JORC Code, 2012 Edition – Table 1 report template

COLOMI IRON ORE PROJECT – MINERAL RESOURCES ESTIMATE UPDATE

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	• The Colomi Project, comprising all of the prospects within Colomi South and Colomi North, were drill tested using a combination of diamond and reverse circulation drilling techniques. All of the samples provided by the drilling were removed from site and relocated to a purpose-built sample preparation and storage yards within the nearest local township. The Colomi North and Colomi South samples were relocated to the township of Sento Se. • In the exploration areas 152 drilling holes were conducted, totalling 19,314.80m. The average depth of the holes was 125m and the deepest hole was 250 m. The holes were arranged in 800 x 400m grid in Remanso and Jacobina deposits. In Bicuda Norte and Bicuda Sul deposits the drilling grids were 200 x 200 and 100 x 100 m due to the more irregular morphology of the itabirite bodies. In other areas "diamond" grids were used, which consist in a diamond hole in the centre of a square whose vertices were formed by reverse circulation holes. All diamond holes were undertaken in HQ (6.35 cm) diameter and the reverse circulation holes in 12.7cm diameter. In both methods, all drilled material was sampled, nothing being discarded. The holes were mostly vertical. For the inclined holes, downhole trajectory measurements were taken using a Maxibor, with readings recorded every three metres downhole. • The table below shows the exploration activities undertaken in the exploration areas. Geological mapping, rock samples, topography and geophysical survey exploratory activities and quantities included exploration on tenement 872.431/2003 (less than 10% of explored area) which has since been divested by the Company and is not included in the MRE.

Criteria	JORC Code explanation	Commentary

Activity	Unit	Quantity
Topography – topographic station	Station	37
Topography- Total station planialtimetric survey	km	451.20
Topography-polygonal control total station	km	154.55
Geological Mapping	station	2,681
Rock Samples - Chemical analyses	Sample	204
Rock Samples -chemical and petrographic	Sample	110
Geophysics - Magnetometry airborne survey	Km	4,044.00
Geophysics – Ground magnetometry	Km	224.2
Ground Geophysics-Gravimetry	km	144
Reverse Circulation Drilling	m	12180
Reverse Circulation Drilling	Holes	96
Chip Samples -chemical analyses	sample	1129
Diamond Drilling	m	7134.80
Diamond Holes	holes	56
Core samples -chemical analyses	sample	836
Core Samples density-tests	sample	1973
Samples for QA/QC-chemical analyses	sample	492
Samples for process test work	sample	7

- Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.
- Aspects of the determination of mineralization that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralization types (e.g. submarine nodules) may warrant disclosure of detailed information.

- Measures to ensure sample representativity include occasional twinning of RC drill holes with diamond drillholes, setting up of a specific sampling procedure for and by geologists, having a dedicated on site full time survey team to pick up mapping sample sites and drilling locations, assay QAQC at a second external laboratory.
- Drilling and sampling were completed by Vale S.A. (Vale). Vale employed the mining industry best practices for all sampling completed. Diamond core samples were sawn in half before being collected to allow half of the material to be sent for chemical analyses and the remaining half were filed in the core shed. The sampling was planned by the geologists and care was taken to avoid any contamination between neighbouring samples. RC chip samples were also collected by following sampling plans specified by the geologists. The samples were prepared by splitting using a Jones splitter. Initially each one metre interval was split into 2 samples of approximately 40kg each. One of them was temporary archived and used to make chip rulers and chip boxes. The other half was used for final archiving and creation of the sample intended for the chemical analysis. The sample intended for the final archiving and chemical analyses was split, generating two samples with approximately 10 kg each. One of these was duly registered with labels inside and outside the bag and filed in the core

Criteria	JORC Code explanation	Commentary
		sheds in the cities of Sento Sé and Remanso – BA. The second sample of 10 Kg was used in the composition of the sample sent for chemical analyses. • Mineralized samples (itabirites) from Bicuda Norte deposits were collected 5m intervals with minimum ≥ 3 m and a maximum <7m obeying the lithologic contacts. To ensure a clear definition of the boundaries of mineral zones, 2 m samples were also collected of the host rock in base and at the top levels of the itabirites. Core samples for granulo-chemical analysis were collected using 10m intervals as they were crushed and screened into four different size fractions and a chemical assay was obtained for each size fraction. • Samples from diamond and reverse circulation drillings conducted on all deposits (except some from Bicuda Norte), were collected using 5 m intervals with minimum ≥ 3 m and a maximum < 7 m, obeying the lithologic contacts. To ensure a clear definition of the boundaries of mineral zones, 2 m samples were also collected of the host rock in base and at the top levels of the itabirites.
Drilling techniques	• Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	• 152 Drillholes were conducted in the exploration areas, totalling 19,314.80m. • Diamond holes were undertaken in HQ (6.35 cm) diameter and the reverse circulation holes in 12.7cm diameter. • The holes were arranged in 800 x 400m grid in Remanso and Jacobina deposits. In Bicuda Norte and Bicuda Sul deposits the drilling grids were 200 x 200 to 100 x 100m due to the more irregular morphology of the itabirite bodies. In other areas "diamond" grids were used, which consist of a diamond hole in the centre of a square whose vertices were formed by reverse circulation holes.
Drill sample recovery	• Method of recording and assessing core and chip sample recoveries and results assessed.	• The diamond drilling core recovery procedure consisted of verifying the drill rod advance recorded in the core boxes and comparing to the core recovered. The measurement was undertaken using a tapeline on the core present in the boxes. For reverse circulation, the verification was undertaken by weighing of chip bags.
	• Measures taken to maximise sample recovery and ensure representative nature of the samples.	• The recovery control procedure and the recovery values were inside acceptable limits, so there is no obvious impact on the quality of the Resource Estimate. Twin hole analysis showed good correlation between recoveries and analysis of sample recovery to diamond core and RC sample weights showed no relationship to grade.
	• Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	• No relation between grade and sample recovery was detected.

