#### Hope Downs 1 - Table 1

The following table provides a summary of important assessment and reporting criteria used at the Hope Downs 1 North, Hope Downs 1 South West, and Hope Downs 1 Bedded Hilltop deposits for the reporting of Mineral Resources, and the Hope Downs 1 North and Hope Downs 1 South West deposits for the reporting of Ore Reserves, in accordance with the Table 1 checklist in The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2012 Edition). Criteria in each section apply to all preceding and succeeding sections.

#### **SECTION 1 SAMPLING TECHNIQUES AND DATA**

Criteria	Commentary
Sampling techniques	<ul> <li>General Statements</li> <li>Samples for geological logging, assay, geotechnical, metallurgical and density test work are collected via drilling.</li> <li>Diamond core drilling uses double and triple-tube techniques and samples were taken at 1 meter interval.</li> <li>Metallurgical samples are collected from via diamond core drilling of PQ-3 core.</li> <li>Dry bulk density is derived from accepted gamma-density data collected at 10 cm intervals from down-hole geophysical sondes. Density measured from accepted gamma-density is corrected for moisture from diamond drill core twinned with reverse circulation drilling.</li> <li>Mineralisation is determined by a combination of geological logging and assay results.</li> </ul>
	Deposit Specific Statements
	<ul> <li>Hope Downs 1 North</li> <li>2005-2014, drilling programmes were conducted on a north/south grid at 50 m x 50 m collar spacing utilising reverse circulation and diamond drilling. All intervals are sampled.</li> <li>Reverse circulation drilling utilises a static or rotary cone splitter beneath a cyclone return system to obtain a primary and secondary sample, with particular attention on samples collected being of comparable weights. The splitter produces two 8% samples ('A' and 'B') and one 84% reject sample. Primary 'A' sample was collected at 2 m intervals through 8% blades from the outer cone of splitter.</li> <li>Geotechnical and density samples are collected via diamond core drilling of HQ-3 core.</li> <li>Density samples are collected via diamond core drilling of PQ-3 core.</li> </ul>
	<ul> <li>Hope Downs 1 South West</li> <li>2010-2015, drilling programmes were conducted on a north/south grid at 50 m x 50 m collar spacing utilising reverse circulation and diamond drilling. All intervals are sampled.</li> <li>Reverse circulation drilling utilises a rotary cone splitter beneath a cyclone return system to obtain a primary and secondary sample, with particular attention on samples collected being of comparable weights. The rotary cone splitter produces two 8% samples ('A' and 'B') and one 84% reject sample. Primary 'A' sample was collected at 2 m intervals through 8% blades from the outer cone of rotary cone splitter.</li> <li>Geotechnical and density samples are collected via diamond core drilling of HQ-3 core.</li> <li>Density samples are collected via diamond core drilling of PQ-3 core.</li> </ul>
	<ul> <li>Hope Downs 1 Bedded Hilltop</li> <li>2012-2015, drilling programmes were conducted on a north/south grid at 200 m x 100 m collar spacing utilising reverse circulation drilling. All intervals are sampled.</li> <li>Reverse circulation drilling utilises a rotary cone splitter beneath a cyclone return system to obtain a primary and secondary sample, with particular attention on samples collected being of comparable weights. The rotary cone splitter produces two 8% samples ('A' and 'B') and one 84% reject sample. Primary 'A' sample was collected at 2 m intervals through 8% blades from the outer cone of rotary cone splitter.</li> </ul>
Drilling techniques	<ul> <li>General Statements</li> <li>The majority of drilling is oriented vertically.</li> <li>Reverse circulation drilling utilises 140 mm diameter face sampling bit with sample shroud, attached to pneumatic piston hammer used to penetrate ground and deliver sample up 6 m drill rod inner tubes (4 m starter rod) through to the cyclone and cone splitter with the aid of rig and auxiliary booster compressed air.</li> </ul>
	Deposit Specific Statements

#### Hope Downs 1 North

- Drilling is predominantly reverse circulation (representing approximately 89% of the total dataset used in geological interpretation) with a lesser proportion of percussion, dual rotary and diamond drill core (Refer to Section 2, Drill hole Information, for a detailed breakdown of drilling by method and year).
- Geotechnical diamond core was oriented using the ACE orientation tool, which marks the bottom of core at the end of each run.
- Diamond drilling was a combination of HQ and PQ core sizes (HQ-3 = 61.1 mm core diameter and PQ-3 = 83.0 mm core diameter) using double and triple tube techniques.
- Most holes were drilled wet from surface, using water injection to mitigate risks associated with fibrous mineral intersection in Marra Mamba Formation.
- Pre-1995, reverse circulation holes were predominantly drilled using dry methods, although
  wet samples were common below the water table.

#### Hope Downs 1 South West

- Drilling is predominantly reverse circulation (representing approximately 96% of total dataset used in geological interpretation) with a lesser proportion of percussion, dual rotary and diamond drill core (Refer to Section 2, Drill hole Information, for a detailed breakdown of drilling by method and year).
- Geotechnical diamond core was oriented using the ACE orientation tool, which marks the bottom of core at the end of each run.
- Diamond drilling was a combination of HQ and PQ core sizes (HQ-3 = 61.1 mm core diameter and PQ-3 = 83.0 mm core diameter) using double and triple tube techniques.
- The majority of 2010-2015 holes were drilled wet from surface using water injection to mitigate risks associated with fibrous mineral intersection in Marra Mamba Formation.
- Pre-2000 reverse circulation holes were drilled dry.

#### Hope Downs 1 Bedded Hilltop

- Drilling is predominantly reverse circulation with a lesser proportion of percussion, dual rotary and diamond drill core (Refer to Section 2, Drill hole Information, for a detailed breakdown of drilling by method and year).
- Pre 2013; all reverse circulation holes were dry drilled and 2013-2015 programmes were wet drilled.
- Diamond drilling was at PQ core size (PQ-3 = 83.0 mm core diameter) using double and triple tube techniques.

## Drill sample recovery

#### **General Statements**

- No direct recovery measurements of reserve circulation samples are performed. Sample
  weights are recorded at laboratory as sample received and at the rig is qualitatively
  estimated for loss per drilling interval.
- Diamond core recovery is maximised via the use of triple-tube sampling and additive drilling muds.
- Diamond core recovery is recorded using rock quality designation (RQD) measurements with all cavities and core loss recorded in the Rio Tinto Iron Ore acQuire™ database.
- Sample recovery in some friable mineralisation may be reduced; however, it is unlikely to have had a material impact on the reported assays for those intervals.
- Thorough analysis of duplicate sample performance does not indicate any chemical bias as a result of inequalities in samples weights.

#### Logging

#### <u>General Statements</u>

- All drill holes are geologically logged utilising standard Rio Tinto Iron Ore Material Type Classification Scheme (RTIO MTCS) logging codes and entered into the acQuire™ database package on field Toughbook laptops.
- Internal training and validation of logging includes RTIO MTCS identification and calibration workshops, peer reviews and validation of logging verses assay results.
- Geological logging is performed on 2 m intervals for all reverse circulation drilling, and either 1 m or 2 m intervals for diamond holes, depending on the level of detail required.
- All diamond drill core is photographed digitally and files stored on Rio Tinto network servers.
- Magnetic Susceptibility readings taken using a Kappameter for each interval.
- Since 2001, all drill holes have been geophysically logged using downhole tools for gamma trace, calliper, gamma density, resistivity, and magnetic susceptibility.
- Open-hole acoustic and optical televiewer image data have been collected in specific reverse circulation and diamond drill core holes throughout the deposit for structural analyses.

#### **Deposit Specific Statements**

#### Hope Downs 1 North

 Data collected from pre-2000 campaigns was recorded on paper logs, and mineral constituents resolved predominantly to 5%, with 1% resolutions also used (rarely) for minor or trace constituents.

#### Hope Downs 1 South West

 Data collected from pre-2000 campaigns was recorded on paper logs, and mineral constituents resolved predominantly to 5%, with 1% resolutions also used (rarely) for minor or trace constituents.

#### Sub-sampling techniques and sample preparation

#### **Deposit Specific Statements**

#### Hope Downs 1 North

#### Sub-sampling techniques:

- Pre-1995:
  - Reverse circulation drilling samples were collected from a rig-mounted, multi-level riffle with a split ratio of 7.5% with an 85% reject.
- 1995-1999:
  - Reverse circulation drilling samples were collected in calico bags using a four tier Jones riffle splitter producing two samples with a split ratio of 7.5% with an 85% reject.
- 2005-2014:
  - Reverse circulation drilling samples were collected using a static and rotary cone splitter beneath a cyclone return system, producing approximate splits of:
    - 'A' Split Analytical sample 8%
    - 'B' Split Retention sample 8%
    - Bulk Reject 84%.

#### Sample preparation:

- 2005-2014:
  - o 'A' split sample dried at 105° C.
  - $\circ$  Sample crushed to -3 mm using Boyd Crusher and split using a linear and rotary sample divider to capture 1 2.5 kg samples.
  - o Robotic and Manual LM5 used to pulverise total sample (1 2.5 kg) to 90% of weight passing 150 micrometers ( $\mu$ m) sieve.
  - $\circ$  A 100 gram sub sample collected for analysis.
  - Diamond drill core samples are crushed to -6 mm particle size (whole core sample) and follow reverse circulation sample preparation if they are to be assayed.
- Pre-2005:
  - Drilling was conducted by Hancock Prospecting Pty Ltd, and details of sample preparation are not available.

#### Hope Downs 1 South West

#### Sub-sampling techniques:

- 2012-2015:
  - Reverse circulation drilling was sampled at 2 m intervals. Sub sampling was carried out using a rotary cone splitter beneath a cyclone return system, producing approximate splits of:
    - 'A' Split Analytical sample 8%
    - 'B' Split Retention sample 8%
    - Bulk Reject 84%.

