The DeGrussa Copper-Gold Discovery
AMEC Congress, 1 June 2010

The Doolgunna Project “has considerable potential for the discovery of gold and base metal deposits.” – Sandfire Prospectus 2004
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DeGrussa VMS Deposit

- Located 900km north of Perth and 150km north of Meekatharra
- Lies within the 2000 m.y.o. Bryah Group of rocks, mafic volcanic and sedimentary sequence
- Current JORC resources:
  - 7.13Mt @ 5.2% Cu, 1.9g/t Au, 15g/t silver
  - 372,000t Cu metal, 439,000oz gold, 3.4Moz silver
- Evaluation drilling of the DeGrussa chalcocite mineralisation completed and Conductor 4 in progress
DeGrussa VMS Deposit

- Exploration focused on the DeGrussa locality, at depth and along strike from the known lenses
- Exploration continuing across the 400sq km tenement holding, targeting VMS mineralisation and gold
- Mining Lease Application lodged over the DeGrussa Project and mine planning underway
Exploration History – *Pre-Sandfire*

- **Horseshoe Lights VMS deposit**, located 75km north-west of DeGrussa:
  - *Copper endowment of 94,000 tonnes*
  - *Similar stratigraphic position to DeGrussa*
- Discovery of the Red Bore gossan (circa 1960s):
  - *Dolerite/sediment contact*
  - *2.2km east-south-east of DeGrussa*
  - *1km stratigraphically above DeGrussa*
Exploration History – Pre-Sandfire

  - 14 holes – best result of 7.6m @ 6.3% Cu!
  - Defined a 100m long zone, 6m thick
  - Results included 1.67g/t gold
- Great Australian Resources and Sabminco (1980s/90s):
  - Drilled holes into the Red Bore Gossan
- Other companies explored for gold and diamonds, conducting multiple aeromagnetic surveys and geochemical programs
- No electrical geophysical surveys were carried out
Sandfire undertook exploration programs comprising predominantly geochemistry, regolith, rock, soil and shallow vacuum drilling.

A program of deep regolith and bedrock sampling was undertaken using RAB and Aircore drilling.

This resulted in the discovery of five principal areas of gold mineralisation, including the Old Highway deposit:

*All hosted in sediments*
Saprolitic gold was intersected in December 2007 by a line of shallow RAB drilling across the DeGrussa locality – part of a program of reconnaissance drilling undertaken to follow up a 20ppb gold-in-soil result.

**Hole DGRB 2233 intersected 10m averaging 5.67g/t Au**

Follow-up RAB drilling programs completed in early 2008 traced this gold mineralisation corridor over a strike length of ~300m, in a south-westerly direction.

Gold mineralisation hosted in a root-less secondary silica host.

Multi-element assaying established a highly anomalous trace element suite, high in Cu, Pb, Au, Silver, As, Sb, Bi, Mo, Tellurium.
This gold mineralisation system, hosted in mafic volcanics, appeared to have prospects for discovery of primary shear-hosted gold or VMS base metal deposits.
In April 2009, Sandfire commenced a Reverse Circulation drilling program at DeGrussa to test the zone of shallow gold mineralisation at depth.

Late in the planned program, geologist Margy Hawke, elected to return to the western end of the target to drill some deeper holes.

On 28 April, Hole DGRC 101 intersected 22m of massive sulphides from 115m.

This subsequently assayed at 3.6% Cu and 3.8g/t Au.

- **DeGrussa Discovery Hole DGRC – 101**
  - Massive Sulphide Intersection, 22m from 115m to 137m: 3.6% Cu, 3.8 g/t Ag

- **Conductor 1 Discovery Hole DGRC - 114**
  - Massive Sulphide Intersection, 39m from 135m to 174m: 5.2% Cu, 1.6 g/t Ag
Following the discovery, Sandfire immediately commenced a fixed-loop electromagnetic survey over the target area.

This survey identified a weak response over the DeGrussa lode, masked by a much stronger anomaly.

Down-hole EM also identified a smaller flat-lying conductor coincident with a clay horizon hosting native copper nuggets.

