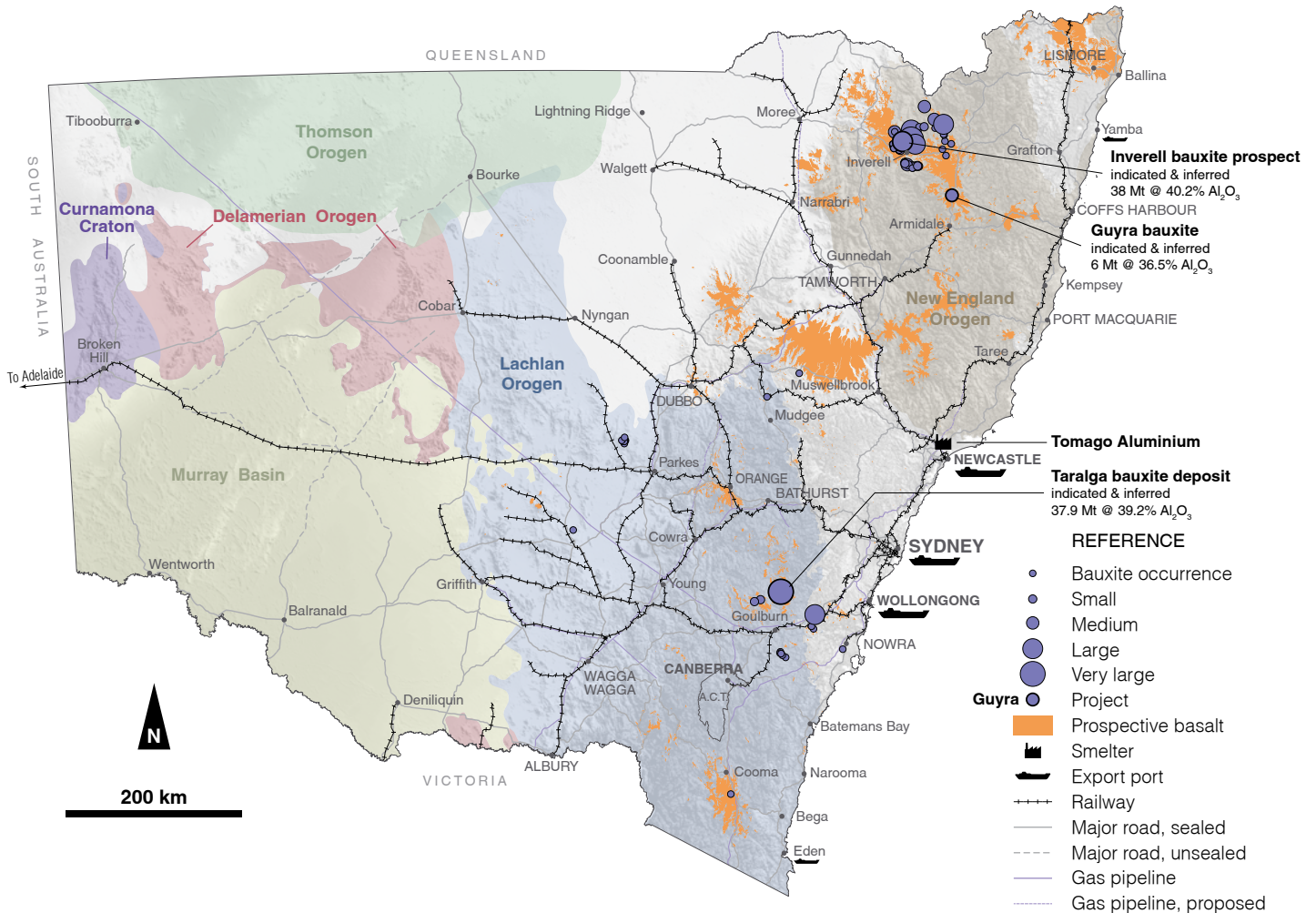


# Bauxite

## Opportunities in New South Wales, Australia



FEBRUARY 2015



### Overview

- New South Wales (NSW) has outstanding potential for the further discovery of large bauxite deposits associated with extensive Tertiary basalts in the eastern part of the state.
- Low cost exploration strategies involving ASTER and hyper-spectral analysis have been very successful in NSW.
- Access to infrastructure is excellent.
- The highest bauxite grade recorded in the state is 53.9% Al<sub>2</sub>O<sub>3</sub>, from a deposit at Sutton Forest, in the Southern Highlands.

### Geological setting

Bauxite is the world's main raw material for commercial production of alumina (Al<sub>2</sub>O<sub>3</sub>) and aluminium metal and consists mostly of the minerals gibbsite (Al<sub>2</sub>O<sub>3</sub>·3H<sub>2</sub>O), boehmite (Al<sub>2</sub>O<sub>3</sub>·H<sub>2</sub>O) and diaspore (Al<sub>2</sub>O<sub>3</sub>·H<sub>2</sub>O).

A wide range of Al-rich rocks are protoliths to bauxite; especially those with Al<sub>2</sub>O<sub>3</sub>/ΣFe<sub>2</sub>O<sub>3</sub> >1. Bauxite forms by the gradual enrichment of aluminium through development of stable aluminium hydroxides during climatic weathering.