#### Sample preparation:

- 2012-2015:
  - o 'A' split sample dried at 105° C.
  - $\circ$  Sample crushed to -3 mm using Boyd Crusher and split using a linear and rotary sample divider to capture 1 2.5 kg samples.
  - Robotic and Manual LM5 used to pulverise total sample (1 2.5 kg) to 90% of weight passing 150 micrometers ( $\mu$ m) sieve.
  - A 100 gram sub sample collected for analysis.
  - Diamond drill core samples are crushed to -6 mm particle size (whole core sample) and follow reverse circulation sample preparation if they are to be assayed.
- Prior to 2010:
  - Drilling was conducted by Hancock Prospecting Pty Ltd, and details of sampling procedures are not available.

#### Hope Downs 1 Bedded Hilltop

#### Sub-sampling techniques:

- 2012-2015:
  - Reverse circulation drilling was sampled at 2 m intervals. Sub sampling was carried out using a rotary cone splitter beneath a cyclone return system, producing approximate splits of:
    - 'A' Split Analytical sample 8%
    - 'B' Split Retention sample 8%
    - Bulk Reject 84%.

#### Sample preparation:

- 2012-2015:
  - o 'A' split sample dried at 105° C.
  - $\circ$  Sample crushed to -3 mm using Boyd Crusher and split using a linear and rotary sample divider to capture 1 2.5 kg samples.
  - o Robotic and Manual LM5 used to pulverise total sample (1-2.5 kg) to 90% of weight passing 150 micrometers  $(\mu m)$  sieve.
  - o A 100 gram sub sample collected for analysis.
  - Diamond drill core samples are crushed to -6 mm particle size (whole core sample) and follow reverse circulation sample preparation if they are to be assayed.

#### Quality of assay data and laboratory tests

#### **Deposit Specific Statements**

#### Hope Downs 1 North

#### Assay methods:

- An X-Ray Fluorescence (XRF) analysis is conducted to determine:
  - o Pre-2005:
    - Fe, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, Mn, CaO, P, S, K<sub>2</sub>O, Na<sub>2</sub>O.
  - o 2005-2014:
    - Fe, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, Mn, CaO, P, S, MgO, K<sub>2</sub>O, Zn, Pb, Cu, Ba, V, Cr, Cl, As, Ni, Co, Sn, Sr, Zr, Na.
- Loss on Ignition (LOI) is determined using industry standard Thermo-Gravimetric Analyser (TGA):
  - o Pre-2005:
    - LOI was measured at 371° C for moisture associated with goethite and at 1000° C for moisture associated with goethite and clay minerals.
  - 2005-2014:
    - LOI was measured at three steps of temperatures: 140° 425° C, 425° 650° C, 650° 1000° C.
- Samples are dispatched to Perth for preparation and analytical testing:
  - o Pre-2005:
    - Samples were submitted to Analabs/SGS Australia Pty Ltd.
  - o 2005-2008 and 2010-2013:
    - Samples were submitted to Bureau Veritas Minerals Pty Ltd (formerly Ultra Trace Laboratories).
  - o 2009:
    - Samples were submitted to both Bureau Veritas Minerals Pty Ltd (formerly Ultra Trace Laboratories) and Analabs/ SGS Australia Pty Ltd.
  - o **2014**:
    - Samples were submitted to Genalysis Laboratory Services Pty Ltd.

#### Quality assurance measures include:

- 2005-2014:
  - Insertion of coarse reference standard by Rio Tinto Iron Ore geologists at a rate of one in every 30 samples in mineralised zones and one in every 60 samples in waste zones with a minimum of one standard per drill hole. Reference material is prepared and certified by Rio Tinto Iron Ore following ISO 3082:2009 (Iron Ores Sampling and sample preparation procedures) and ISO 9516-1:2003 (Iron Ores Determination of various elements by X-ray fluorescence spectrometry Part 1: Comprehensive procedure).
  - Coarse reference standards contain a trace of strontium carbonate that is added at the time of preparation for ease of identification.
  - Field duplicates were collected by sacrificing a 'B' split retention sample directly from the rig splitter. Duplicate insertion occurred at a frequency of one in 20. Trace zinc is included in the duplicate sample for later identification.
  - At a frequency of one in 20, -3 mm splits and pulps were collected as laboratory splits and repeats respectively. These sub-samples were analysed at the same time as the original sample to identify grouping, segregation and delimitation errors.

- Internal laboratory quality assurance and quality control measures involve the use of internal laboratory standards using certified reference material in the form of pulps, blanks and duplicates were inserted in each batch.
- Random re-submission of pulps at an external laboratory is performed following analysis.
- Chemical Analysis Testing (CAT) and Analytical Precision Testing (APT) samples were collected one per batch and submitted to third party (Geostats) as part of Rio Tinto Iron Ore quality assurance and quality control (RTIO QA/QC) procedures to attained analytical precision and accuracy.
- Analysis of the performance of certified standard and field duplicates has indicated an acceptable level of accuracy and precision with no significant bias.
- Pre-2005:
  - QA/QC practices and results are variably documented and some quality issues have been identified.
  - Overall the work conducted over this period was at an acceptable standard, however where uncertainty exists that data has been excluded.

#### Hope Downs 1 South West

#### Assay methods:

- All assaying of samples used in Mineral Resource estimates have been performed by independent, National Association of Testing Authorities (NATA) certified laboratories.
- An X-Ray Fluorescence (XRF) analysis is conducted to determine:
  - o Pre-2010:
    - Fe, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, Mn, CaO, P, S, K<sub>2</sub>O, Na<sub>2</sub>O.
  - o 2010-2016:
    - Fe, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, Mn, CaO, P, S, MgO, K<sub>2</sub>O, Zn, Pb, Cu, Ba, V, Cr, Cl, As, Ni, Co, Sn, Sr, Zr, Na.
- Loss on Ignition (LOI) is determined using industry standard Thermo-Gravimetric Analyser (TGA):
  - o Pre-2010:
    - LOI was measured at 371° C for moisture associated with goethite and at 1000° C for moisture associated with goethite and clay minerals.
  - o 2010-2016:
    - LOI was measured at three steps of temperatures: 140° 425° C, 425° 650° C, 650° 1000° C.
- Samples were dispatched to Perth for preparation and analytical testing:
  - o 1993-1999:
    - Samples were submitted to SGS Australia Pty Ltd.
  - o 2010-2013:
    - Samples were submitted to Bureau Veritas Minerals Pty Ltd (formerly Ultra Trace Laboratories).
  - o 2014-2016:
    - Samples were submitted to Genalysis Laboratory Services Pty Ltd.

#### Quality assurance measures include:

- Insertion of coarse reference standard by Rio Tinto Iron Ore geologists at a rate of one in
  every 30 samples in mineralised zones and one in every 60 samples in waste zones with a
  minimum of one standard per drill hole. Reference material is prepared and certified by Rio
  Tinto Iron Ore following ISO 3082:2009 (Iron Ores Sampling and sample preparation
  procedures) and ISO 9516-1:2003 (Iron Ores Determination of various elements by X-ray
  fluorescence spectrometry Part 1: Comprehensive procedure).
- Coarse reference standards contain a trace of strontium carbonate that is added at the time of preparation for ease of identification.
- Field duplicates were collected by sacrificing a 'B' split retention sample directly from the rig splitter. Duplicate insertion occurred at a frequency of one in 20. Trace zinc is included in the duplicate sample for later identification.
- At a frequency of one in 20, -3 mm splits and pulps were collected as laboratory splits and repeats respectively. These sub-samples were analysed at the same time as the original sample to identify grouping, segregation and delimitation errors.
- Internal laboratory quality assurance and quality control measures involve the use of internal laboratory standards using certified reference material in the form of pulps, blanks and duplicates were inserted in each batch.
- Random re-submission of pulps at an external laboratory is performed following analysis.
- Chemical Analysis Testing (CAT) and Analytical Precision Testing (APT) samples were collected one per batch and submitted to third party (Geostats) as part of Rio Tinto Iron Ore

- quality assurance and quality control (RTIO QA/QC) procedures to attained analytical precision and accuracy.
- Analysis of the performance of certified standard and field duplicates has indicated an acceptable level of accuracy and precision with no significant bias.

#### Hope Downs 1 Bedded Hilltop

#### Assay methods:

- All assaying of samples used in Mineral Resource estimates have been performed by independent, National Association of Testing Authorities (NATA) certified laboratories.
- Fe, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, Mn, CaO, P, S, MgO, K<sub>2</sub>O, Zn, Pb, Cu, Ba, V, Cr, Cl, As, Ni, Co, Sn, Sr, Zr, Na are assayed using industry standard lithium tetraborate and lithium metaborate fusion and X-Ray Fluorescence (XRF) analytical technique.
- Loss on Ignition (LOI) is determined using industry standard Thermo-Gravimetric Analyser (TGA) and was measured at three steps of temperatures: 140° - 425° C, 425° - 650° C, 650° -1000° C.
- Samples were dispatched to Perth for preparation and analytical testing:
  - o 2012-2013:
    - Samples were submitted to Bureau Veritas Minerals Pty Ltd (formerly Ultra Trace Laboratories).
  - o 2014-2015:
    - Samples were submitted to Genalysis Laboratory Services Pty Ltd.

#### Quality assurance measures include:

- Insertion of coarse reference standard by Rio Tinto geologists at a rate of one in every 30 samples in mineralised zones and one in every 60 samples in waste zones with a minimum of one standard per drill hole. Reference material is prepared and certified by Rio Tinto Iron Ore following ISO 3082:2009 (Iron Ores Sampling and sample preparation procedures) and ISO 9516-1:2003 (Iron Ores Determination of various elements by X-ray fluorescence spectrometry Part 1: Comprehensive procedure).
- Coarse reference standards contain a trace of strontium carbonate that is added at the time
  of preparation for ease of identification.
- Field duplicates were collected by sacrificing a 'B' split retention sample directly from the rig splitter. Duplicate insertion occurred at a frequency of one in 20. Trace zinc is included in the duplicate sample for later identification.
- At a frequency of one in 20, -3 mm splits and pulps were collected as laboratory splits and repeats respectively. These sub-samples were analysed at the same time as the original sample to identify grouping, segregation and delimitation errors.
- Internal laboratory quality assurance and quality control measures involve the use of internal laboratory standards using certified reference material in the form of pulps, blanks and duplicates were inserted in each batch.
- Random re-submission of pulps at an external laboratory is performed following analysis.
- Chemical Analysis Testing (CAT) and Analytical Precision Testing (APT) samples were
  collected one per batch and submitted to third party (Geostats) as part of Rio Tinto Iron Ore
  quality assurance and quality control (RTIO QA/QC) procedures to attained analytical
  precision and accuracy.
- Analysis of the performance of certified standard and field duplicates has indicated an acceptable level of accuracy and precision with no significant bias.

