisoning Prevention Week of Action
- BHCC Xmas Pageant
- AgFair 2018
- Presented at six community groups and forums to give an overview of the program, the key focus areas and raise awareness of the lead issue. These included: FWLHD Community Consultative Group, The Geological Society of Australia, Environmental Development & Allied Professionals, pharmacy students undertaking study through the university Department of Rural Health.

## Projects in development

1. LeadSmart - e-learning modules
  - Three e-learning modules will be accessed through the existing LeadSmart website - [leadsmart.nsw.gov.au](http://leadsmart.nsw.gov.au). Animated videos and interactive quizzes will educate targeted workers on how to be LeadSmart to protect themselves, their families and community members from lead harm. Anyone who successfully completes the training will receive a LeadSmart accreditation certificate and business owners will have the opportunity to promote their accreditation throughout the community.
  - Lead in and around homes and buildings – this learning module will educate on LeadSmart practices and is targeted at anyone working in and around homes and buildings, and particularly for renovation, painting, building and maintenance work.
  - Lead on public or private land – this learning module will guide users through the simple LeadSmart practices they can adopt when doing any work on public or private land, but particularly for any job that involves disturbing existing dirt and soil and has the potential to create dust.
  - Lead for mining industry workers – this learning module will be targeted at mine employees, mine contractors and those undertaking work associated with mine activities.
2. LeadSmart - Curriculum Aligned Education Program
  - Lesson plans for teachers to deliver into classrooms for preschool to Year 6 students
  - Interactive, digital resources to support learning in classrooms and for families within the home.
  - Incursion Program / Lead Ted Junior Roadshow to be delivered by LeadSmart facilitators to preschool to Year 2 aged children in schools and preschools across Broken Hill. The 30-minute show features Lead Ted Junior and includes songs, puppets, animations, dancing and activities to engage with children and implement LeadSmart learning outcomes.
  - Teacher and student portal on the existing LeadSmart website to access resources and book incursion program.

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

The ongoing MoUs with FWLHD Child & Family Health and Maari Ma Health Aboriginal Corporation continued to increase the capacity of these health services to carry out more actions to prevent blood lead levels from becoming elevated, through the expansion of the existing blood lead screening and monitoring programs and the implementation of targeted education, early intervention, case management and remediation programs.

A key ingredient to the success of these funding arrangements has been the ability for these agencies to use funds to appoint additional staffing resources to enable enhancements to their lead health services.

