Project Magnet Pit to Port
PCS Implementation
exports approximately 12 million tonnes per annum of hematite ore to China per annum from its Middleback Ranges and Southern Iron mining operations in South Australia and the doubled port capacity at Whyalla, South Australia.

includes Moly-Cop grinding media, the largest supplier of grinding media (grinding balls and grinding rods) in the world, servicing the global mining industry. The business sells grinding media in South America, North America and Australasia supplying around 950 thousand tonnes of product per annum.

manufacturing, distribution and recycling businesses. The division manufactures long steel products, structural pipe and tube, and wire products in Australia; it distributes structural steel and reinforcing products in Australia with around 200 sites across the country, and supplies scrap metal to foundries, smelters and steel mills in Australia and internationally
In addition to Australian operations, Arrium operates over 40 facilities overseas with the majority of these including major mining consumables, manufacturing and recycling sites in North and South America, New Zealand and Asia.
2000 spun out from BHP Billiton as OneSteel - when it was almost entirely a domestically focussed steel manufacturer and distributor. The company has subsequently focussed on growing its resource based businesses and now has significant mining and mining consumables businesses, as well as its steel and recycling business.

2007 buy out Smorgon Steel and merged the two operations

2010 acquired two companies, Chile-based forged steel grinding balls producer Moly-Cop, and Canada-based AltaSteel, a producer of ball stock for forged grinding balls

2011 completed the acquisition of WPG Resources Iron Ore Assets – Southern Iron Mining operations

2012 OneSteel officially became Arrium Limited
Test production of Magnetite Filter Cake over temporary discharge conveyor.
<table>
<thead>
<tr>
<th>Mining</th>
<th>Mining Consumables</th>
<th>Steel &amp; Recycling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron ore mines</td>
<td>Moly-Cop</td>
<td>Australian Distribution</td>
</tr>
<tr>
<td>Middleback Ranges DSO</td>
<td>Australasia, Australia, North America, South America</td>
<td>ARC - Australian Reiforcing Company</td>
</tr>
<tr>
<td>Pellet plant</td>
<td>AltaSteel, Waratah Steel Mill</td>
<td>OSR - OneSteel Reiforcing</td>
</tr>
<tr>
<td>Southern Iron DSO</td>
<td>Electric Arc Furnace, Bar Mill, Rail &amp; Forge</td>
<td>Merchandising</td>
</tr>
<tr>
<td>Dolomite mines Port operations</td>
<td>Wire Ropes</td>
<td>Metaland</td>
</tr>
</tbody>
</table>

New Zealand Distribution segment not shown (represents OST's 50.3% shareholding in Steel & Tube Holdings Limited)
Arrium Hematite and Magnetite Streams - Process Flow Overview

Mine Pits → Iron Making → Steel Making → Steel Products

C&S → Concentrator → Filter / Flux → Pellet Plant

Magnetite

Hematite

OBP → Export Facilities → Ports
Manufacturing
## Arrium Manufacturing Structure

### Whyalla
- Blast Furnace
- Basic Oxygen Steelmake (BOS)
- Combi-Caster
- Billet Caster
- Structural Mill
- Rail

### Rod and Bar
- Sydney EAF
- Laverton EAF
- Sydney Bar Mill
- Newcastle Rod Mill
- Laverton Bar Mill
- Laverton Rod Mill
- Newcastle Conti-Stretch facility

### Wire
- Newcastle Wire Mills
- Geelong Wire Mill
- Jindera Wire Mill

### Tube Mills
- Structural Mills
- Acacia Ridge Tube Mills
- Somerton Tube Mills
- Newcastle Tube Mills
- Precision Mills
- Sunshine Tube Mill
- Kwinana Tube Mill

### Products Produced:
- **Blast Furnace – Iron**
- **BOS - Liquid Steel**
- **Combi-Caster – Slab**
- **Billet Caster – Billets (inc specials)**
- **Structural Mill – Hot Rolled Structural**
- **Rail – Head Hardened, Plain Carbon and Sleepers**