Criteria	JORC Code explanation	Commentary
Logging	• Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.	• Geotechnical description was performed on all diamond holes where they were classified by geotechnical parameters W (degree of change weathering), R (degree of resistance), spacing of fractures and RQD with degree of detail to one metre. Geological description consisted of defining weathering levels, mineralogical, lithological and structural data, in all holes with detail of one metre. The author considers that the level of detail is sufficient for the reporting of Exploration Results and for Mineral Resource Estimation.
	• Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	• The logging is qualitative in nature. Logged intervals were compared to the assay data to create a litho assay category. The litho-assay is a reanalysis of the geological logging with the benefit of the assay results and is separate dataset to the lithology. Core is photographed prior to logging.
	• The total length and percentage of the relevant intersections logged.	• 100% of 152 drillholes was logged, totalling 19,314.8m
Sub-sampling techniques and sample preparation	• If core, whether cut or sawn and whether quarter, half or all cores taken. • If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry. • For all sample types, the nature, quality and appropriateness of the sample preparation technique. • Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. • Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field. • duplicate/second-half sampling. • Whether sample sizes are appropriate to the grain size of the material being sampled.	• Core samples were sawn in half to allow half of the material to be sent for chemical analysis and the remaining half were filed in the core shed. The sampling was planned by the geologists and care was taken to avoid any contamination between neighbouring samples. • Chip samples were also collected by following sampling plans specified by the geologists. The samples were prepared by splitting using a Jones splitter. Initially each one metre interval was split into 2 samples of approximately 40kg each. One of the halves was temporary archived and used to make chip rulers and chip boxes. The other half was split, generating two samples with approximately 10kg each. One of these was duly registered with labels inside and outside the bag and filed in the core sheds in the cities of Sento Sé-BA and the remaining sample of 10Kg was used in the composition of the sample sent for chemical analysis. • The physical preparation of the drilling samples was performed at the ALS Chemex Laboratory at Vespasiano – MG. The procedure included drying, primary crushing P95%<4 mm, collection of 1/8 of the sample, grinding P95 % < 0.105mm and final division with collection of one sample for whole chemical assay. • The sample sizes are considered appropriate to the style and grainsize of the mineralization at Colomi. The thickness and consistency of the intersections yield predictable grade ranges for iron and other elements.

Criteria	JORC Code explanation	Commentary
Quality of assay data and laboratory tests	• The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	• Chemical analyses were conducted in the laboratory SGS Geosol, Vespasiano-MG, while checking of 5% of the results were made in the laboratory of ALS Chemex. Sample pulps from the Reverse Circulation and Diamond Drill programs are assayed by X-Ray fluorescence for the following elements and oxides: Fe, SiO_2, P, Al_2O_3, Mn, TiO_2, CaO, MgO, BaO, K_2O, Na_2O, Cr_2O_3 and Sr. FeO and LOI were also measured. The analytes measured are considered standard for the determination of iron ore. The assay technique is considered standard within the iron ore industry. The technique is considered total.
	• For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.	• Handheld geophysical tools were not used during the initial exploration program, sample preparation & assaying was completed within external laboratories.
	• Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	• The nature of the quality control procedures was regarded as industry best practice. Both assay laboratories completed methodological and systematic standard control appropriate to international certification as standard practice. Standard and duplicate samples were inserted into samples batches sent for chemical analysis. This quality control was restricted to the elements Al_2O_3, Fe, MgO, P, Mn, SiO_2 and LOI. The quality control procedure by Vale included the following duplicates: DP1 (drilling duplicates) for every 20 samples; DP2 (crushed material duplicates), one in every 30 samples; DP3 (duplicates taken after pulverization) every 20 samples, DP4 (external check duplicates of 5% of the analyses). The average of the standards fell well within two standard deviations of the certified mean for Fe.
Verification of sampling and assaying	• The verification of significant intersections by either independent or alternative company personnel.	• GE21 approves the methodology applied by Vale in the preparation and execution of the Colomi Project QAQC Program. GE21 did not oversee the QAQC program, which was completed by Vale, but has accompanied Vale QAQC programs in other projects that used the same methodology and tends to agree with the recommendations of Vale, which concludes it's necessary to improve the QAQC program and some tools, as appropriate standard sample implementation.
	• The use of twinned holes.	• Twin hole analysis showed good correlation between recoveries and analysis of sample recovery to diamond core and RC sample weights showed no relationship to grade.
	• Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	• GE21 approves the methodology applied by Vale in the preparation and execution of the Colomi Project QAQC Program. According to GE21, results are inside acceptance limits of mineral industry.

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		• Data collection and verification and storage protocols are fully documented.
	• Discuss any adjustment to assay data.	• Adjustment to assay data was neither required nor applied.
Location of data points	• Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.	• All drillhole collars were topographically surveyed by total station surveying campaign and drillhole landmarks have been properly identified.
	• Specification of the grid system used.	• Drillholes were surveyed in the Corrego Alegre Datum. Drill holes in tenements 872.430/2003, 872.432/2003 and 872.433/2003 are in UTM zone 23S and those in tenements 872.254/2003, 872.256/2003, 872.257/2003, 872.258/2003, 872.259/2003, 872.261/2003, 872.262/2003, 872.263/2003 are in UTM zone 24S. GE21 recommends the update of the project Datum to SIRGAS2000.
	• Quality and adequacy of topographic control.	• No issue was identified by GE21 in the field or in drilling data physical archive.
Data spacing and distribution	• Data spacing for reporting of Exploration Results.	• Data spacing was acceptable to GE21 for the reporting of Exploration results. The holes were arranged in 800 x 400m grid in Remanso and Jacobina deposits. In Bicuda Norte and Bicuda Sul deposits the drilling grids were 200 x 200 and 100 x 100 m due to the more irregular morphology of the southern itabirite bodies. Diamond drillhole samples were produced at average length of 5 meters in Remanso, Jacobina and Bicuda. Some drillhole cores of Bicuda and Bicuda Norte were sampled at 10m length for granulo-chemical assay. Compositing was produced using these nominal lengths.
	• Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.	• GE21 judges that appropriate grid spacings and applied sampling and composition lengths were provided to establish the degree of geological continuity and classification reported by GE21.
	• Whether sample compositing has been applied.	• Sample compositing was applied.
Orientation of data in relation to	• Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering	• In general terms, the geological layers are sub-horizontal and the holes are vertical. Sampling was performed almost perpendicular to the layers, which is the best condition.

Criteria	JORC Code explanation	Commentary
geological structure	the deposit type. • If the relationship between the drilling orientation and the orientation of key mineralized structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	• The relationship between the drilling orientation and the orientation of key mineralized structures does not indicate sampling bias.
Sample security	• The measures taken to ensure sample security.	• GE21 approves the methodology applied by Vale in the preparation and execution of the Colomi Project QAQC Program. GE21 does not judge the values presented in the report for not having access to QAQC data sheet but has accompanied the Vale QAQC programs in other projects that used the same technique. • The core and chips were transported by the company's personnel from the drill site to the core storage facilities. Drill boxes are labelled with hole number and depth interval and the core is photographed prior to logging.
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.	• GE21 considered Vale's reports as a data source. Vale has internal audits and standard procedures. Any international standard audits were considered in resource estimation. • There has been no specific audit on sampling techniques.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