**Here is a snapshot of some of the outcomes and achievements of the MOUs during the reporting period:**



- Blood lead tests are now offered at 6, 9 and 18 months in addition to the pre-existing monitoring at 12 months, 2 years, 3 years and 4 years. This expansion of the blood lead screening program has meant that earlier interventions can be undertaken where necessary when children present with elevated blood lead levels and has resulted in a better understanding of the burden of lead levels among Aboriginal and non-Aboriginal children. This more accurate picture can better inform public health action to address elevated blood lead levels in Broken Hill and the discrepancy between Aboriginal and non-Aboriginal children.
- 751 point of care tests (total number of tests) were undertaken by Child & Family Health in the reporting period compared to 498 in the previous year.
- Maari Ma Health's point of care tests have increased from 409 to 561.
- Over 210 home visits or environmental home assessments were undertaken during the year. These are now offered to all children with blood lead levels  $\geq 5$   $\mu\text{g}/\text{dL}$ . 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. Children with blood lead levels  $\geq 15$   $\mu\text{g}/\text{dL}$  and significant risks identified in the home environment were referred to the BHELP home remediation program
- Over 56% of children who had a first test of  $\geq 5$   $\mu\text{g}/\text{dL}$  during the reporting period and who have since presented for a scheduled or follow up test have reduced their blood lead levels. The majority, or 82% of children with an elevated first test, received education only as an intervention as they returned low range elevated lead levels -  $\geq 5$ -15  $\mu\text{g}/\text{dL}$ . This included general education on reducing lead exposure risks at point of care in the clinic, or targeted education in the home environment from a home visit or environmental home assessment. These results are significant, as they support education as an instrumental tool in addressing elevated blood lead levels. The value of the existing and enhanced education programs provided by both Maari Ma Health and Child & Family Health is strengthened further when it is taken into consideration that it is more difficult to reduce blood lead levels in children when they present with lower range elevated levels compared to higher range levels.
- Child & Family Health, Lead Health Education Officers continued offering education packs and home visits to families and caregivers of all six-month-old children at scheduled six-month immunisation and lead test point of contact – 162 LeadSmart education packs were distributed and 20 home visits were accepted and undertaken during the year. In addition, home visits will soon be offered to all children at their 12 month point of care test, regardless of whether they have an elevated blood lead level.
- Both services continued to provide education materials and advice at the time of point of care testing, and in addition to the implementation of educational home visits and environmental home assessments, have been offering supporting resources such as gardening and cleaning packs and sandpits to all families. Over 100 sandpits were delivered to families of Aboriginal children during the year and approximately 200 sandpits to non-Aboriginal children - to provide a LeadSmart play area for children in their home environment. Child & Family Health staff delivered 61 cleaning and gardening packs to families.
- Maari Ma Health provided support where necessary for families of children with elevated blood lead levels including transport, temporary housing relocation and nutritional supplements
- 143 newborn families were provided with a LeadSmart information booklet and were educated about risks of lead exposure at their 2 week universal home visit by a community

nurse. Where intervention was required, they were referred to a Child & Family Health Lead Health Education Officer.

- LeadSmart recipes were promoted by Maari Ma Health through a number of cooking groups lead by dieticians: one with playgroup families preparing the meal for the following day's playgroup; and two after school cooking groups.
- Lead Health Education Officers continued the Lead Ted Jnr education or incursion program in local preschools. The new Lead Ted Junior Roadshow will be launched in the new year and will be extended to children in local schools – Kindergarten to Year 2.
- During the year, Maari Ma Health and Child & Family Health staff have worked with visiting specialists, GP registrars and paediatric staff to provide education relating to lead in our community. These sessions have enabled discussions and provided important information to key medical staff who are often transient workers, not familiar with the local lead issue and the health implications to local children.

### Lead Health Report: 2017

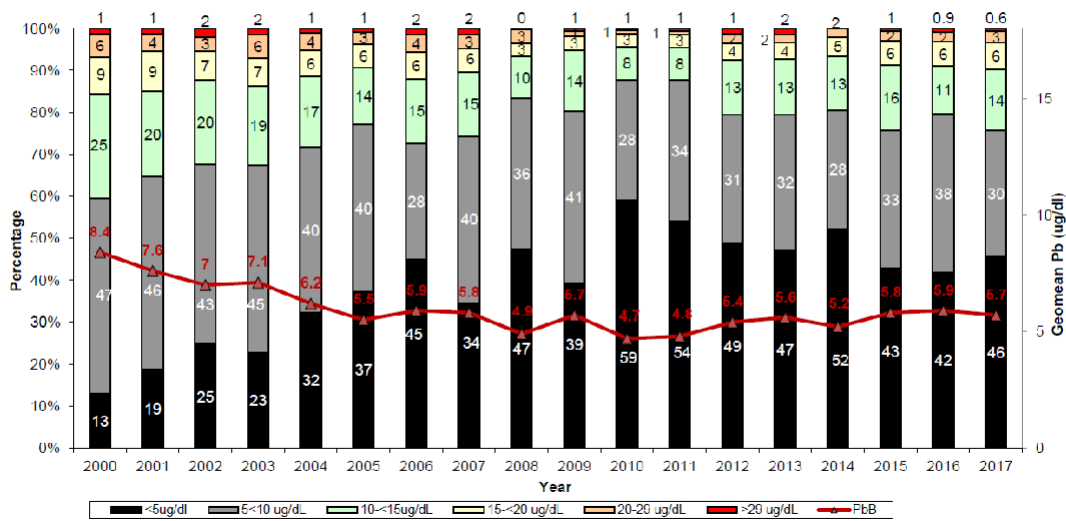
The Lead Health Report is independently compiled annually by the FWLHD in partnership with Western NSW Health Intelligence Unit and the Broken Hill University Department of Rural Health. The report provides a calendar year update on the ongoing public health issue of elevated blood lead levels in Broken Hill children aged 0-5 years using the voluntary blood lead data obtained through lead monitoring and screening services at the FWLHD and Maari Ma Health.