## Deposit types

- Prospective rocks in NSW include weathered Tertiary (Paleogene–Neogene) basalts in the northern New England Orogen and around Goulburn in the Lachlan Orogen.
- Bauxite deposits in NSW typically formed by weathering during warm and wet climatic periods in the Cenozoic, to produce a porous friable layer on basalt. Many have been protected from erosion by a thin, overlying layer of basalt.
- Commercial concentrations of bauxite can occur as blanket deposits (the most common type in NSW), interlayered deposits, pocket deposits and detrital deposits.
- The Hylogger™ at the WB Clarke Geoscience Centre in Londonderry effectively identifies aluminium-rich minerals in bauxite and also clay minerals which can adversely affect the ore grade.

## Project highlights

### Taralga (near Goulburn)

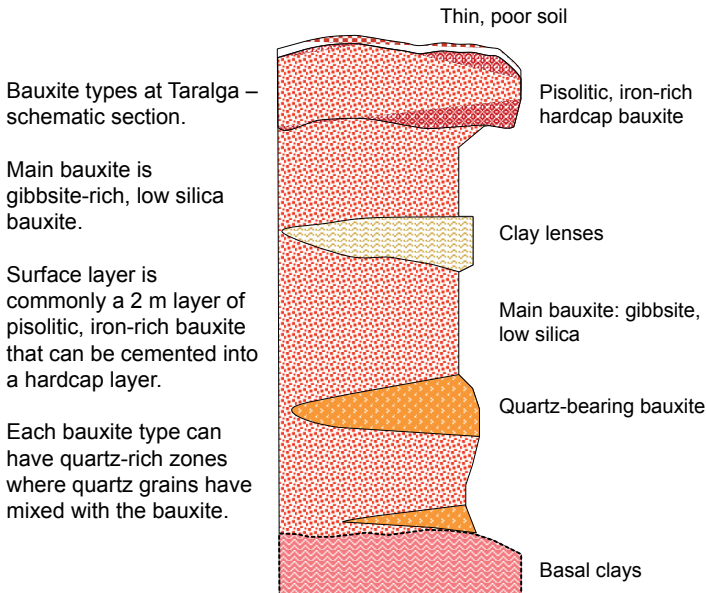
- Inferred resource is 37.9 Mt @ 39.2% Al<sub>2</sub>O<sub>3</sub> and 53% of the resource is suitable for direct shipping.
- A 38 m-thick continuous bauxite intersection occurs at Mount Rae.
- Similar to the world-famous Darling Ranges bauxite deposits, including quartz-rich, low-reactive-silica bauxite zones.

### Inverell

- Resources were upgraded to 38 Mt in 2012.
- Prior to the discovery of the Weipa deposits in Queensland, the Inverell district NSW hosted Australia's largest combined bauxite reserves.

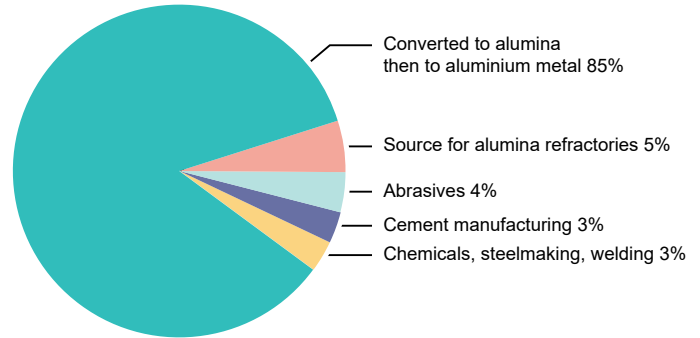
These medium-quality, low-silica, gibbsite-rich bauxite deposits are suitable for low-temperature alumina refineries and for abrasives.

### Taralga bauxite types



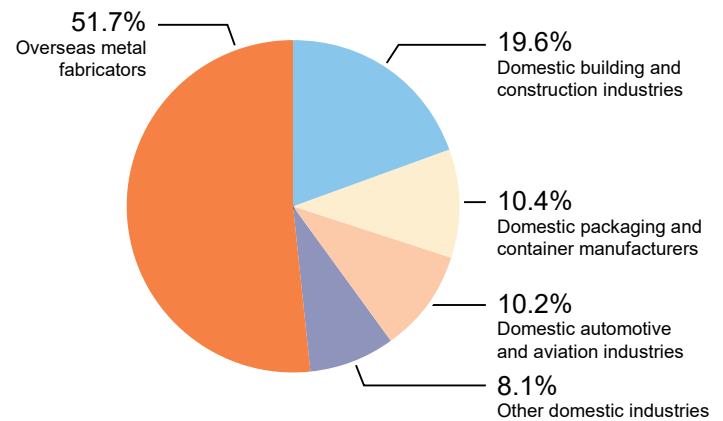
Typical bauxite profile of deposits in the Taralga area.  
Source: ABx ASQ Announcement 12 May 2011

## Domestic uses for bauxite, 1999



Source: Whitehouse J. et al. 2006. Industrial Mineral Opportunities in New South Wales. *Geological Survey of New South Wales, Bulletin 33*.

## Markets for aluminium metal smelted within Australia 2013-14 based on revenue data



N.B. 73.5% of bauxite industry revenue is derived from within Australia through alumina processing subsidiaries, and 74% of alumina revenue is gained through exports mainly to foreign aluminium smelters.

Source: <http://www.ibisworld.com.au>  
Bauxite: IBISWorld Industry Report B0802  
Alumina: IBISWorld Industry Report C2131  
Alumina: IBISWorld Industry Report C2132



Small bauxite workings near Taralga (courtesy of Australian Bauxite (ABx) Limited).

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