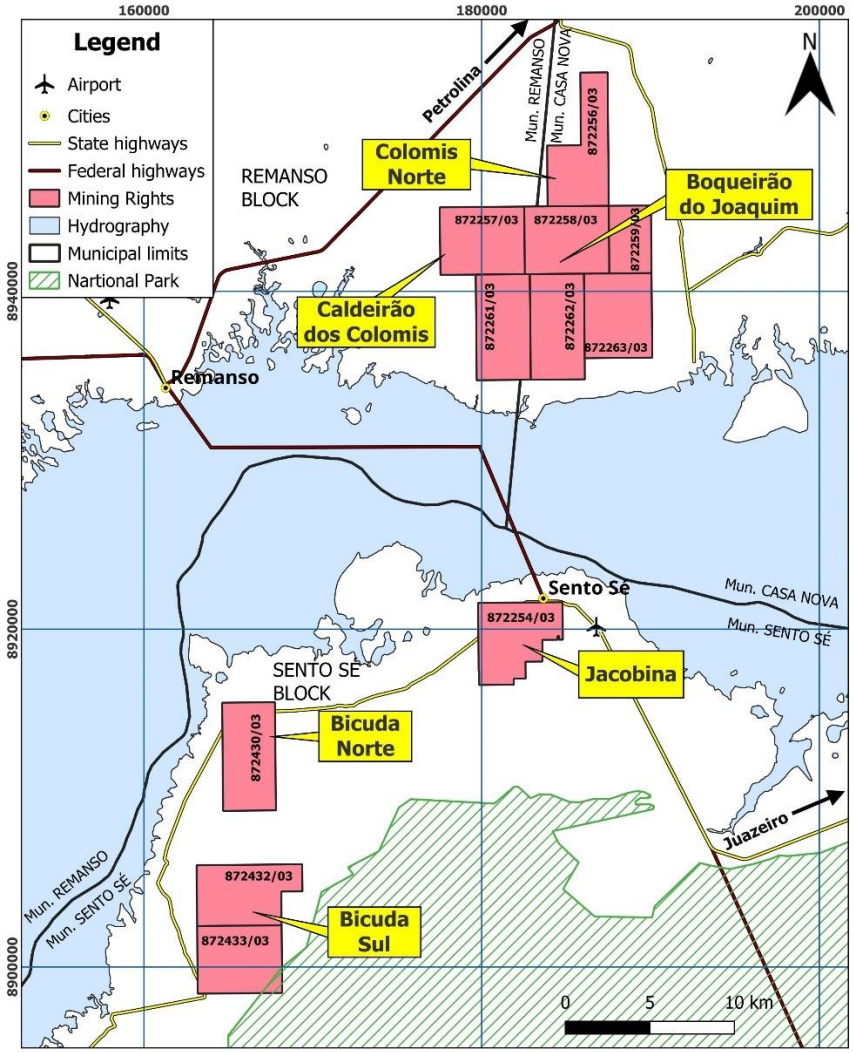
Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. • The security of the tenure held at the time of reporting along with any known impediments to obtaining a license to operate in the area.	• Colomi Singapore Pte Ltd, through its 100% owned subsidiary Colomi Iron Mineração Ltda, has the mineral rights for the tenements listed below. The Company's mineral property is considered to represent an Advanced Exploration Project which is inherently speculative in nature. However, GE21 considers the property has been acquired based on sound technical merit. The property is also considered to be sufficiently prospective in general, subject to varying exploration risk degrees, to warrant further exploration and assessment of its economic potential, it is consistent with the proposed program. • Approximately 92ha of Tenement 872.433/2003 southeast area is within the limits of Boqueirão da Onça National Park. • Other than legislated government and landowner royalties, there are no known royalty agreements in place. All tenements are in good standing and no known impediments exist. The Colomi Project is located in the municipalities of Casa Nova, Sento Sé and Remanso in northern Bahia State – Brazil. Exploration permits are listed below.

Colomi Project
Summary of tenement Status in the Colomi Project

Company	Municipality	Tenement No.	Area (Hectares)	Status
Colomi Iron Mineração Ltda	Remanso	872.256/03	1999.8	Exploration Permit
Colomi Iron Mineração Ltda	Remanso	872.257/03	2000	Exploration Permit
Colomi Iron Mineração Ltda	Remanso	872.258/03	2000	Exploration Permit
Colomi Iron Mineração Ltda	Casa Nova / Remanso	872.259/03	1000	Exploration Permit
Colomi Iron Mineração Ltda	Remanso	872.261/03	1999.3	Exploration Permit
Colomi Iron Mineração Ltda	Remanso	872.262/03	2000	Exploration Permit

Criteria	JORC Code explanation	Commentary

Colomi Iron Mineração Ltda	Casa Nova / Remanso	872.263/03	2000	Exploration Permit
Jacobina				
Colomi Iron Mineração Ltda	Sento Sé	872.254/03	1942.33	Exploration Permit
Bicuda_Norte / Bicuda_Sul				
Colomi Iron Mineração Ltda	Sento Sé	872.430/03	2000	Exploration Permit
Colomi Iron Mineração Ltda	Sento Sé	872.432/03	2000	Exploration Permit
Colomi Iron Mineração Ltda	Sento Sé	872.433/03	2000	Exploration Permit

Criteria	JORC Code explanation	Commentary
		Tenement Area Map 

Criteria	JORC Code explanation	Commentary
Exploration done by other parties	• Acknowledgment and appraisal of exploration by other parties.	• Main exploration works, including all drilling and sampling, were carried out by Vale an internationally renowned major iron ore mining company. Principal source of information for the MRE was the Final Exploration Report (FER) to ANM (Brazilian National Mining Agency). The FER provides a description and evaluation of results obtained in the exploration work carried out by Vale in the areas related to Colomi Exploration Permits.
Geology	• Deposit type, geological setting and style of mineralization.	• Geological Context: The exploration areas are located in the Archaean sialic terrains of the northern limit of the São Francisco Craton. The Craton of San Francisco is divided into two major tectono-stratigraphic segments, composed of blocks, fragments and mobile belts, limited by shear zones, of Paleoproterozoic age. At the west-northwest occurs the Sobradinho Block, which includes a metavulcanosedimentary sequences, including the Colomis Group. The structural framework of Colomis Group is defined by two major directions of lineaments, NW and NE-SW, visible in the satellite images. They represent areas of shear and fold axis directions. Deformation and metamorphic grade increase from SW to NE or (from South domain to the North domain). • Deposit Type: The iron ores can be divided in two main domains: South Domain: predominance of siliceous and dolomitic itabirites, lesser metamorphic grade, and influence of folds, faults and shear zones. The following deposits were defined in the south domain: Bicuda Norte and Bicuda Sul. North Domain: predominance of amphibolitic itabirites, metamorphic high grade and interference between the NE and NW axes folds. The following deposits were defined in the north domain: Caldeirão dos Colomis, Boqueirão do Joaquim, Colomis Norte and Jacobina deposits. • Mineralization: The mineralogical characteristics divide the discovered iron ores into four different types: Dolomitic Itabirite, Siliceous Itabirite, Amphibolitic Itabirite and Talus Deposit. Dolomitic Itabirite: Rocks composed of centimetric to decimetric bands, rhythmically alternating between laminated dolomitic marble and itabirites composed of quartz and iron oxides, with variable amounts of magnetite and haematite. Siliceous Itabirite: Rock composed of millimetric to centimetric intercalations of recrystallised quartz bands and iron oxides rich bands, with variable amounts of magnetite and haematite. Amphibolitic Itabirite: Rocks are characterized by a highly variable abundance of amphibole oriented along the metamorphic foliation and concentrated in alternating bands with quartz-rich levels and/or iron oxides. The banded structure is defined by iron composed bands of magnetite associated with quartz, and bands containing levels of amphibole. The ratio of amphibole to iron oxide/quartz varies across the deposit.