The results contained in the 2017 Report further reinforce the success of programs delivered by the BHELP under its three key focus areas. This includes the ongoing funding arrangements under MOUs which have additionally enabled the [above-mentioned enhancements](#) of lead health services offered by Maari Ma Health and FWLHD Child & Family Health.

The following is a snapshot of the 2017 Report:

- In 2017 there was an increase in the total number of children screened from 687 to 730.
- During this period there was a 6.8% increase in the number of Aboriginal children screened (207 to 221) and a 6.0% increase in the number of non-Aboriginal children screened (480 to 509).
- The 221 Aboriginal children screened in 2017, represents the highest number screened on record. Aboriginal children tested as a proportion of all children tested has more than doubled since 2010, from 14.6% of all children in 2010 to 30.3% in 2016 and 2017.
- The geometric lead mean level (age-sex standardised) for all children (1 to <5 years) was 5.7 µg/dL in 2017, an improvement from 5.9 µg/dL in 2016.
- The mean result for non-Aboriginal children decreased, from 5.2 in 2016 to 4.6 µg/dL– the lowest on record.
- The mean blood lead levels for Aboriginal children has improved since the start of the BHELP, with a decrease in blood lead levels from 9.3 µg/dL in 2015 to 8.7 µg/dL in 2017
- The 2017 results show 58% of non-Aboriginal children in Broken Hill had a blood lead level below 5 µg/dL, compared to only 22% of Aboriginal children. The result for Aboriginal children remained the same as 2016 (22%), whilst the result for non-Aboriginal children improved in the same period, increasing from 50% to 58%.
- When combining the results for Aboriginal and non-Aboriginal children (all children), there was an increase from 42% to 46% of all children with blood lead levels below 5 µg/dL
- The percentage of all children with blood lead levels above the notifiable level of 5 has decreased – from 58% in 2016 to 54% in 2017.

Percentage of children aged 1 – <5 years in Broken Hill by category of blood lead level and age-sex-standardised geometric mean by year



### 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 and land, including parks, playgrounds and ovals.

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. Projects included:

#### AJ Keast Park

- In addition to the boundary fence erected in previous year, mitigating public access to Block 10 Hill, a 200-millimetre concrete boundary was erected around the bare dirt area identified with elevated lead levels
- This area was capped with loam suitable for supporting plant growth
- Trees and ground cover were planted
- The entire area was mulched, and an irrigation system was installed.



*Remediation works completed at AJ Keast Park*



### **Lamb Oval**

- Capped and compacted footpath area surrounding the edges of the oval identified with high lead levels with road base.



*Lamb Oval footpath perimeter capped with road base*



### O'Neill Park BMX Track and Soccer Oval

- Capped BMX track area with road base and erected a six-foot fence around the perimeter to mitigate public access to the site and reduce risks of lead exposure.
- Capped area of Soccer Oval identified with high lead levels with loam.



*O'Neill Park Soccer Oval – loam used to cap bare dirt with elevated lead levels*

### Queen Street / Willyama Common Project

- Completed final stage of this large-scale public remediation project, with the installation of a drip irrigation system and a solar powered water tank to sustain recently planted tube stock to ensure they reach maturity. The mature tube stock will ensure that the works that included capping and mulching in the precious year will resist disturbance from environmental and other human factors.