# Verification of sampling and assaying

#### **General Statements**

- Comparison of reverse circulation and twinned diamond drill core assay data distributions show that the drilling methods have similar grade distributions verifying the suitability of reverse circulation samples in the Mineral Resource estimate.
- Field data was logged directly onto field Toughbook laptops using pre-formatted and validated logging templates, with details uploaded to the acQuire™ database on a daily basis.
- Assay data is returned electronically from the laboratory and uploaded into the acQuire™
  database.
- 2012-2015, assay data were only accepted in the acQuire<sup>™</sup> database once the quality control process undertaken utilising Batch Analysis tool.
- Written procedures outline the processes of geological logging and data importing, quality
  assurance and quality control validation and assay importing. A robust, restricted-access
  database is in place to ensure that any requests to modify existing data go through
  appropriate channels and approvals, and that changes are tracked by date, time, and user.

## Location of data points

#### **General Statements**

 Drill hole collar reduced level (RL) data is compared to detailed topographic maps and shows that the collar survey data is accurate.  Down-hole surveys are conducted on nearly every hole, with the exception of collapsed or otherwise hazardous holes; any significant, unexpected deviations are investigated and validated. Holes greater than 100 m depth are generally surveyed with an in-rod gyro tool.

#### **Deposit Specific Statements**

#### Hope Downs 1 North

- Details on collars for pre-2005 holes were not available; field reviews have been successful in locating drill holes in some instances.
- From 2005 onwards, all drill hole collar locations at the Hope Downs 1 North deposit have been surveyed to Geocentric Datum of Australia 1994 (GDA94) grid by qualified surveyors using Differential Global Positioning System (DGPS) survey equipment, accurate to within10 cm in both horizontal and vertical directions.
- Pre-2006, survey validation processes were poorly documented but deemed to be low risk.
- From 2006 onwards, all collar survey data is validated by checking actual versus planned coordinate discrepancies.
- The pre-mining topographic surface for the Hope Downs 1 North area utilised the 2006 high
  resolution aerial photography, merged with the lower resolution Light Detecting and Ranging
  (LiDAR) data. Drill holes have not been registered to topography, as it is assumed that the
  collar pick up data is generally more reliable.

#### Hope Downs 1 South West

- All pre-2010 holes were resurveyed by Rio Tinto Iron Ore in 2008.
- From 2010 onwards, all drill hole collar locations at the Hope Downs 1 South West deposit have been surveyed to Geocentric Datum of Australia 1994 (GDA94) grid by qualified surveyors using Differential Global Positioning System (DGPS) survey equipment, accurate to 10 cm in both horizontal and vertical directions.
- Collar location data is validated by checking actual versus planned coordinate discrepancies.
   Once validated, the survey data is uploaded into the drill hole database.
- All holes interpreted and used in the resource model have surveyed coordinates. Holes with suspect collar coordinates were excluded from the data set.
- The topographic surface has been derived from a 5 m resolution composite surface developed from surface mapping and Light Detecting and Ranging (LiDAR) data from 1995-2014.
   Accuracy of the topographic surface is further enhanced by incorporation of additional spot height data including the validated DGPS hole collar points generated in each successive drilling campaign.

#### Hope Downs 1 Bedded Hilltop

- From 2012 onwards, all drill hole collar locations at the Hope Downs 1 Bedded Hilltop deposit
  are surveyed to Geocentric Datum of Australia 1994 (GDA94) grid by qualified surveyors
  using Differential Global Positioning System (DGPS) survey equipment, accurate to 10 cm in
  both horizontal and vertical directions.
- The topographic surface is based on 10 m grid sampling of the 2015 Light Detecting and Ranging (LiDAR) survey, including spot heights from DGPS drilling collars and is considered robust.

## Data spacing and distribution

#### **Deposit Specific Statements**

#### Hope Downs 1 North

- Drill hole spacing is predominately  $50 \text{ m} \times 50 \text{ m}$ , widening to between  $100 \text{ m} \times 50 \text{ m}$  to  $200 \text{ m} \times 100 \text{ m}$  on the extremities of the deposit.
- The drill spacing is deemed appropriate for sufficient deposit knowledge by the Competent Person for the Mineral Resource classification applied.
- The mineralised domains for the Hope Downs 1 North deposit have demonstrated sufficient continuity in both geology and grade to support the definition of Mineral Resources, and the classifications applied under the 2012 JORC Code guidelines.

#### Hope Downs 1 South West

- Drill hole spacing is predominately 50 m x 50 m with some areas at 100 m x 50 m and 200 m x 100 m
- Overall drill spacing is deemed appropriate for sufficient deposit knowledge by the Competent Person for the Mineral Resource classification applied.
- The mineralised domains for the Hope Downs 1 South West deposit have demonstrated sufficient continuity in both geology and grade to support the definition of Mineral Resources, and the classifications applied under the 2012 JORC Code guidelines.

#### Hope Downs 1 Bedded Hilltop

- Drill spacing is predominantly 200 m x 100 m.
- The drill spacing is deemed appropriate for sufficient deposit knowledge by the Competent Person for the Mineral Resource classification applied.
- The mineralised domains for the Hope Downs 1 Bedded Hilltop deposit have demonstrated sufficient continuity in both geology and grade to support the definition of Mineral Resources, and the classifications applied under the 2012 JORC Code guidelines.

#### Orientation of data in relation to geological structure

#### **Deposit Specific Statements**

#### Hope Downs 1 North

- Drill lines are oriented north/south, perpendicular to the deposit strike.
- The majority of drilling is completed vertically due to restrictions commonly encountered with ground conditions. Mineralisation varies from broadly horizontal to deep vertical features, resulting in a range of orientations being intersected during drilling.
- While mineralisation is frequently intersected at an angle, the orientation of mineralisation relevant to drilling is not considered likely to have introduced any material sampling bias.

#### Hope Downs 1 South West

- Drill lines are oriented north/south, perpendicular to the deposit strike.
- The deposit is located on the south eastern end of a regional anticline, and the general stratigraphic dip is gently dipping (varying between 10° to 40°) to the south with minor parasitic folding throughout and a large thrust fault through the centre of the deposit.
- Reverse circulation drilling is predominantly vertical and intersects the gently undulating stratigraphy approximately at right angles.
- Where applicable selected holes have been angled (70°-85°) to facilitate intersection of the
  prevailing stratigraphy at right angles, and to obtain downhole optical and acoustic televiewer
  data.

#### Hope Downs 1 Bedded Hilltop

- Drill lines are oriented north/south, perpendicular to the deposit strike.
- Reverse circulation drilling is predominantly vertical and intersects the folded stratigraphy at right angles.

#### Sample security

#### **General Statements**

- The sample chain of custody is managed by Rio Tinto Ltd.
- Analytical samples ('A' splits) are collected by field assistants, placed onto steel sample racks and delivered to Perth by recognised freight service and then to the assay laboratory by a Perth-based courier service. Whilst in storage the samples are kept in a locked yard.
- Retention samples ('B' splits) are collected and stored in drums at on-site facilities.
- 150 grams of excess pulps from primary samples is retained indefinitely at laboratories and external storage facilities at CTI Logistics Ltd in Perth, Western Australia.

## Audits or reviews

#### **General Statements**

- No external audits have been performed specifically on sampling techniques or data.
- Inter-lab checks were performed in 2014 and 2015. A collection of coarse retentions from randomly distributed drill holes across Hope Downs deposits were sent by Genalysis Laboratory Services Pty Ltd to Australian Laboratory Services Pty Ltd and Bureau Veritas Minerals Pty Ltd (formerly Ultra Trace Laboratories). Results of the re-analysed coarse retentions were sent by electronic distribution to Rio Tinto Iron Ore geologists for analysis. No conflicted results were identified.
- Internal Rio Tinto Iron Ore peer review processes and internal Rio Tinto technical reviews have been completed. These reviews concluded that the fundamental data collection techniques are appropriate.