Criteria	JORC Code explanation	Commentary

Drill hole Information	• A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:
	  • easting and northing of the drill hole collar
	  • elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar
	  • dip and azimuth of the hole
	  • down hole length and interception depth.
	  • hole length.
	• If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.
		• Drill hole collars for all holes:

hole_id	X (East)	Y (North)	Z (Alt)	max_depth	azimuth	dip
COL-BICU-DH00011	823273.41	8909363.76	534.65	146.9	0	-90
COL-BICU-DH00014	824231.15	8910768.13	487.21	93	0	-90
COL-BICU-DH00015	824031.6	8910768.08	487.8	205.5	0	-90
COL-BICU-DH00018	823931.72	8910768.22	492.55	135.4	271.8	-63.29
COL-BICU-DH00020	823982.82	8910368.61	594.3	117.5	0	-90
COL-BICU-DH00025	823889.03	8909968.03	683.4	150.2	0	-90
COL-BICU-DH00026	823827.53	8910367.99	586.91	201.35	267.8	-66.02
COL-BICU-DH00027	823830.68	8911767.97	474.48	97.7	0	-90
COL-BICU-DH00028	823932.49	8911967.6	490.53	100.6	0	-90
COL-BICU-DH00029	823684.25	8909968.51	614.97	133.65	0	-90
COL-BICU-DH00030	824031.64	8911768.17	465.2	121.65	0	-90
COL-BICU-DH00031	823775.62	8911368.24	563.58	167.6	0	-90
COL-BICU-DH00032	824132.05	8911967.94	462.56	250	270.21	-64.77
COL-BICU-DH00033	823776.17	8911568.57	555.55	166.25	0	-90
COL-BICU-DH00034	824181.41	8911868.02	461.55	71.9	0	-90
COL-BICU-DH00035	823782.39	8911168.21	554.41	127.7	0	-90
COL-BICU-DH00036	823878.51	8910968.03	503.17	129.2	0	-90
COL-BICU-DH00037	823780.91	8910567.35	530.09	132.3	0	-90
COL-BICU-DH00039	823705.53	8911468.57	558.8	147	0	-90

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hole_id	X (East)	Y (North)	Z (Alt)	max_depth	azimuth	dip
COL-BICU-DH00040	823987.29	8911367.5	496.86	178.4	270.89	-64.59
COL-BICU-DH00042	823982.99	8910967.69	477.61	121.4	270.96	-63.95
COL-BICU-FD00007	823168.3	8909807.51	462.14	72.05	0	-90
COL-BINO-DH00001	824431.2	8913168.29	677.05	151.9	0	-90
COL-BINO-DH00002	824781.61	8912967.75	541.37	127.8	0	-90
COL-BINO-DH00003	824111.2	8912968.06	646.01	147.3	0	-90
COL-BINO-DH00004	824031.44	8912768.23	625.11	150.4	0	-90
COL-BINO-DH00005	824580.22	8913367.94	661.02	117.4	0	-90
COL-BINO-DH00006	824786.31	8913768.09	517.18	65.9	0	-90
COL-BINO-RC00001	824382.31	8914368.53	493.07	150	0	-90
COL-BINO-RC00002	824656.71	8912768.65	492.91	152	0	-90
COL-BINO-RC00003	824181.21	8914368.54	517.98	50	0	-90
COL-BINO-RC00004	824311.07	8912768.94	564.39	220	0	-90
COL-BINO-RC00005	824839.7	8913166.98	526.5	203	0	-90
COL-BINO-RC00006	824581.47	8913567.2	653.36	150	0	-90
COL-BINO-RC00007	823932.2	8912168.3	552.9	150	0	-90
COL-BINO-RC00008	824311.1	8912968.32	644.22	150	0	-90
COL-BISU-DH00001	823062.43	8899804.27	500.19	68	0	-90
COL-BISU-DH00002	823560.9	8901538.96	609.46	159.2	110.292	-64.95

hole_id	X (East)	Y (North)	Z (Alt)	max_depth	azimuth	Dip
COL-BISU-DH00003	825259.09	8903772.44	524.33	33	308.453	-64.849
COL-BISU-DH00004	824751.85	8903676.37	607.23	99	310.663	-64.687
COL-BISU-DH00005	825062.82	8904198.03	485.37	175	309.172	-62.683
COL-BISU-DH00006	823667.34	8901712.57	595.95	187.3	108.561	-66.113
COL-BISU-DH00007	826131.55	8905390.1	473.3	100	310.1	-65.831
COL-BISU-DH00008	826740.01	8905662.72	487.48	102	129.51	-64.49
COL-BISU-RC00001	822874.29	8899448.09	525.8	150	288.351	-70.112
COL-BISU-RC00002	823338.57	8900342.74	503.19	150	289.716	-63.297
COL-BISU-RC00003	824347.89	8902541.84	482.56	100	0	-90
COL-BISU-RC00004	824361.56	8902694.28	495.49	100	286.377	-63.594
COL-BISU-RC00005	825151.58	8903601.77	528.9	150	294.204	-63.139
COL-BISU-RC00006	824924.46	8903793.01	583.53	100	308.893	-64.771
COL-BISU-RC00007	823772.32	8901887.23	560.58	150	108.192	-59.992
COL-BISU-RC00008	824940.95	8904039.98	531.1	150	0	-90
COL-BISU-RC00009	823651.35	8901718.56	595.89	104	109.473	-66.289
COL-BISU-RC00010	824669.14	8903484.55	587.95	100	307.989	-65.222
COL-BISU-RC00011	824875.48	8903314.97	555.05	150	317.571	-63.506
COL-BISU-RC00012	823467.8	8901359.56	612.84	108	109.54	-65.033
COL-BISU-RC00013	825342.51	8903963.19	531.26	150	308.764	-63.746