- **EAFS – Billets**
- **Bar Mills – Merchant Bar** (rounds, angles, channels, flats, squares), Reinforcing bar and Roof bolt
- **Rod Mills – Reinforcing rod, rod for wire, small rounds, coiled and straight rod, Conti-Stretch rod coils**

- **Manufacturing wire**
- **Rural posts and fencing**
- **Wire ropes feed**
- **Steel in Concrete wire**

- **Structural pipe and RHS**
- **Precision tube**
Integrated Steel Product Flow

**Whyalla Steel Make**
- Whyalla Caster
  - Slab 950-1800mm x 250mm thick
  - Bloom 350-450 x 250 mm thick
- Whyalla Billet Caster
  - 160 & 127 square mm Billets
  - Includes Specials/SEN

* Demonstrate capacities assume 24 hour 7 day operation

**EAFS**
- Laverton EAF
  - 150square
- Sydney EAF
  - 127 square mm Billets

**Product Mills**
- Whyalla Structural Mill, (HRS, Rail & Sleepers)
- Product Mills
  - 2,300ktpa
  - Laverton Bar
  - Laverton Rod
  - Sydney Rolling Mill
  - Newcastle Rod
  - Waratah Bar Mill
- Wire Mills
  - Wire
  - Fence Posts

Number of billet grades Circa 110
Number of finished goods SKUs Circa 3500
Mining – Sites
**Southern Iron Region**
- 16.4Mt @ 63.1%Fe (PK only)
- 32.5Mt DSO resource @ 63%Fe

*Magnetite resource not yet reviewed adequately to declare by Arrium*
- 569Mt Magnetite resource @ 35%Fe**

*OST Reserve / Resource Statement YEJ2012

**Middleback Ranges**
- 44.4Mt Reserve @ 59.5%Fe
- 153.2Mt total resource @ 58%Fe
- 70.5Mt Magnetite Reserve @ 41.8% mass rec
- 228.2Mt Magnetite Resource @ 38.8% mass rec

* OST Reserve / Resource Statement YEJ2012

**Ardrossan**
- Dolomite Mine Resource 71Mt

*WPG Reserve / Resource Statement YEJ2011
Southern Iron – Mine Area

Peculiar Knob
- Located 90kms from Coober Pedy
- ~ 600kms from Whyalla
- High Grade ore ~63% (all-in fines shipped)
- Infrastructure ~$86m
- Haul Road 96kms to Wirrida

Other Tenements
- Hawks Nest
- Windy Valley
- Mount Brady
- Tenements adjacent to Stuart Highway
- Ferrous and non-ferrous exploration
Middleback Ranges – Mine Areas

Middleback Region
Range consists of 15 mine pits
• Mines are linked by an Arrium owned narrow gauge rail network, with G&W operating rolling stock to move ore from mines to Port
• Dedicated Power and Water services are provided across the Middleback Range of mines

Iron Knob area
Pits: Monarch, Princess East, Princess West

Iron Baron area
Pits: Prince Nth, Prince, Little Baron, Baron East, Queen, Cavalier
• Includes an Ore Beneficiation Plant, and crushing & screening for both DSO and Beneficiation feed

North SMR area
Pits: Knight Nth, Knight Sth, Chieftain

South SMR area
Pits: Duke, Magnet, Duchess North*
• Includes an Ore Beneficiation Plant, and fixed plant crusher and magnetite concentrator
Mining – Ports
The first iron ore loading jetty was completed in 1901 together with a tramway of some 60km from Iron Knob.

Now referred to as the Outer Harbour, a modern jetty #2 has since replaced the timber.
Whyalla Port History – Outer Harbour

Outer Harbour No 2 Jetty
Whyalla Port History

- 1939  Construction of the first blast furnace, Inner Harbour and shipyard (slipways and fit-out wharf) commenced

- 1978  Shipyards closed after building 66 vessels. Inner Harbour continues to support the Steelworks

- 2004  Announced Project Magnet (convert Steelworks to magnetite feed and free up hematite reserves for export)

- 2007  Outer Harbour upgrades commissioned with an export ore capability of 4Mtpa