#### SECTION 2 REPORTING OF EXPLORATION RESULTS

Criteria	Commentary
Mineral tenement and land tenure status	<ul> <li>General Statements</li> <li>The tenement on which the deposits are located is subject to the Hope Downs Joint Venture Agreement. The present ownership of the joint venture and the tenement is as follows:         <ul> <li>Hope Downs Iron Ore Pty Ltd 50%; and</li> <li>Hamersley WA Pty Ltd 50%.</li> </ul> </li> <li>The deposits lie wholly within Mining lease M282SA (Sec 001) granted 31/03/2006.</li> </ul>
Exploration done by other parties	Deposit Specific Statements  Hope Downs 1 North  ■ Exploration was completed by Hancock Prospecting Pty Ltd during various programs between 1971 and 1999.  ■ The pre-2005 phase of exploration by Hancock Prospecting Pty Ltd included:  □ 262 Percussion holes;  □ 523 Reverse circulation holes;  □ 108 Diamond holes.
	<ul> <li>Hope Downs 1 South West</li> <li>Prior to 2010, Hancock Prospecting Pty Ltd drilled 92 percussion holes and one diamond hole between 1993 and 1999. The type of percussion is unknown and is assumed to be reverse circulation.</li> <li>12 reverse circulation drill holes along the rail corridor to the south of the bedded deposit were drilled by BHP Billiton Iron Ore Pty Ltd in 2014 and information provided to Rio Tinto Iron Ore in 2015.</li> </ul>
	<ul> <li>Hope Downs 1 Bedded Hilltop</li> <li>19 reverse circulation drill holes were drilled by Hancock Prospecting Ltd Pty between 1996 and 1998.</li> <li>7 reverse circulation drill holes along the rail corridor to the north of the bedded deposit were drilled by BHP Billiton Iron Ore Pty Ltd in 2014 and information provided to Rio Tinto Iron Ore in 2015.</li> </ul>
Geology	Deposit Specific Statements
	<ul> <li>Hope Downs 1 North</li> <li>Hope Downs 1 North deposit is located at the eastern closure of a regional fold structure referred to as the Weeli Wolli Anticline.</li> <li>It is classified as a Marra Mamba Iron Formation hosted deposit and is divided into four areas: North-West, Flat Top, North-East 1 and North-East 3.</li> <li>The iron mineralisation consists of various types of enrichment, broadly subdivided into the iron formation-hosted "bedded" mineralisation style and weathering/redeposition products termed "detrital".</li> <li>Hope Downs 1 South West</li> <li>The deposit contains both detrital and bedded-hosted iron mineralisation.</li> <li>Bedded mineralisation is hosted within the Mount Newman Member of the Marra Mamba Iron</li> </ul>
	<ul> <li>Bedded mineralisation is hosted within the Mount Newman Member of the Marra Mamba Iron Formation. It is located within a complex geological setting that is thrust faulted, folded and overlain in part with detrital mineralisation.</li> <li>Detrital mineralisation is predominantly Marra Mamba derived Red Ochre Detrital (ROD).</li> </ul>
	<ul> <li>Hope Downs 1 Bedded Hilltop</li> <li>The deposit contains both detrital and bedded-hosted iron mineralisation.</li> <li>The bedded-hosted iron mineralisation occurs as a high-phosphorus Brockman Iron Formation deposit with a weathering overprint.</li> <li>The detrital mineralisation is a Brockman Iron Formation-derived detrital iron deposit overlying the north/central portion of the bedded Dales Gorge Member of the Archean Brockman Iron Formation.</li> <li>The geology is typically flat with some gentle folding.</li> </ul>
Drill hole Information	Deposit Specific Statements

Criteria

Commentary

#### Hope Downs 1 North

• Summary of drilling data used for the Hope Downs 1 North Mineral Resource estimate:

Year	Diamond Holes		Reverse (	Circulation	Percussion (Open hole)		
	# Holes	Metres	# Holes	Metres	# Holes	Metres	
Pre-2005	90	13,510	559	53,835	167	15,607	
2005	2	263	174	21,308	_	-	
2006	2	388	804	71,856	-	-	
2008	-	-	17	1,822	-	-	
2009	-	-	19	2,034	-	-	
2010	-	-	164	20,627	_	-	
2011	-	-	35	4,384	_	-	
2013	-	-	42	5,166	-	-	
2014	-	-	78	2,730	-	_	
Total	94	14,161	1,892	183,762	167	15,607	

- An additional 93 drill holes were used for geological interpretation only.
- A total of 283 drill holes were excluded from the dataset, due mainly to unreliable or incomplete assay and/or collar survey data. Excluded holes include:
  - o 96 Percussion holes for 5,199 m;
  - o 148 Reverse circulation holes for 14,398 m;
  - o 39 Diamond holes for 4,406.3 m.

#### **Hope Downs 1 South West**

 Summary of drilling data used for the Hope Downs 1 South West Mineral Resource estimate:

Year	Diamond Holes		Reverse (	Circulation	Percussion (Open hole)	
	# Holes	Metres	# Holes	Metres	# Holes	Metres
Pre-2010	1	263			-	_
2010	_	_	45	3,715	_	_
2011	10	634.7	40	4,954	-	-
2012	-	_	158	16,085	_	-
2013	21	1,581.9	302	26,140	_	_
2014	9	1,026.05	1151	81,080	-	-
2015	-	-	172	12,120	-	-
Total	41	3,505.65	1,868	144,094	0	0

- An additional 154 drill holes were used for geological interpretation only.
- A total of 12 BHP Billiton Iron Ore Pty Ltd holes (2,202 m) from 2014 were excluded from estimation due to lack of QA/QC data.
- A total of 3 drill holes (all pre-2000 percussion) for 405 m were excluded from the dataset, due to unreliable or incomplete assay and/or collar survey data.

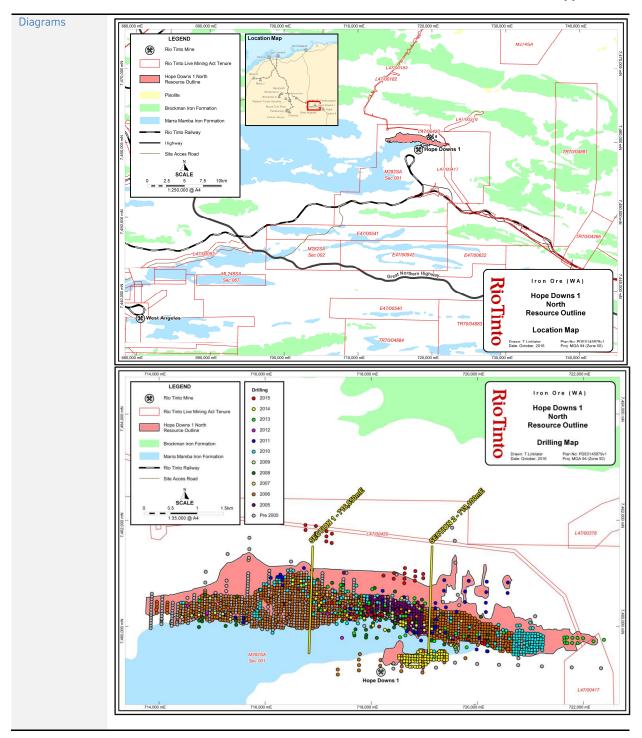
#### Hope Downs 1 Bedded Hilltop

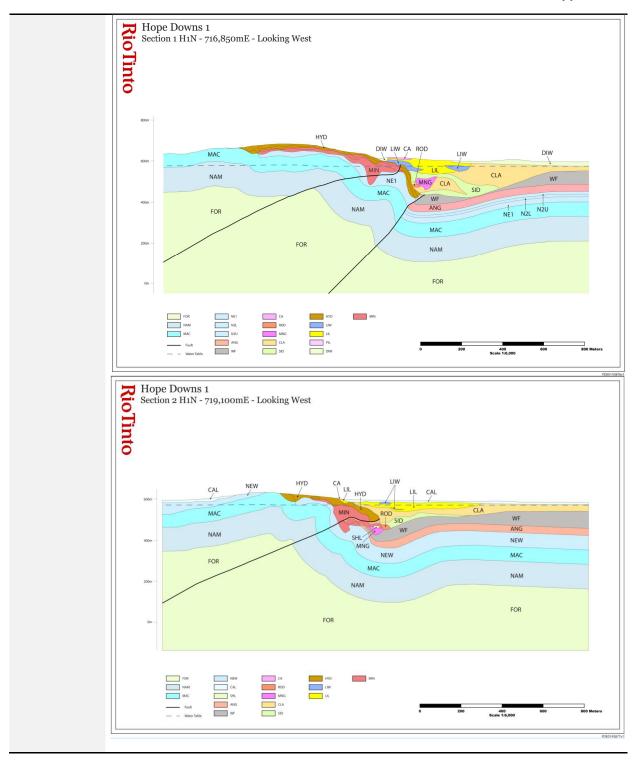
 Summary of drilling data used for the Hope Downs 1 Bedded Hilltop Mineral Resource estimate:

Year	Diamon	d Holes	Reverse C	Circulation	Percu (Open	
	# Holes	Metres	# Holes	Metres	# Holes	Metres
2012	-	-	51	5,006	-	-
2013	-	-	57	3,552	-	-

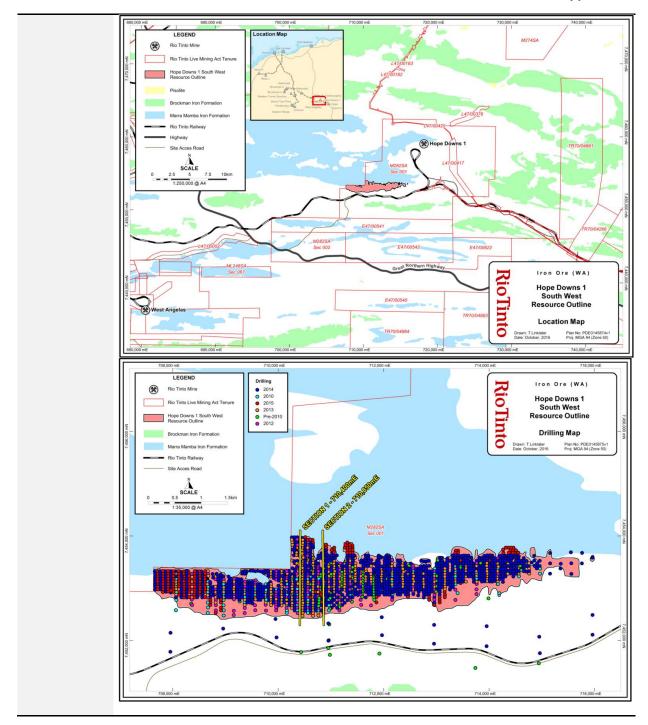
Criteria	Commentary	/							
		2014	-	-	19	2,824	-	-	
		2015	_	-	123	6,690	-	-	
		Total	0	0	250	18,072	0	0	
	•	were exclusion BH estimation	uded from P Billitor I due to l	n estimatio n Iron Ore ack of QA/(	n due to lac Pty Ltd ho QC data.	k Prospecting k of QA/QC d les (1,110 m luded due to a	ata. n) from 20	014 were ex	
Data aggregation methods	mo		estimatio	on.		peen compos	ited to 2	m for Miner	al Resource
Relationship between mineralisation widths and intercept lengths	ass tru • The and	s 1 North ervals are cociated mir e widths. e difference d three dim	reported neralisatio betweer ensional	on this often down-hol interpreta	n results in e and true	. Given the or down-hole in thickness is eralisation bo	resolved	graphically v	greater than via sectional
	pra • In g of f dril • The	lling progra ctically pos general dov true minera ling and pro d difference d three dim	ms have sible to pun-hole ir lisation vedominant between	erpendicul ntercept le widths at H nce of gentl n down-hol interpreta	ar. ngths are do lope Downs y dipping to e and true	eemed to pros s 1 South We o moderately thickness is eralisation bo	ovide an a est due to undulatino resolved	cceptable reportion of the contract of the con	oresentation near-vertical via sectional
			erval len			sentially true	width du	e to vertical	drilling and