Criteria	JORC Code explanation	Commentary

hole_id	X (East)	Y (North)	Z (Alt)	max_depth	azimuth	dip
COL-BISU-RC00014	824993.29	8903473.48	543.38	100	309.262	-63.593
COL-BISU-RC00015	826654.18	8905473.55	456.39	111	129.683	-62.413
COL-BISU-RC00016	822922.63	8899855.55	538.39	100	290.656	-66.694
COL-BISU-RC00017	825903.91	8905319.94	473.98	130	310.108	-64.688
COL-BISU-RC00018	823438.44	8899880.73	538.61	100	288.431	-64.989
COL-BISU-RC00019	823105.55	8900214.62	578.35	120	289.904	-62.687
COL-BISU-RC00020	826249.7	8905552.08	495.89	150	309.166	-69.106
COL-BISU-RC00021	822989.09	8900044.15	585.31	100	290.379	-64.785
COL-BISU-RC00022	822670.61	8899308.74	557.46	90	289.602	-64.398
COL-BISU-RC00023	826384.12	8905700.12	489.57	150	308.207	-63.284
COL-BISU-RC00024	825765.09	8905183.59	447.51	160	308.698	-65.217
COL-BISU-RC00025	825540.74	8904058.08	474.9	150	310.276	-64.984
COL-BISU-RC00026	825384.92	8903928.4	501.86	150	308.945	-65.025
COL-BISU-RC00027	823795.4	8901666.22	536.99	150	291.001	-64.062
COL-BISU-RC00028	822925.69	8899428.63	511.69	150	290.079	-62.709
COL-BOJO-DH00001	184741.01	8940776.52	761.31	107	0	-90
COL-BOJO-DH00002	184185.22	8941387.95	675.09	162	0	-90
COL-BOJO-RC00001	185804.77	8940104.56	668.22	150	0	-90
COL-BOJO-RC00002	185347.99	8941288.08	743.31	30	0	-90

hole_id	X (East)	Y (North)	Z (Alt)	max_depth	azimuth	dip
COL-BOJO-RC00003	184262.48	8941948.73	813.22	150	0	-90
COL-BOJO-RC00004	184827.34	8941899.47	769.79	73	0	-90
COL-BOJO-RC00005	185304.46	8940728.68	821.38	52	0	-90
COL-BOJO-RC00006	184785.35	8941340.79	813.05	150	0	-90
COL-BOJO-RC00007	184213.39	8942947.07	664.56	116	0	-90
COL-BOJO-RC00008	183447.89	8942307.54	563.95	150	0	-90
COL-BOJO-RC00009	183749.77	8942561.6	610.29	150	0	-90
COL-BOJO-RC00010	183994.07	8942248.05	703.23	150	0	-90
COL-BOJO-RC00011	183646.44	8941427	604.82	81	0	-90
COL-BOJO-RC00012	184168.9	8940822.63	630.25	150	0	-90
COL-BOJO-RC00013	185257.33	8940161.36	728.14	70	0	-90
COL-CAPI-DH00001	188528.82	8938727.73	638.57	118.8	0	-90
COL-CAPI-DH00002	187503.82	8939960.96	641.51	94.8	0	-90
COL-CAPI-DH00003	188013.64	8939343.61	782.58	90	0	-90
COL-CAPI-DH00004	187911.55	8938222.82	764.93	161.1	0	-90
COL-CAPI-DH00005	186941.63	8940596.68	830.71	150.2	0	-90
COL-CAPI-RC00001	188586.6	8939298.33	576.52	121	0	-90
COL-CAPI-RC00002	187547.24	8940523.84	622.72	150	0	-90
COL-CAPI-RC00003	188061.84	8939912.44	689.98	150	0	-90

Criteria	JORC Code explanation	Commentary

hole_id	X (East)	Y (North)	Z (Alt)	max_depth	azimuth	dip
COL-CAPI-RC00004	187507.7	8939959.87	641.91	150	0	-90
COL-CAPI-RC00005	187598.19	8941082.72	647.58	150	0	-90
COL-CAPI-RC00006	186919.71	8940009.88	755.08	101	0	-90
COL-CAPI-RC00007	187450.83	8939387.8	731.67	33	0	-90
COL-CAPI-RC00008	186369.1	8940065.16	744.52	150	0	-90
COL-CAPI-RC00009	188484.53	8938172.66	592.48	118	0	-90
COL-CAPI-RC00010	187883.56	8937670.94	639.19	100	0	-90
COL-QUEI-DH00001	188624.48	8939864.13	557.51	193.5	0	-90
COL-QUEI-DH00002	188689.31	8940952.17	640.65	150	0	-90
COL-QUEI-RC00001	188986.72	8940679.6	523.75	150	0	-90
COL-QUEI-RC00002	188675.79	8940421.18	626.53	58	0	-90
COL-QUEI-RC00003	188687.68	8940950.44	640.63	150	0	-90
COL-QUEI-RC00004	188774.99	8941552.51	508.71	150	0	-90
COL-QUEI-RC00005	188466.37	8941299.66	664.96	97	0	-90
COL-QUEI-RC00006	188459.36	8941785.51	540.66	150	0	-90
COL-TRIN-DH00001	184126.97	8940260.5	698.82	78.4	0	-90
COL-TRIN-DH00002	183655.19	8938805.79	740.95	147.4	0	-90
COL-TRIN-RC00001	183562.43	8940307.82	618.49	150	0	-90
COL-TRIN-RC00002	182743.14	8940667.46	544.78	150	0	-90

hole_id	X (East)	Y (North)	Z (Alt)	max_depth	azimuth	dip
COL-TRIN-RC00003	183380.83	8940679.36	595.38	150	0	-90
COL-TRIN-RC00004	182695.89	8940102.56	538.42	150	0	-90
COL-TRIN-RC00005	183512.51	8939748.01	563.1	150	0	-90
COL-TRIN-RC00006	184081.66	8939698.51	654.21	150	0	-90
COL-TRIN-RC00007	184638.66	8939650.18	641.72	150	0	-90
COL-TRIN-RC00008	183421.59	8938616.37	732.11	74	0	-90
COL-CALD-DH00001	183028.46	8944044.32	702.59	147.2	0	-90
COL-CALD-DH00002	183642.38	8944559.7	571.97	79.1	0	-90
COL-CALD-RC00001	183592.08	8943995.38	684.85	150	0	-90
COL-CALD-RC00002	182991.48	8943479.49	544.6	150	0	-90
COL-CALD-RC00003	183076.81	8944607.78	669.66	105	0	-90
COL-CONO-RC00001	184622.72	8947832.77	611.62	150	0	-90
COL-CONO-RC00002	185136.72	8947214.65	597.21	150	0	-90
COL-CONO-RC00003	185646.33	8946611.96	617.69	150	0	-90
COL-CONO-RC00004	184686.8	8948400.69	633.8	100	0	-90
COL-CONO-RC00005	185185.26	8947787.54	598	100	0	-90
COL-CALD-DH00003	178578.49	8942035.64	735.15	121.85	295.303	-63.271
COL-CALD-DH00004	178789.45	8942820.5	682.43	65.35	294.444	-64.069
COL-CALD-DH00005	179363.63	8944183.19	846.5	57	205.289	-64.077