*Solar powered water tank, tube stocks, mulch and irrigation system*

### South Road project

- The South Road project in the vicinity of the RSPCA was completed in late 2017, with the ballast works of the shoulder drain - capping the area with blue metal and preventing stormwater erosion and runoff including sediment containing high lead levels.

### **Patton Street Park Redevelopment Project**

- BHELP funds have been integrated into Council's Stronger Communities Grants funded project to ensure that high pressure washing stations, handwashing facilities and shelters can be erected over the playground equipment to reduce risks of lead exposure for children frequenting the park.

As part of ongoing funding arrangements, Council continued to undertake regular high-pressure cleaning, maintenance and inspection of playground equipment and surrounding areas of parks and playgrounds. In addition, Council maintained its increased schedule of street sweeping in high risk lead exposure areas to mitigate the risks of lead exposure in the local community.

#### 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 Aboriginal Corporation and FWLHD Child & Family Health case managers during home assessments. These additional risks include soil lead levels  $\geq 1,000$  parts per million, unstable lead-based paint, and poorly sealed cornices with evident dust trails from the ceiling.

Five Home Remediations were carried out by NSW Public Works during the reporting period 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 2017-2018

<u>PROGRAM</u>	<u>TOTAL EXPENDITURE AS AT 30 JUNE 2017 (\$)</u>	<u>EXPENDITURE 2016 2017 (\$)</u>
<b>BHELP Operations</b>	\$821 810	<p><u>\$ 770 520 Salaries &amp; On costs</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>\$ 51 290 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>	\$260 345	<p><u>\$260 345 LeadSmart stage 2</u></p> <ul style="list-style-type: none"> <li>• E learning modules and curriculum aligned education programs</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</li> </ul>

		<p>XRF to identify sources of lead exposure.</p> <ul style="list-style-type: none"> <li>• Medical supplies relating to blood lead screening</li> <li>• Lead health education and incentive activities</li> <li>• Home remediation program.</li> </ul>
<b>FWLHD</b>	\$250 000	<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}/\text{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> <li>• Early intervention program</li> <li>• Lead health education and incentive activities.</li> </ul>
<b>Research and Monitoring</b>	\$208 620	<p><u>\$106 405 OEH 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 to existing lead levels in dust and children's blood.</li> </ul> <p><u>\$23 015 Uni SA Bioavailability Study</u></p> <ul style="list-style-type: none"> <li>• Stage 2 of the project to assess the bioavailability of lead in Broken Hill soils</li> </ul>



		<p><u>\$29 750 Macquarie University State of Science Report</u></p> <ul style="list-style-type: none"> <li>• A review of the 'State of the Science' with respect to Broken Hill and what are the next steps required to eliminate environmental lead exposure in Broken Hill children</li> </ul> <p><u>\$22 490 BDA Group Economic Report</u></p> <ul style="list-style-type: none"> <li>• A scoping assessment of potential incentives to address lead contamination in Broken Hill's housing stock</li> </ul> <p><u>\$4 700 Canopy Enterprises</u></p> <ul style="list-style-type: none"> <li>• Presentation of sampling results from the Broken Hill Rail Yards to Australian Rail Track Corporation</li> </ul> <p><u>\$22 260 Sampling &amp; calibration</u></p> <ul style="list-style-type: none"> <li>• Portable X-Ray Fluorescence Equipment</li> </ul>
<b>Clean Up / Remediation</b>	\$115 830	<p><u>\$115 830 Home Remediation Program</u></p> <ul style="list-style-type: none"> <li>• Five houses were abated for those children with elevated blood lead levels where environmental risks are identified in either the house or the yard</li> </ul>
<b><u>TOTAL</u></b>	<b>\$1 906 605</b>	
<b><u>TOTAL BUDGET</u></b>	<b>\$1 898 100</b>	
<b><u>NET RESULT</u></b>	<b>\$8 505</b>	<b>Funded by EPA</b>