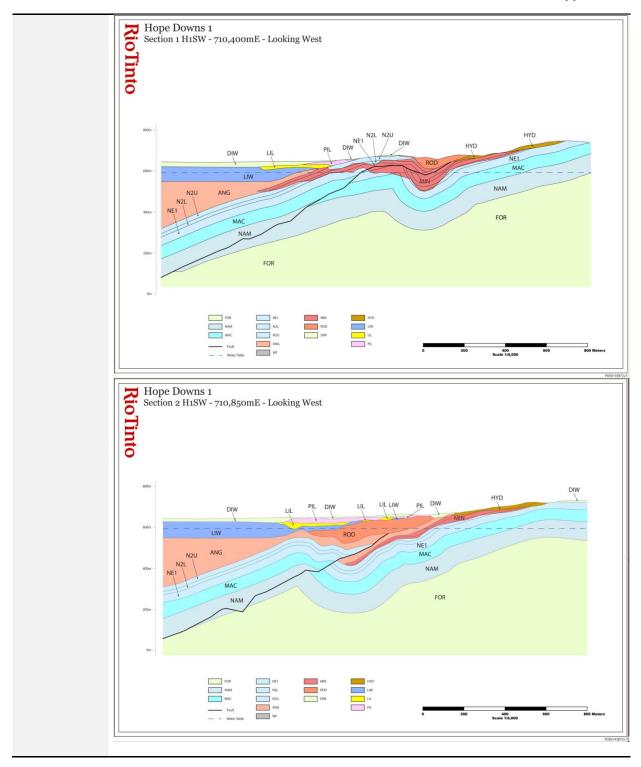
#### Appendix 1



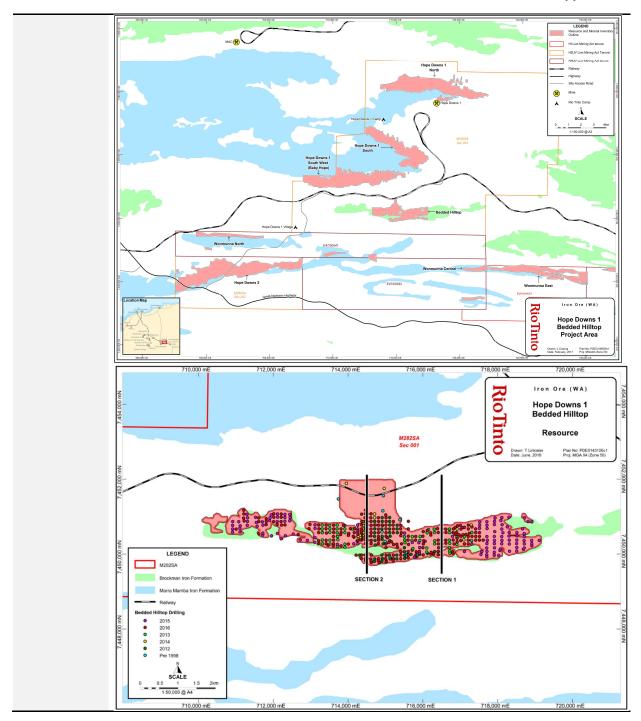


#### Appendix 1

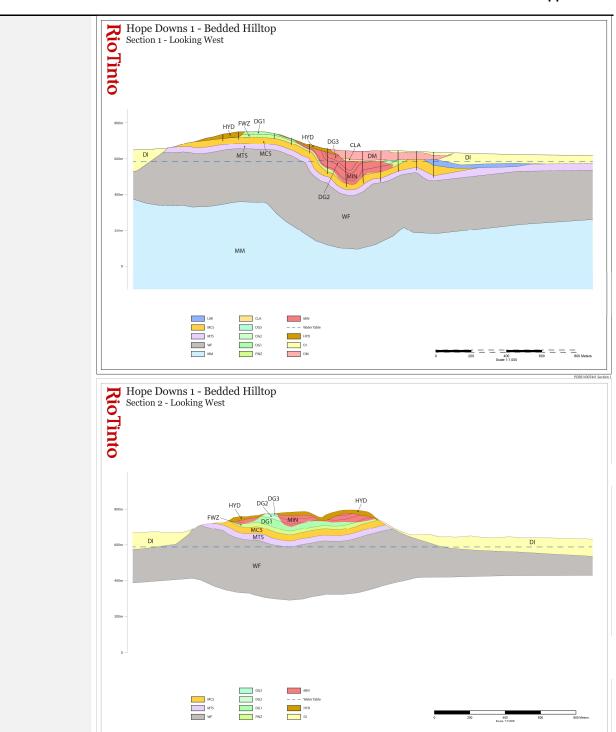




#### Appendix 1



PDE0143074v1 Sect



# Balanced reporting • Not applicable as Rio Tinto Ltd. has not released exploration results for this deposit. Other substantive exploration data • Detailed geological surface mapping has been collected across the Hope Downs 1 area in 2006, at 1:6,000 scale and in 2008 at 1:5,000 scale. The mapping was revisited in 2013 and validated. Deposit Specific Statements Hope Downs 1 North

Metallurgical test work was carried out on 24 diamond holes that were drilled as part of the

#### 2005, 2006 and 2007 campaigns.

• Bulk samples have been obtained via the excavation of winzes and adits.

#### **Hope Downs 1 South West**

 Metallurgical test work was carried out on 31 diamond holes that were collected as part of the 2013 drill program, an additional 8 diamond holes were collected as part of the 2014 drill program.

#### Hope Downs 1 Bedded Hilltop

 Metallurgical test work has been carried out of 3 diamond holes that were collected as part of the 2015 drill program.

#### Further work

#### **Deposit Specific Statements**

#### Hope Downs 1 North

• Further reverse circulation drilling is planned to test the eastern extension of the deposit on a variable grid pattern ranging from a planned 200 m x 50 m down to final infill spacing of 50 m x 50 m.

#### **Hope Downs 1 South West**

• Further infill reverse circulation drilling is planned for the deposit to a planned spacing of 50 m  $\times$  50 m.

#### Hope Downs 1 Bedded Hilltop

• Further infill reverse circulation drilling is planned to achieve first a 100 m x 100 m drilling grid and then finally a drilling grid at 50 m x 50 m spacing.

#### SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
Database integrity	<ul> <li>All drilling data is securely stored in an acQuire™ geoscientific information management system managed by a dedicated team within Rio Tinto Iron Ore. The system is backed up nightly on servers located in Perth, Western Australia. The backup system was tested in May 2016, demonstrating that the system is effective.</li> <li>The import/exporting process requires limited keyboard transcription and has multiple built in safeguards to ensure information is not overwritten or deleted. These include:         <ul> <li>Data is imported and exported through automated interfaces, with limited manual input;</li> <li>Inbuilt validation checks ensure errors are identified prior to import;</li> <li>Once within the acQuire™ database, editing is very limited and warning messages ensure accidental changes are not made;</li> <li>Audit trail records updates and deletions should an anomaly be identified;</li> <li>Export interface ensures the correct tables, fields and format are selected.</li> </ul> </li> <li>The drill hole database used for Mineral Resource estimation has been internally validated. Methods include checking:         <ul> <li>acQuire™ scripts for relational integrity, duplicates, total assay and missing / blank assay values;</li> <li>Grade ranges in each domain;</li> <li>Domain names and tags;</li> <li>Survey data down-hole consistency;</li> <li>Null and negative grade values;</li> <li>Missing or overlapping intervals;</li> <li>Duplicate data.</li> </ul> </li> <li>Drill hole data is also validated visually by domain and compared to the geological model.</li> </ul>
Site visits	General Statements  The Competent Person visited Hope Downs 1 in 2016. There were no outcomes as a result of these visits.
Geological interpretation	<ul> <li>Overall the Competent Person's confidence in the geological interpretation of the area is good, based on the quantity and quality of data available, and the continuity and nature of the mineralisation.</li> <li>Geological modelling was performed by Rio Tinto Iron Ore geologists. The method involves interpretation of stratigraphy using surface geological mapping, lithological logging data, down-hole gamma data, and assay data.</li> <li>Cross-sectional interpretation of each stratigraphic unit is performed followed by interpretation of mineralisation boundaries. Three-dimensional wireframes of the sectional interpretations are created to produce the geological model.</li> <li>Mineralisation is continuous. It is affected by stratigraphy, structure and weathering. The drill hole spacing is sufficient to capture density, grade and geology variation for Mineral Resource reporting.</li> <li>The geological model is sub-divided into domains and both the composites and model blocks are coded with these domains.</li> </ul>
Dimensions	Deposit Specific Statements
	<ul> <li>Hope Downs 1 North         <ul> <li>Hope Downs 1 North strikes approximately east/west with an along strike extent of approximately 8.5 km and a width of up to 1.1 km. The mineralisation extends from surface to a depth of 300 m.</li> </ul> </li> <li>Hope Downs 1 South West         <ul> <li>Hope Downs 1 South West strikes east/west for approximately 8 km and has a width of approximately 1.5 km, with a moderate dip of 20-30 degrees to the south. The mineralisation</li> </ul> </li> </ul>
	extends from surface to a depth of 300 m.  Hope Downs 1 Bedded Hilltop

•	Hope Downs 1 Bedded Hilltop strikes east/west for approximately 9 km and has a width of
	approximately 1.4 km. The mineralisation extends from surface to a depth of 260 m.