Criteria	JORC Code explanation	Commentary

hole_id	X (East)	Y (North)	Z (Alt)	max_depth	azimuth	dip
COL-CALD-DH00006	181034.29	8943980.21	767.19	72.8	0	-90
COL-CALD-DH00007	180182.4	8944046.5	755.26	93.15	0	-90
COL-CALD-RC00004	178417.04	8942111.09	752.04	76	295.376	-62.699
COL-CALD-RC00005	178916.75	8942760.98	678.58	150	294.993	-64.501
COL-CALD-RC00006	179439.27	8943399.83	772.14	100	0	-90
COL-CALD-RC00007	181370.4	8943857.68	767.08	100	0	-90
COL-CALD-RC00008	180222.65	8944133.23	737.42	100	205.017	-52.246
COL-CALD-RC00009	179819.72	8944215.37	765.57	54	204.889	-59.611
COL-CALD-RC00010	179650.56	8943853.22	782.76	100	0	-90
COL-CALD-RC00011	179413.41	8944290.2	832.97	100	204.926	-59.324
COL-CALD-RC00012	179076.62	8943569.44	674.07	100	0	-90
COL-JACO-DH00001	181840.69	8918439.02	657.06	143.35	120.46	-58.89
COL-JACO-DH00002	180698.38	8917250.76	590	150.35	0	-90
COL-JACO-RC00001	181127.73	8917002.82	658.88	150	0	-90
COL-JACO-RC00002	181442.16	8917745.28	634.45	123	120.444	-58.877
COL-JACO-RC00003	181434	8917751	631.02	150	303.111	-58.796
COL-JACO-RC00004	181829.62	8918445.66	654.62	150	301.13	-59.71
COL-JACO-RC00005	182349.49	8919068.62	575.52	150	0	-90
COL-JACO-RC00006	182111.36	8919206.21	610	150	0	-90

Criteria	JORC Code explanation	Commentary

- **Selection of high-grade assays from mineralized intercepts for Bicuda Norte (40%Fe COG), Remanso and Jacobina (35%Fe COG) targets:**

hole_id	sample_id	depth_from	depth_to	Length (m)	Fe%
COL-BICU-DH00028	COL-BICU-DH00028-0001	0	10	10	55.82
COL-BICU-DH00028	COL-BICU-DH00028-0002	10	21.1	11.1	51.26
COL-BICU-DH00037	COL-BICU-DH00037-0001	0	3.4	3.4	41.00
COL-BICU-DH00037	COL-BICU-DH00037-0003	62	63.7	1.7	56.80
COL-BICU-DH00011	COL-BICU-DH00011-0002	2	6	4	41.60
COL-BICU-DH00011	COL-BICU-DH00011-0005	10	20	10	40.04
COL-BICU-DH00011	COL-BICU-DH00011-0006	20	30	10	40.03
COL-BICU-DH00011	COL-BICU-DH00011-0010	60	70	10	46.00
COL-BICU-DH00011	COL-BICU-DH00011-0011	70	80	10	47.09
COL-BICU-DH00026	COL-BICU-DH00026-0002	6.25	18.85	12.6	44.96
COL-BICU-DH00027	COL-BICU-DH00027-0001	0	3.2	3.2	40.81
COL-BINO-RC00002	COL-BINO-RC00002-0001	0	5	5	40.90
COL-BINO-RC00002	COL-BINO-RC00002-0002	5	10	5	43.62
COL-BINO-RC00002	COL-BINO-RC00002-0003	10	13	3	50.86
COL-BINO-RC00005	COL-BINO-RC00005-0014	65	71	6	41.24
COL-BINO-RC00007	COL-BINO-RC00007-0004	15	20	5	41.59
COL-BINO-DH00001	COL-BINO-DH00001-0013	43.6	45.8	2.2	40.81
COL-BINO-DH00001	COL-BINO-DH00001-0014	45.8	50	4.2	40.39
COL-BINO-DH00001	COL-BINO-DH00001-0015	50	55	5	40.12

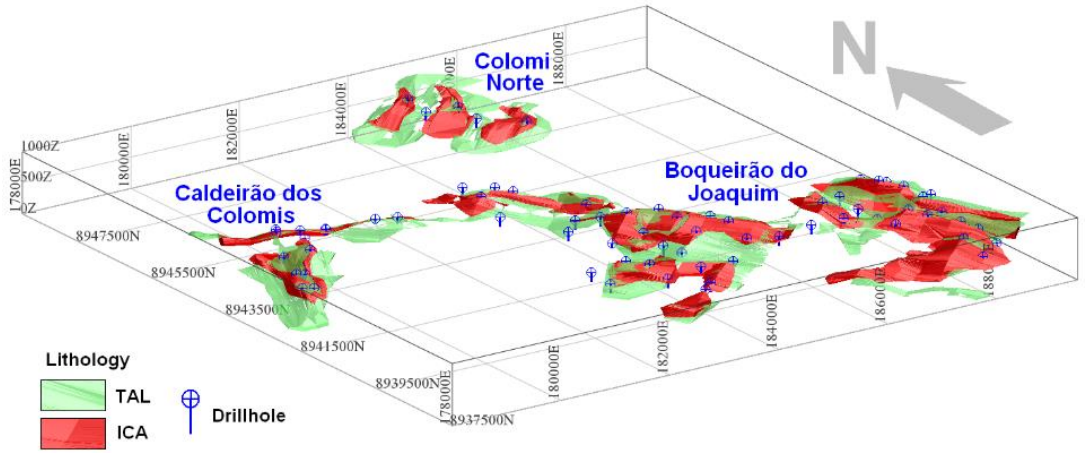
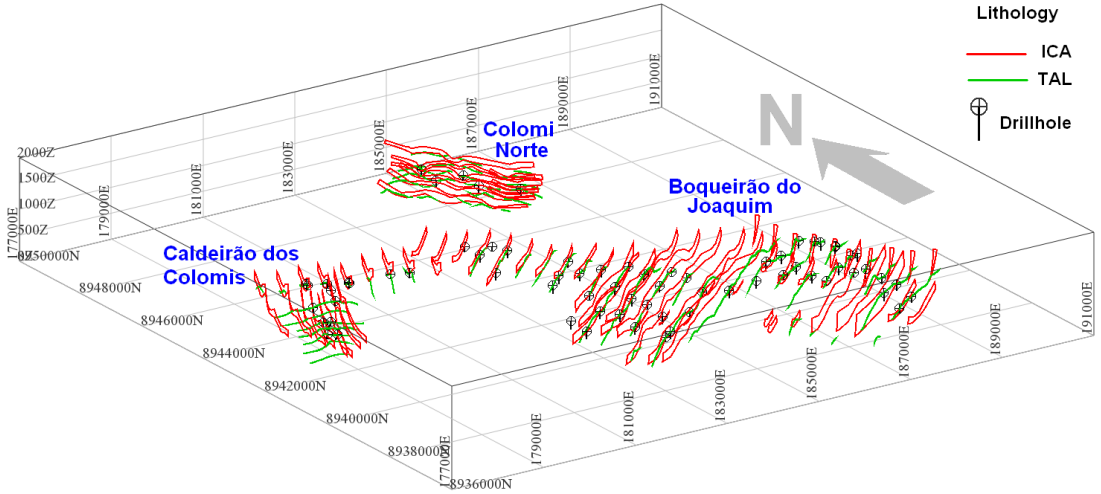
hole_id	sample_id	depth_from	depth_to	Length (m)	Fe%
COL-BISU-DH00003	COL-BISU-DH00003-0002	1	7	6	40.34
COL-BISU-DH00003	COL-BISU-DH00003-0006	15	20.9	5.9	41.00
COL-BISU-RC00004	COL-BISU-RC00004-0001	0	5	5	40.23
COL-BISU-RC00004	COL-BISU-RC00004-0002	5	10	5	42.91
COL-BISU-RC00004	COL-BISU-RC00004-0003	10	15	5	42.16
COL-BISU-RC00004	COL-BISU-RC00004-0004	15	20	5	40.38
COL-BISU-RC00009	COL-BISU-RC00009-0007	100	104	4	46.91
COL-BISU-RC00014	COL-BISU-RC00014-0002	1	5	4	41.19
COL-BISU-RC00014	COL-BISU-RC00014-0003	5	10	5	40.26
COL-BISU-RC00024	COL-BISU-RC00024-0019	130	135	5	43.07
COL-JACO-DH00001	COL-JACO-DH00001-0005	9.4	15	5.6	35.11
COL-JACO-DH00001	COL-JACO-DH00001-0006	15	18.6	3.6	36.54
COL-JACO-DH00001	COL-JACO-DH00001-0019	102.6	106	3.4	36.53
COL-JACO-DH00001	COL-JACO-DH00001-0021	110	115	5	35.44
COL-JACO-DH00001	COL-JACO-DH00001-0022	115	120.1	5.1	35.29
COL-JACO-DH00002	COL-JACO-DH00002-0004	4.3	10.3	6	38.01
COL-JACO-DH00002	COL-JACO-DH00002-0005	10.3	12	1.7	36.75
COL-JACO-DH00002	COL-JACO-DH00002-0010	30.3	35.8	5.5	37.02
COL-JACO-DH00002	COL-JACO-DH00002-0012	46	48	2	35.82