- **DeGrussa Discovery Hole DGRC – 101**
  - Massive Sulphide Intersection, 22m from 115m to 137m: 3.6% Cu, 3.8 g/t Ag
- **Conductor 1 Discovery Hole DGRC - 114**
  - Massive Sulphide Intersection, 39m from 135m to 174m: 5.2% Cu, 1.6 g/t Ag
Discovery of Conductor 1 and Conductor 4 Deposits

Initial modelling of the Conductor 1 EM target suggested a deep, flatter lying anomaly, inclined in a southerly direction.

A small program of vertical RC drilling commenced to test this anomaly and intersected:

- 39m @ 5.2% Cu, 1.6g/t Au from 135m (DGRC114)
- 32m @ 4.6% Cu, 1.7g/t Au from 90m (DGRC115)
- 32m @ 2.9% Cu, 1.3g/t Au from 294m (DGRC117)

During evaluation of these two deposits (Conductor 1 and DeGrussa), systematic down-hole EM also located the Conductor 4 lens, located deeper and stratigraphically below Conductor 1.

- **DeGrussa Discovery Hole DGRC – 101**
  - Massive Sulphide Intersection, 22m from 115m to 137m: 3.6% Cu, 3.8 g/t Ag

- **Conductor 1 Discovery Hole DGRC - 114**
  - Massive Sulphide Intersection, 39m from 135m to 174m: 5.2% Cu, 1.6 g/t Ag
Evaluation and Resources

- Evaluation commenced on 5 July 2009 – hole DGDD-01 intersected high-grade copper
- Conductor 1 and DeGrussa have been drilled out on a 40m by 40m pattern of diamond drill holes
An independent JORC resource was calculated Coffey Mining and announced on 22 February 2010:

Independent JORC compliant Mineral Resource estimate for DeGrussa and Conductor 1 deposits:
7.13Mt at 5.2% copper, 1.9g/t gold and 15g/t silver

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<th>Cu %</th>
<th>Au g/t</th>
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<th>Au (k oz)</th>
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<td>Total Indicated + Inferred</td>
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<td>1.9</td>
<td>15</td>
<td>372</td>
<td>439</td>
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The chalcopyrite mineralisation capping the DeGrussa deposit has been drilled out and results are awaited

Testing of the Conductor 4 deposit is in progress

Source: Sandfire ASX Announcement, 22 February 2010
DeGrussa Project

Three principal copper-rich volcanogenic massive sulphide lenses:

- **Conductor 1** – evaluated
- **DeGrussa lode:**
  - evaluated – High Grade
  - Developed chalcocite cap
- **Conductor 4** – evaluation underway
DeGrussa Deposit Geology

Primary sulphide mineralisation:
- *Pyrite, chalcopyrite, pyrrhotite (major)*
- *Magnetite, sphalerite (minor)*
- *Galena, arsenopyrite (minor)*
- *Siderite, ankerite, stilpnomelane, minnesotaite, quartz, calcite (gangue)*

Supergene mineralisation (DeGrussa lode):
- *Native copper*
- *Siliceous cap-rock gold*
- *Oxide/carbonate copper*
- *Supergene chalcocite (tenorite, cuprite, complex tellurides, etc)*
DeGrussa Deposit Geology

Sequence has a southerly dip

VMS mineralisation hosted in sediments

Sinistral faulting

Structure

- Sequence has a southerly dip
- VMS mineralisation hosted in sediments
- Sinistral faulting
Current Status of Exploration/Evaluation Program

- Complete coverage of 400 sq km tenement area by VTEM on 150m spaced lines
- Complete aeromagnetic survey coverage on 50m spaced lines
- Trial gravity, trial IP survey, large ground EM surveys
- Diamond drilling:
  - Holes DGDD1-204
  - Commenced July 2009
  - Completed: total pre-collar – 2,469m; Diamond Coring – 77,179m
Commenced in May 2010
Focus in the vicinity of the known mineralisation
Increasing understanding of the stratigraphy, geology and structure of the mineralisation
Heavy emphasis on geophysics including:

- *Trial IP survey over the DeGrussa centre*
- *Down-hole EM surveys*

Some 60° north inclined holes 800-900m for DHEM access, spaced systematically along the south-east and west of the DeGrussa centre
Commitment to very deep drilling for DHEM surveying, 1,600-2,000m
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