# Estimation and modelling techniques

#### General Statements

- Ten grade attributes (Fe, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, P, Mn, LOI, S, TiO<sub>2</sub>, MgO, and CaO), and density were estimated for input into Mine Planning and Marketing assessments.
- The grade estimation process was completed using Maptek™ Vulcan™ software.
- Statistical analysis was carried out on data from all domains.
- All domains were estimated with hard boundaries applied.
- The block model was validated using a combination of visual, statistical, and multivariate global change of support techniques.

#### **Deposit Specific Statements**

#### Hope Downs 1 North

- The majority of the mineralised domains were estimated by ordinary kriging and non-mineralised domains were estimated using inverse distance to the power of 2.
- A block size of 25 m (X) × 25 m (Y) × 5 m (Z) was used for parent blocks. Parent blocks are sub-celled to the geological boundaries to preserve volume.
- A 'high yield limit' or grade dependent restriction on a sample's range of influence was used for Mn, MgO, S, TiO<sub>2</sub>, SiO<sub>2</sub> and CaO for the mineralised domains. The limits differed for different domains and were selected based on histograms and the spatial distribution of the respective assay values.
- Grades were extrapolated to a maximum distance of approximately 400 m from data points.
- Additional validation involved the comparison of the block model against production data via reconciliation.

#### **Hope Downs 1 South West**

- The majority of the mineralised domains were estimated by ordinary kriging and non-mineralised domains were estimated using inverse distance to the power of 1. These methods are deemed appropriate by the Competent Person for estimating the tonnes and grade of the reported Mineral Resources.
- A block size of  $25 \text{ m}(X) \times 25 \text{ m}(Y) \times 10 \text{ m}(Z)$  was used for parent blocks. Parent blocks are sub-celled to the geological boundaries to preserve volume.
- A 'high yield limit' or grade dependent restriction on a sample's range of influence was used for Mn, SiO<sub>2</sub>, S and CaO for the mineralised domains and S for the waste domains. The limits differed for different domains and were selected based on histograms and the spatial distribution of the respective assay values.
- Grades are extrapolated to a maximum distance of approximately 650 m from data points.

#### Hope Downs 1 Bedded Hilltop

- The majority of the mineralised domains were estimated using ordinary kriging and non-mineralised domains were estimated using inverse distance to the power of 1.
- A block size of 100 m (X) × 50 m (Y) × 5 m (Z) was used for parent blocks. Parent blocks are sub-celled to the geological boundaries to preserve volume.
- A 'high yield limit' or grade dependent restriction on a sample's range of influence was used for Mn, TiO<sub>2</sub>, and CaO for the mineralised domains. The limits differed for different domains and were selected based on histograms and the spatial distribution of the respective assay values.
- Grades are extrapolated to a maximum distance of approximately 600 m from data points.

#### Moisture

#### **General Statements**

• All Mineral Resource tonnages are estimated and reported on a dry basis.

# Cut-off parameters

#### **Deposit Specific Statements**

#### Hope Downs 1 North

• The cut-off for high grade ore is greater than or equal to 57% Fe.

#### **Hope Downs 1 South West**

• The cut-off for high grade ore is greater than or equal to 58% Fe.

#### Hope Downs 1 Bedded Hilltop

- The cut-off for high grade ore is greater than or equal to 60% Fe.
- The cut-off for Brockman Process Ore is material 50% ≤ Fe < 60% and ≥ 3% Al<sub>2</sub>O<sub>3</sub> < 6% (geology domain must be Dales Gorge, Joffre or Footwall Zone).

## Mining factors or assumptions

#### **Deposit Specific Statements**

#### Hope Downs 1 North

- Development of additional Mineral Resource at this existing mine site assumes mining using similar methods to those currently employed. The current mining method is conventional truck and shovel, open pit mining at appropriate bench heights. Current mining practices include grade control utilising blast hole data.
- Ore from Hope Downs 1 North is blended with ore from other Rio Tinto Iron Ore mine sites to produce the Pilbara Blend product.
- Spatial mapping of problematic material types was performed to assist in scheduling of material through the plant in order to maximise plant performance.

#### Hope Downs 1 South West

- Development of this Mineral Resource assumes mining using standard Rio Tinto Iron Ore equipment and methods similar to other Rio Tinto Iron Ore operations. The assumed mining method is conventional truck and shovel, open pit mining at an appropriate bench height. Mining practices will include grade control utilising blast hole data.
- It is planned to blend ore from Hope Downs 1 South West with ore from other Rio Tinto Iron Ore mine sites to make a saleable ore product. This plan is in line with current Rio Tinto Iron Ore practices where ore from multiple mines is combined to produce the Pilbara Blend product.

#### Hope Downs 1 Bedded Hilltop

- Development of this Mineral Resource assumes mining using standard Rio Tinto Iron Ore
  equipment and methods similar to other Rio Tinto Iron Ore operations. The assumed mining
  method is conventional truck and shovel, open pit mining at an appropriate bench height.
  Mining practices will include grade control utilising blast hole data.
- It is planned to blend ore from Hope Downs 1 Bedded Hilltop with ore from other Rio Tinto Iron Ore mine sites to make a saleable ore product. This plan is in line with current Rio Tinto Iron Ore practices where ore from multiple mines is combined to produce the Pilbara Blend product.

# Metallurgical factors or assumptions

#### **Deposit Specific Statements**

#### Hope Downs 1 North

 Development of additional Mineral Resources at this mine site assumes that standard crushing and screening processes used by Rio Tinto Iron Ore will be applicable.

#### Hope Downs 1 South West

- It is assumed that standard crushing and screening processes used by Rio Tinto Iron Ore will be applicable for the processing of Hope Downs 1 South West.
- Further work has also been completed to better predict the spatial variability of problematic ore types for processing.

#### Hope Downs 1 Bedded Hilltop

 It is assumed that standard crushing and screening processes used by Rio Tinto Iron Ore will be applicable for the processing of Hope Downs 1 Bedded Hilltop.

# Environmental factors or assumptions

#### **Deposit Specific Statements**

#### Hope Downs 1 North

- Rio Tinto Iron Ore has an extensive environmental and heritage approval process. There are no issues that impact on the Mineral Resource estimate.
- The S estimate, in conjunction with the mapping of oxidised shales, black carbonaceous shales, lignite and pyrite, and the location of the water table, is used in prediction and planning for the treatment of potential environmental impacts. This process is in accordance with Rio Tinto's Mineral Waste Management and Acid Rock Drainage (ARD) Control Environmental Standards.

#### Hope Downs 1 South West

- Rio Tinto Iron Ore has an extensive environmental and heritage approval process. A review of these requirements was undertaken as part of a recent Feasibility Study. No issues were identified that would impact on the Mineral Resource estimate.
- The S estimate, in conjunction with the mapping of oxidised shales, black carbonaceous shales, lignite and pyrite, and the location of the water table, is used in prediction and planning for the treatment of potential environmental impacts. This process is in accordance

with Rio Tinto's Mineral Waste Management and Acid Rock Drainage (ARD) Control Environmental Standards.

#### Hope Downs 1 Bedded Hilltop

 Rio Tinto Iron Ore has an extensive environmental and heritage approval process. A detailed review of these requirements is being undertaken as part of the current Order of Magnitude Study. No issues were identified that would impact on the Mineral Resource estimate.

#### **Bulk density**

#### **Deposit Specific Statements**

#### Hope Downs 1 North

- Dry bulk density is derived from accepted gamma-density data collected at 10 cm intervals from down-hole geophysical sondes. Accepted gamma-density data is corrected for moisture using diamond drill core specifically drilled throughout the deposit.
- Dry core densities are generated via the following process:
  - The core volume is measured in the split and the mass of the core is measured and recorded.
  - Wet core densities are calculated by the split and by the tray.
  - o Core recovery is recorded.
  - o The core is then dried and dry core masses are measured and recorded.
  - o Dry core densities are then calculated.
- Accepted gamma-density values were estimated using ordinary kriging in mineralised zones and inverse distance weighted to the second power in waste zones.
- Estimated gamma-density values were corrected for moisture using diamond drill core twinned with reverse circulation drilling.

#### **Hope Downs 1 South West**

- Dry bulk density is derived from accepted gamma-density data collected at 10 cm intervals from down-hole geophysical sondes. Accepted gamma-density data is corrected for moisture using diamond drill core specifically drilled throughout the deposit.
- Dry core densities are generated via the following process:
  - The core volume is measured in the split and the mass of the core is measured and recorded.
  - Wet core densities are calculated by the split and by the tray.
  - o Core recovery is recorded.
  - The core is then dried and dry core masses are measured and recorded.
  - Dry core densities are then calculated.
- Accepted gamma-density values were estimated using ordinary kriging in mineralised zones and inverse distance weighted to the second power in waste zones.
- Estimated gamma-density values were corrected for moisture using diamond drill core twinned with reverse circulation drilling.

#### Hope Downs 1 Bedded Hilltop

- Density was scripted using strand averages from Rio Tinto Iron Ore All Pilbara dry core density data.
- No dry core density data is available for dry bulk density analysis.

#### Classification

#### **Deposit Specific Statements**

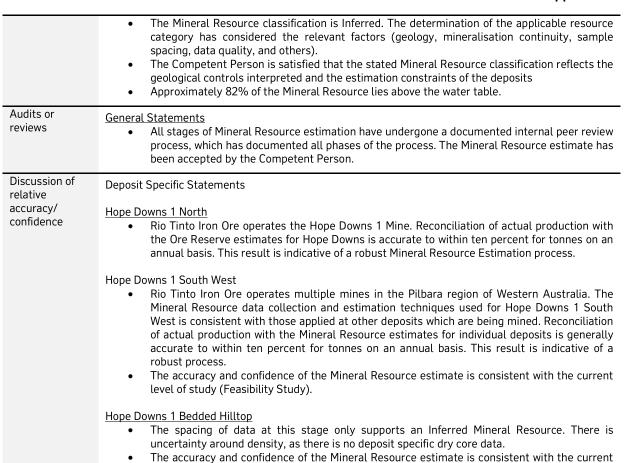
#### Hope Downs 1 North

- The Mineral Resource has been classified into the categories of Measured, Indicated and Inferred. The determination of the applicable resource category has considered the relevant factors (geology, mineralisation continuity, sample spacing, data quality, and others).
- The Competent Person is satisfied that the stated Mineral Resource classification reflects the relevant factors of the deposit.
- Approximately 5% of the Mineral Resource lies above the water table.