- 2010  Outer Harbour achieves >6Mtpa through efficiency improvements

- 2013  Completed Whyalla Port expansion - 12Mtpa export ore capacity together with both narrow and standard gauge rail connections and additional transshipping capacity
An outer harbour capable of >6Mtpa servicing Arrium Mining
• Iron ore loading jetty of 2,000tph capacity, and a 10.7m berth depth
• Iron ore storage shed connected to NG rail line

An inner harbour capable of >6Mtpa servicing Arrium Mining and the Steelworks
• 650m wharf, of 10.7m draft, with berths for 1.3Mtpa steelworks products
• 2 iron ore storage sheds connected to both NG and SG rail lines
• A temporary iron ore loading berth capable of 3,000tph
• Construction in progress on a permanent iron ore loading berth capable of 4,200tph

13Mtpa transhipment fleet with 3 transhipment points
The Inner Harbour Port in operation:

Note the construction of the wharf extension on the right hand side of the photo
Cut-over and commissioning of the 4,200tph travelling shiploader on the completed 135m permanent iron ore loading berth early July 2013
The tip pocket and storage sheds have the following capabilities:

- Tip pocket can accept both standard gauge and narrow gauge trains.
- Tip pocket can offload iron ore material from trains at a rate of 4,200 tph.
- The flexibility to tip to either shed, or to bypass the sheds directly to the shiploader.
- Each shed can store up to 250,000t of iron ore.
- Each shed contains three reclaim hoppers which are fed by front End Loader.
- Conveyors are enclosed to meet EPA requirements for fugitive dust emissions.
The new shiploader has the following capabilities:

- Ability to load a range of vessels (CSL barges, CSL Whyalla and up to Handymax size) at a load rate of 4,200 tph
- An overall tramming distance of 80m
- Boom has ability to luff (raise / lower) and shuttle (travel in / out over water) allowing it to reach all areas of the hold of the design vessel(s).
- A fully enclosed discharge spout ensures no fugitive dust emissions during loading operations.
Mining – Project Magnet
Arrium Hematite and Magnetite Streams - Process Flow Overview

Mine Pits → C&S → Concentrator → Filter / Flux → Pellet Plant

Steel Making → Steel Products

Magnetite → Hematite

OBP → Export Facilities → Ports
The Concentrator – Pelletiser Process Overview

SMR Iron Duke
Mine Site Concentrator

66km Pipeline
Slurry Slurry

Whyalla Steelworks
Pelletising Plant

Iron Ore → Pellets

Building Our Future
Project Magnet – Concentrator to Pelletising Process

Purpose

To refine iron ore rock mined at SMR Iron Duke mine site into

Iron-rich pellets at the Whyalla Steelworks Pelletising Plant

These will then be used for conversion into hot metal at the existing Whyalla Steelworks Blast Furnace
To refine iron ore involves two stages:

- Grinding to a fine powder first in grinding rolls and then in a ball mill
- Mixing the powder with water to make a slurry, then magnetically separating the iron rich particles from the waste particles (beneficiation)
During construction

Two years after construction

- The Slurry pipeline during and after installation – an environmental accomplishment of which we are proud
To produce pellets from slurry involves three stages:

– Catch and store the slurry in tanks (storage)
– Remove the water (filtering) and mix in a binder to get back to a moist cake
– Transfer to existing Pelletising Plant for:

  • Forming the cake into ‘green’ pellets (agglomeration)
  • Curing the ‘green’ pellets by drying and firing in heat (induration)
Slurry storage tanks for receipt of pipeline concentrate

Slurry filter building

One of two slurry Storage tanks
Inside the slurry filter building
- two filters convert slurry to filter cake at 9% moisture

Mixing in the binder
Project Magnet – Concentrator to Pelletising Process

Transfer conveyor – the connection to the Pellet Plant

- Agglomeration of filter cake into ‘green’ pellets
- Induration into final pellets

Shipping bins with pellets

- Final pellet storage
Project Magnet Process Control System
<table>
<thead>
<tr>
<th>Level</th>
<th>SMR Conc</th>
<th>PPL Filter / Flux</th>
<th>WHF Inner Harbour</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – I/O’s</td>
<td>Analog</td>
<td>769</td>
<td>285</td>
</tr>
<tr>
<td></td>
<td>Digital</td>
<td>1,868</td>
<td>1,381</td>
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<tr>
<td>Drives</td>
<td>LV</td>
<td>167</td>
<td>67</td>
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<tr>
<td></td>
<td>MV</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>2 – Controllers</td>
<td>CLX</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>3 – SCADA</td>
<td>Servers</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Clients</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Eng’g WS</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Level</td>
<td>What We Have in Place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 – I/O’s</td>
<td>Flex, CLX I/O, PowerFlex (MV &amp; LV)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 – Controllers</td>
<td>ControLogix, SLC’s, GuardLogix</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 – SCADA</td>
<td>FTViewSE, PanelView, FTHistorian SE</td>
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</tr>
<tr>
<td>4 – MES</td>
<td>PI2PI, OSI PI, Babelfish, Pit2Port (Dev)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 – ERP</td>
<td>SAP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ore Process Control System and MES Interfaces Overview
Project Magnet – PCS

5-BS-003 Filter Plant LV Switchroom

3rd Floor Server Room

Local Filter Plant Upstairs Control Room

Flux Plant Remote Control Panel

5-BS-004 Flux Plant LV Switchroom

To Mines

OneSteel PLC1
OneSteel PLC2
Filter Press A
Filter Press B

LimeDosing (Not Networked)
Commercial Lime CompactLogix Not Used

Reference Drawing X145550 – System Network Architecture

Shelf in EDP
Test production of Magnetite Filter Cake over temporary discharge conveyor

Project Magnet – PCS
Test production of Magnetite Filter Cake over temporary discharge conveyor

Project Magnet – PCS
Mining Development Update
Arrium – New Product Offers

History
- HGO/MGO/LGO marketed as individual products in 2009
- Doubled size of business to 12Mtpa through Southern Iron and Port development
- Peculiar Knob ore (63% Fe) blended with MBR LGO material to deliver average Fe ~60% product
  - Available through leveraging Arrium’s unique position
  - Delivers volume and cost benefits

Two new blended fines products
- Whyalla blend – MBR fines (as well as MBR lump)
- Opal blend – Peculiar Knob fines / MBR fines
- Average sales Fe expected to be ~60%
- Silica/Alumina 6-9%, other impurities low
- Low moisture (Whyalla blend ~4%, Opal blend ~2%)
- Expanded port and rail infrastructure are key enablers for blending
- Strong market and customer demand for 59-61% Fe ore

Arrium’s blended products are well placed in an evolving iron ore market
Mining expansion to double size of business

- Completed on time and budget
  - Southern Iron ‘ground breaking’ October 2011
  - First sales of Southern Iron ore October 2012
  - Achieved target sales rate of 12Mtpa June 2013
- 4th largest iron ore producer in Australia
- Port to be at 13Mtpa capacity July – higher capacity ship loader in place
- Success through leveraging core competency in development and execution of projects
- Reasonable aspirations for 12Mtpa over 10 years
- Average sales Fe expected to be ~60%
- Customer base predominantly China, but diversifying to include North Asia
- Tailored new blended products
- Sales and marketing offices in Australia and China
  - Opportunity to utilise spare capacity of port
  - Exploration
- Ferrous and non-ferrous
- Track record of adding reserves
Arrium History

Project Magnet announced 2004 (~$400M)
- Conversion of Steelworks to Magnetite ore – creation of new hematite ore export business
- Targeted 4 Mtpa
- New export facility including narrow gauge rail upgrade from MBR and transhipping
- Completed December 2007

Project Magnet Phase 2
- ‘Sweated’ assets to increase to 6Mtpa
- Targeted extending 6 Mtpa rate for further
- 10 years - first declared Nov. 2009

Southern Iron + Port Expansion (~$600M)
- Increase iron ore exports to 12Mtpa
- Aspirational target of 12Mtpa for 10 years

Business doubled on time and budget
Questions ?