#### Hope Downs 1 South West

- The Mineral Resource classification is Measured, Indicated and Inferred. The determination of the applicable resource category has considered the relevant factors (geology, mineralisation continuity, sample spacing, data quality, and others).
- The Competent Person is satisfied that the stated Mineral Resource classification reflects the geological controls interpreted and the estimation constraints of the deposits.
- Approximately 72% of the Mineral Resource lies above the water table.

#### Hope Downs 1 Bedded Hilltop



level of study (Order of Magnitude Study).

#### SECTION 4 ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
Mineral Resource estimate for conversion to Ore Reserves	<ul> <li>Deposit Specific Statements</li> <li>Hope Downs 1 North         <ul> <li>The declared Ore Reserves are for the Hope Downs 1 North deposit.</li> <li>The modifying factors for this Ore Reserve estimate were based on a Mineral Resource estimate completed in October 2015.</li> <li>The most recent Mineral Resource estimate together with the latest update of pit designs were used for reporting Ore Reserves.</li> <li>Mineral Resources are reported in addition to Ore Reserves.</li> </ul> </li> <li>Hope Downs 1 South West         <ul> <li>The declared Ore Reserves are for the Hope Downs 1 South West deposit.</li> <li>The modifying factors for this Ore Reserve estimate were applied to a Mineral Resource estimate completed in July 2015.</li> <li>Mineral Resources are reported additional to Ore Reserves.</li> </ul> </li> </ul>
Site visits	<ul> <li>General Statements</li> <li>The Competent Person visited Hope Downs 1 in 2012.</li> </ul>
Study status	Deposit Specific Statements  Hope Downs 1 North  • Hope Downs 1 North is an existing operation.  Hope Downs 1 South West  • A Feasibility Study was completed in January 2016.
Cut-off parameters	Deposit Specific Statements  Hope Downs 1 North  • The cut-off grade for high-grade Marra Mamba ore is greater than or equal to 57% Fe.  Hope Downs 1 South West  • The cut-off grade for high-grade Marra Mamba ore is greater than or equal to 58% Fe.
Mining factors or assumptions	<ul> <li>General Statements</li> <li>Pit optimisations utilising the Lerchs-Grossmann algorithm with industry standard software were undertaken. This optimisation utilised the regularised Mineral Resource model together with cost, revenue, and geotechnical inputs. The resultant pit shells were used to develop detailed pit designs with due consideration of geotechnical, geometric and access constraints. These pit designs were used as the basis for production scheduling and economic evaluation.</li> <li>During the above process, Inferred Mineral Resources were excluded from mine schedules and economic valuations utilised to validate the economic viability of the Ore Reserves.</li> <li>Conventional mining methods (truck and shovel) similar to other Rio Tinto Iron Ore operating mines are applied.</li> <li>Metallurgical models were applied to the regularised model in order to model products tonnage, grades and yields.</li> </ul>
	<ul> <li>Deposit Specific Statements</li> <li>Hope Downs 1 North         <ul> <li>The Mineral Resource model was regularised to a block size of 25 m (X) × 12.5 m (Y) × 10 m (Z), which was determined to be the selective mining unit following an analysis of a range of selective mining units. Dilution and mining recovery were modelled by applying the regularisation process to the sub-block geological model.</li> <li>The geotechnical parameters have been applied based on geotechnical studies informed by assessments of 70 drill holes drilled during the 2006, 2008, 2009, 2010, 2011 &amp; 2013 drilling programmes, specifically drilled for geotechnical purposes on the surrounding host rock. The resultant inter-ramp slope angles vary between 26 and 48 degrees depending on the local</li> </ul> </li> </ul>
	rock mass and structural geological conditions.  Hope Downs 1 South West

#### Criteria Commentary

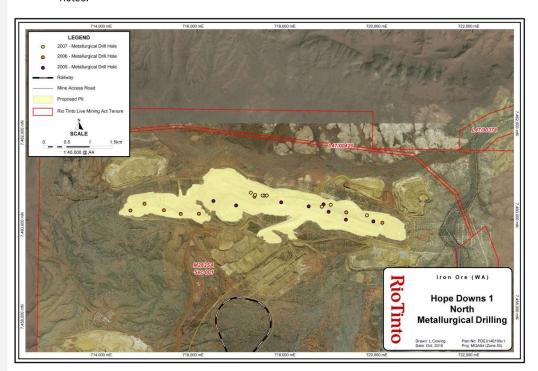
- The Mineral Resource model was regularised to a block size of 25 m (X)  $\times$  12.5 m (Y)  $\times$  5 m (Z) which was determined to be the selective mining unit following an analysis of a range of selective mining units. Dilution and mining recovery were modelled by applying the regularisation process to the sub-block geological model.
- The geotechnical parameters have been applied based on geotechnical studies informed by assessments of 31 drill holes drilled during the 2014 drilling programme, specifically drilled for geotechnical purposes on the surrounding host rock. The resultant inter-ramp slope angles vary between 9 and 29 degrees depending on the local rock mass, structural geology, and hydrogeological conditions.
- The infrastructure will be shared with the existing Hope Downs 1 operations.

# Metallurgical factors or assumptions

#### **Deposit Specific Statements**

#### Hope Downs 1 North

- Hope Downs 1 North ore is processed through the Hope Downs 1 dry crushing and screening plant. Product prediction regressions for dry processing routes are assigned to the designated domains assuming a nominal 6.3mm separation cut size between lump and fines products, based on the most appropriate available metallurgical data generated from PQ core and production data. The regressions were last updated in Q3 2016.
- The Hope Downs 1 North ore is typically blended with Hope Downs 1 South ore to maximise throughput through the Hope Downs 1 dry crushing and screening plant.
- During drill campaigns from 2005 to 2007 a total of 2,810m of metallurgical diamond drill
  core was drilled across the deposit. Data obtained from this core formed the basis for the
  metallurgical test work, which informed the operation for the suitability of the Hope Downs 1
  processing facility and product prediction. The map below shows the location of these drill
  holes.



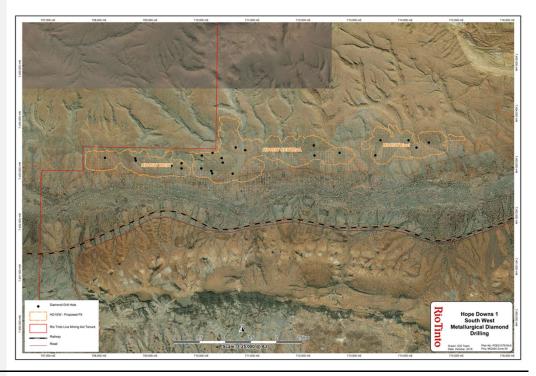
#### **Hope Downs 1 South West**

- Hope Downs 1 South West ore will be processed through Hope Downs 1 dry crushing and screening plant. Product prediction regressions for dry processing routes are assigned to the designated domains, based on the most appropriate available metallurgical data generated from PQ core and production data.
- The proposed metallurgical process is a well-tested and proven processing methodology, having been utilised at Rio Tinto Iron Ore mining operations for decades.
- During drill campaigns in 2013 and 2014 a total of 1,265m of metallurgical diamond drill core
  was drilled in the west, central and east deposits. Data obtained from this core formed the
  basis for the metallurgical test work, which informed the study for the suitability of the Hope
  Downs 1 processing facility and the metallurgical models. The map below shows the location
  of these drill holes.

Criteria

Commentary

 The diamond drill core test results were utilised to develop metallurgical models representing different metallurgical domains, which were considered representative of the ore body. The metallurgical models predict product tonnage and grade parameters for lump and fines products.



#### Environmental

#### **Deposit Specific Statements**

#### Hope Downs 1 North

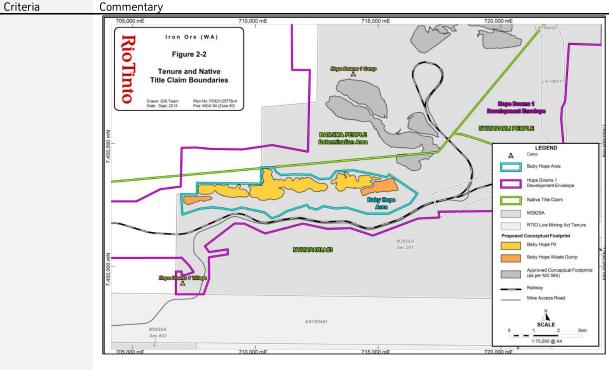
- The Hope Downs 1 Proposal was referred to the Western Australian Environmental Protection Authority (EPA) in 2000 and was assessed at a Public Environmental Review (PER) level of assessment under Part IV of the Environmental Protection Act 1986 (WA). The Proposal included above and below water table mining of Hope Downs 1 north and south pits, supporting infrastructure, rail spur and management of surplus water from dewatering.
- The Minister for Environment authorised the Hope Downs 1 Project on 1 February 2002 via Ministerial Statement 584 (MS 584). Several minor changes to MS 584 have been authorised under subsequent s45C applications in 2005, 2006, 2009, 2010, 2012, and 2013. MS 893 was issued as an amendment to MS 584 in 2012 which included a new environmental condition relating to supplementation discharge to Weeli Wolli Spring.
- Assessment of the potential for impacts on matters of National Environmental Significance (MNES) did not trigger a requirement to refer the proposed development of Hope Downs 1.
- A geochemical risk assessment has been completed for the project. The assessment
  encompasses all material types present at the site, and tests have been conducted in
  accordance with industry standards. Mining operations at the project pose a high Acid and
  Metalliferous Drainage (AMD) risk based on current pit designs and the assessment of
  samples from within the pit locations. Subsequent studies have been completed to evaluate
  the most appropriate location and methods to store high risk material and minimise AMD
  potential.

#### Hope Downs 1 South West

- The Hope Downs 1 South West Proposal was referred to the Western Australian Environmental Protection Authority (EPA) in June 2014 and was Assessed on Proponent Information (API) under Part IV of the Environmental Protection Act 1986 (WA). The Proposal included above water table mining of three pits to sustain production at Hope Downs 1.
- The Minister for Environment authorised the Hope Downs 1 South West Project on 24
  December 2015 via Ministerial Statement 1025 (MS 1025) as an amendment to MS 584 for
  the Hope Downs 1 Project.
- Assessment of the potential for impacts on matters of National Environmental Significance (MNES) did not trigger a requirement to refer the proposed development of Hope Downs 1 South West.

	<ul> <li>A geochemical risk assessment has been completed for the project. The assessment encompasses all material types present at the site, and tests have been conducted in accordance with industry standards. Mining operations at the project pose a low acid mine drainage risk based on current pit designs and the assessment of samples from within the pit locations.</li> </ul>
Infrastructure	Deposit Specific Statements
	Hope Downs 1 North  Hope Downs 1 North utilises existing facilities.
	<ul> <li>Hope Downs 1 South West</li> <li>Access to the site during construction will be from the Great Northern Highway and then along the Hope Downs Mine Access Road.</li> <li>Fly-in, Fly-out (FIFO) personnel access will fly in to West Angelas Airport and be brought to site by bus.</li> <li>Designs for buildings, workshops and related facilities proposed for the Hope Downs 1 South West project have been modelled on existing Rio Tinto Iron Ore facilities, with modifications for safety, capital and operating efficiency.</li> <li>A central hub for all production support facilities will be located immediately to the south of Central Pit.</li> <li>The Existing Hope Downs 1 Explosive Facility will be utilised for the storage of explosives for the Hope Downs 1 South West operations.</li> <li>Electric power will be supplied by generators and additional communications infrastructure will be required to provide adequate communications to the mine area.</li> <li>Water will be sourced from bores located to the south and the east of the deposit. These bores will support construction and operations.</li> <li>Ore will be railed to Rio Tinto's ports at Dampier and Cape Lambert. The existing port and railway networks will have sufficient capacity to accommodate ore supply from Hope Downs 1 South West.</li> </ul>
Costs	<ul> <li>General Statements</li> <li>Operating costs were benchmarked against similar operating Rio Tinto Iron Ore mine sites.</li> <li>Exchange rates were forecast by analysing and forecasting macro-economic trends in the Australian and World economy.</li> <li>Transportation costs were based on existing operating experience at Rio Tinto Iron Ore mine sites in the Pilbara, Western Australia.</li> <li>Allowances have been made for royalties to the Western Australian government and other private stakeholders.</li> </ul>
	Deposit Specific Statements
	<ul> <li>Hope Downs 1 South West</li> <li>The capital costs are based on a Feasibility Study utilising experience from the construction of existing similar Rio Tinto Iron Ore projects in the Pilbara, Western Australia.</li> </ul>
Revenue factors	Rio Tinto applies a common process to the generation of commodity prices across the group.     This involves generation of long-term price curves based on current sales contracts, industry capacity analysis, global commodity consumption and economic growth trends. In this process, a price curve rather than a single price point is used to develop estimates of mine returns over the life of the project. The detail of this process and of the price point curves is commercially sensitive and is not disclosed.
Market assessment	<ul> <li>General Statements</li> <li>Blending of iron ore from Brockman and Marra Mamba sources results in a high Fe product, whilst reducing both the average values, and variability, of SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, and P. This product attracts a market premium and accounts for annual sales in excess of 150 Mt/a.</li> <li>The supply and demand situation for iron ore is affected by a wide range of factors, and as iron and steel consumption changes with economic development and circumstances. Rio Tinto Iron Ore delivers products aligned with its Mineral Resources and Ore Reserves; these products have changed over time and have successfully competed with iron ore products supplied by other companies.</li> </ul>

Cuitania	Caramantam
Criteria	Commentary
	<ul> <li>Hope Downs 1 North         <ul> <li>Ore from Hope Downs 1 North is blended with ore from other Rio Tinto Iron Ore mine sites to make a saleable ore product. Hope Downs 1 North ore is not marketed directly.</li> </ul> </li> <li>Hope Downs 1 South West         <ul> <li>It is planned to blend ore from Hope Downs 1 South West with ore from other Rio Tinto Iron Ore mine sites to make a saleable ore product. Hope Downs 1 South West ore will not be marketed directly. This plan is in line with current Rio Tinto Iron Ore practices where ore from multiple mines is combined to produce the Pilbara Blend product.</li> </ul> </li> </ul>
Economic	<ul> <li>General Statements</li> <li>Economic inputs such as foreign exchange rates, carbon pricing, and inflation rates are also generated internally at Rio Tinto. The detail of this process is commercially sensitive and is not disclosed.</li> <li>Sensitivity testing of the Ore Reserves using both Rio Tinto long-term prices and a range of published benchmark prices demonstrates a positive net present value for the project sufficient to meet Rio Tinto Ltd investment criteria.</li> </ul>
Social	<ul> <li>Deposit Specific Statements</li> <li>Hope Downs 1 North</li> <li>The Hope Downs 1 North deposits are located within existing Mining Lease M282SA Section 001 (M282SA Sec 001), which was granted under the Iron Ore (Hope Downs) Agreement Act 1992.</li> <li>The Hope Downs 1 North mine and proposed associated infrastructure falls within the area of the Banjima group's native title claim.</li> <li>The Hope Downs 1 North project is located in the Hamersley Range, which has rich history of Aboriginal occupation. Ethnographic and archaeological surveys of the area have been completed, and all known heritage sites have been located, recorded and considered during mine planning and engineering activities.</li> <li>Rio Tinto Iron Ore has undertaken environmental surveys across the project area to support the development of Hope Downs 1 North deposit including flora and vegetation and vertebrate fauna surveys, troglofauna sampling and an assessment of bat colonies and aquatic habitats.</li> <li>A number of native vegetation clearing permits have been granted by the Western Australian Department of Mines and Petroleum (DMP) to allow the development of Hope Downs 1 North project.</li> <li>The Hope Downs 1 North deposits and associated infrastructure is located within the Shire of East Pilbara. Rio Tinto Iron Ore has established engagement frameworks with the Shire of East Pilbara, which include scheduled meetings and project updates.</li> <li>Hope Downs 1 South West</li> <li>The Hope Downs 1 South West deposits are located within existing Mining Lease M282SA Section 001 (ML282SA Sec 001), which was granted under the Iron Ore (Hope Downs) Agreement Act 1992.</li> <li>The Hope Downs 1 South West mine and proposed associated infrastructure falls within the area of the Nyiyaparli group's native title claim. There is a very small portion of the proposed development envelope that crosses into the Banjima group's native title claim. See map below.</li> </ul>



- The project is located in the Hamersley Range, which has rich history of Aboriginal occupation. Ethnographic and archaeological surveys of the area have been completed, and all known heritage sites have been located, recorded and considered during mine planning and engineering activities. Relevant approvals will be sought for any heritage sites that will be impacted by the development of the Hope Downs 1 South West deposit.
- Rio Tinto Iron Ore has undertaken environmental surveys across the project area to support the development of the project including flora and vegetation and vertebrate fauna surveys, troglofauna sampling and an assessment of bat colonies and aquatic habitats.
- A number of native vegetation clearing permits have been granted by the Western Australian
  Department of Mines and Petroleum (DMP) to allow for preliminary works such as
  sterilisation drilling, geotechnical investigations, mineral exploration, a construction camp,
  and associated activities.
- The Hope Downs 1 South West deposit and associated infrastructure is located within the Shire of East Pilbara. Rio Tinto Iron Ore has established engagement frameworks with the Shire of East Pilbara, which includes scheduled meetings and project updates.

#### Other

#### **General Statements**

Semi-quantitative risk assessments have been undertaken throughout the applicable study
phases, no material naturally occurring risks have been identified through the above
mentioned risk management processes.

#### Classification

#### **Deposit Specific Statements**

#### Hope Downs 1 North

- The Ore Reserves consist of 83% Proved Reserves and 17% Probable Reserves.
- The Competent Person is satisfied that the stated Ore Reserve classification reflects the outcome of technical and economic studies.

#### Hope Downs 1 South West

- The Ore Reserves consist of 51% Proved Reserves and 49% Probable Reserves.
- The Competent Person is satisfied that the stated Ore Reserve classification reflects the outcome of technical and economic studies.

## Audits or reviews

#### **General Statements**

- No external audits have been performed.
- Internal Rio Tinto Iron Ore peer review processes and internal Rio Tinto technical reviews have been completed. These reviews concluded that the fundamental data collection techniques are appropriate.

Criteria	Commentary
Discussion of relative	Deposit Specific Statements
accuracy/ confidence	Rio Tinto Iron Ore operates multiple mines in the Pilbara region of Western Australia. The Ore Reserve estimation techniques utilised for the Hope Downs 1 North deposit are consistent with those applied at the existing operations. Reconciliation of actual production with the Ore Reserve estimate for individual deposits is generally within 10 percent for tonnes on an annual basis. This result is indicative of a robust Ore Reserve estimation process.
	<ul> <li>Hope Downs 1 South West</li> <li>Rio Tinto Iron Ore operates multiple mines in the Pilbara region of Western Australia. The Ore Reserve estimation techniques utilised for the Hope Downs 1 South West deposit are consistent with those applied at the existing operations. Reconciliation of actual production with the Ore Reserve estimate for individual deposits is generally within 10 percent for tonnes on an annual basis. This result is indicative of a robust Ore Reserve estimation process.</li> <li>Accuracy and confidence of modifying factors are generally consistent with the current level of study (Feasibility Study).</li> </ul>