Criteria	JORC Code explanation	Commentary

hole_id	sample_id	depth_from	depth_to	Length (m)	Fe%
COL-JACO-DH00002	COL-JACO-DH00002-0013	48	55	7	39.81
COL-JACO-DH00002	COL-JACO-DH00002-0026	120	125	5	36.96
COL-JACO-RC00001	COL-JACO-RC00001-0009	35	40	5	36.01
COL-JACO-RC00005	COL-JACO-RC00005-0003	10	15	5	39.14
COL-JACO-RC00006	COL-JACO-RC00006-0001	0	5	5	35.68
COL-JACO-RC00006	COL-JACO-RC00006-0008	50	54	4	35.29
COL-JACO-RC00006	COL-JACO-RC00006-0023	104	109	5	36.56
COL-JACO-RC00006	COL-JACO-RC00006-0025	111	115	4	36.92
COL-JACO-RC00006	COL-JACO-RC00006-0026	115	120	5	39.90
COL-JACO-RC00006	COL-JACO-RC00006-0027	120	125	5	38.95
COL-JACO-RC00006	COL-JACO-RC00006-0028	125	130	5	35.65
COL-JACO-RC00006	COL-JACO-RC00006-0029	130	137	7	37.13
COL-BOJO-RC00006	COL-BOJO-RC00006-0008	35	40	5	35.20
COL-CAPI-DH00004	COL-CAPI-DH00004-0021	95	100	5	36.70
COL-QUEI-DH00002	COL-QUEI-DH00002-0002	5	10	5	36.10
COL-QUEI-DH00002	COL-QUEI-DH00002-0012	55	60	5	38.10
COL-CALD-DH00007	COL-CALD-DH00007-0009	35	40	5	36.48
COL-CALD-DH00007	COL-CALD-DH00007-0010	40	45	5	35.69

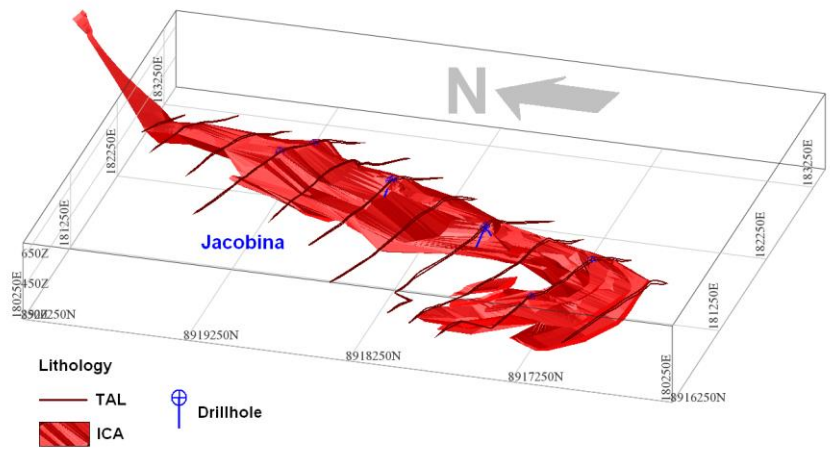
Data aggregation methods	• In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high	• Sample intervals shown in the table above have not been aggregated. Only high-grade samples with an Fe grade greater than 40% for Bicuda Norte and 35%Fe for Remanso and Jacobina have been included in the summary table above. For the mineral resource estimation, drillhole samples were composited to regular downhole lengths of 10m (Bicuda Norte) and 5m (remaining targets). Compositing was applied

Criteria	JORC Code explanation	Commentary
	grades) and cut-off grades are usually Material and should be stated.	to the mineralized intervals inside the geological model. • An appropriate grade of 25% Fe was used as a guide to create domains for the itabirites and talus domains wireframes (geological modelling).
	• Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. • The assumptions used for any reporting of metal equivalent values should be clearly stated.	• Intercept limits were guided by lithological interpretations during core-logging. GE21 asserts that the intercept lengths are long, in excess of 50m and intra ore grade distribution on the whole is relatively uniform. • The resource modelling was carried out in 3D software and effect of apparent widths was accounted for estimation method.
Relationship between mineralization widths and intercept lengths	• These relationships are particularly important in the reporting of Exploration Results. • If the geometry of the mineralization with respect to the drill hole angle is known, its nature should be reported. • If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	• Mineralization is generally sub horizontal with local fold structures and this has been reported accordingly. Intercept widths are close to true mineralization as most drill holes are vertical to 70° dip. • Drilling intercepts are close to or perpendicular to mineralization layers
Diagrams	• Appropriate maps and sections (with scales) and tabulations of intercepts	• See following pictures:

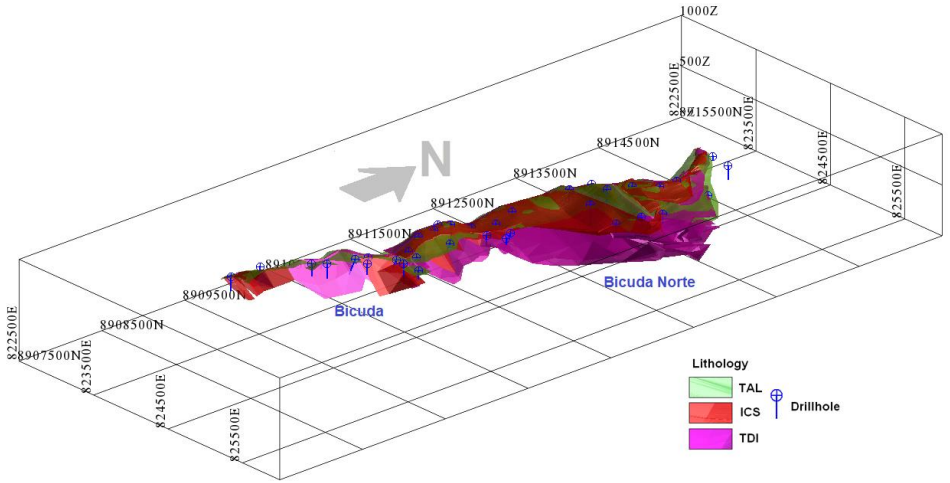
Criteria	JORC Code explanation	Commentary
	should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	*Remanso:*   •

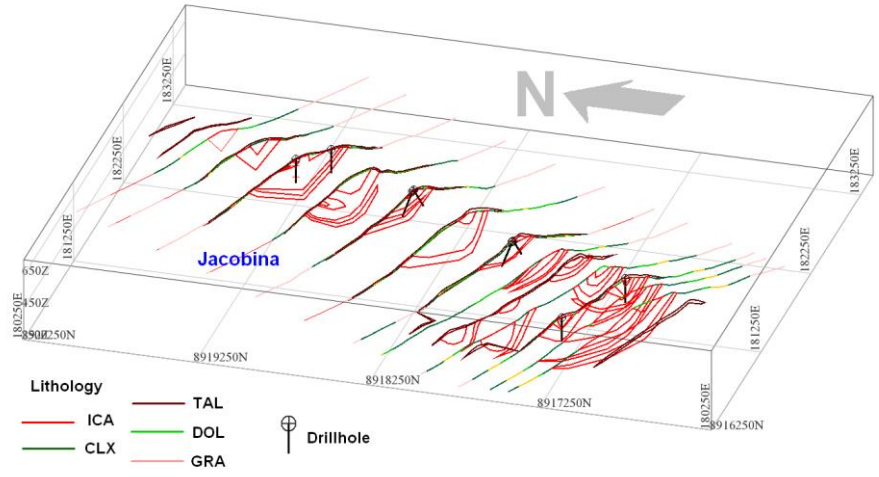
Criteria	JORC Code explanation	Commentary

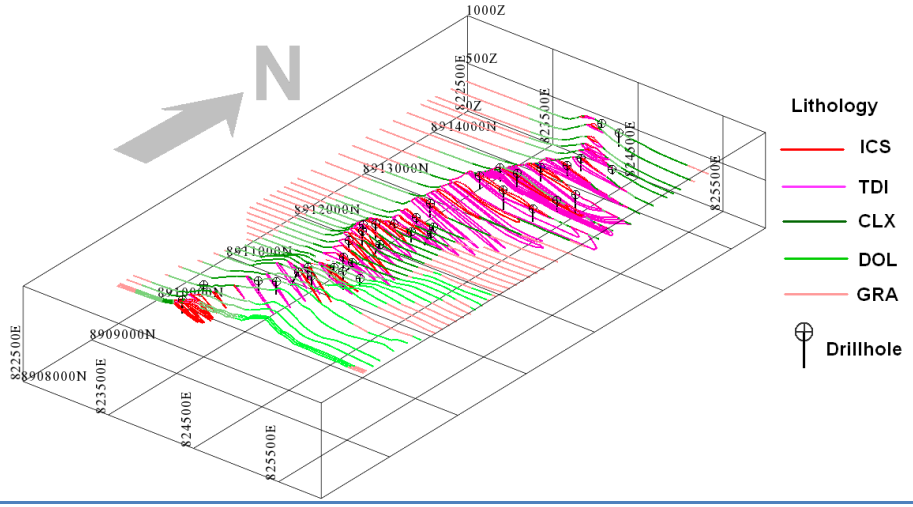
Jacobina:

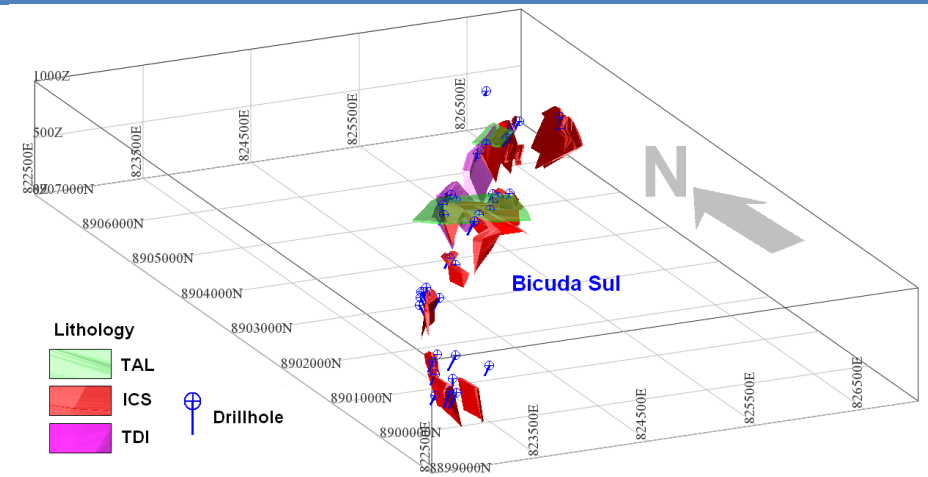
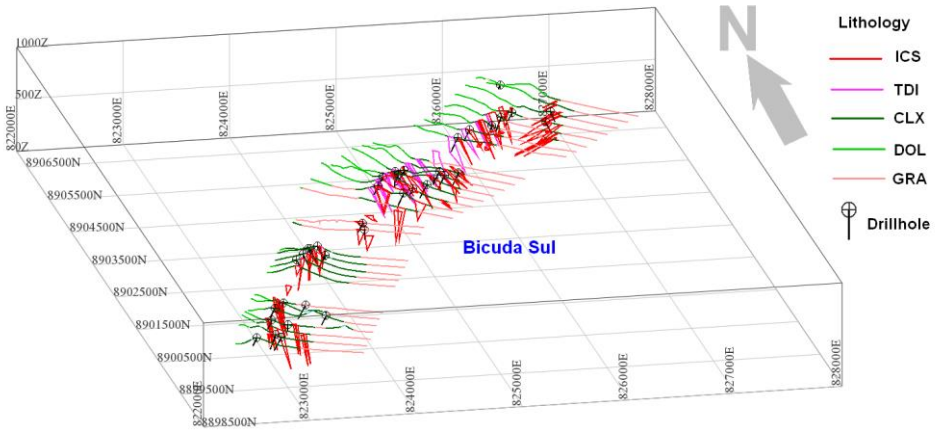


Bicuda Norte:



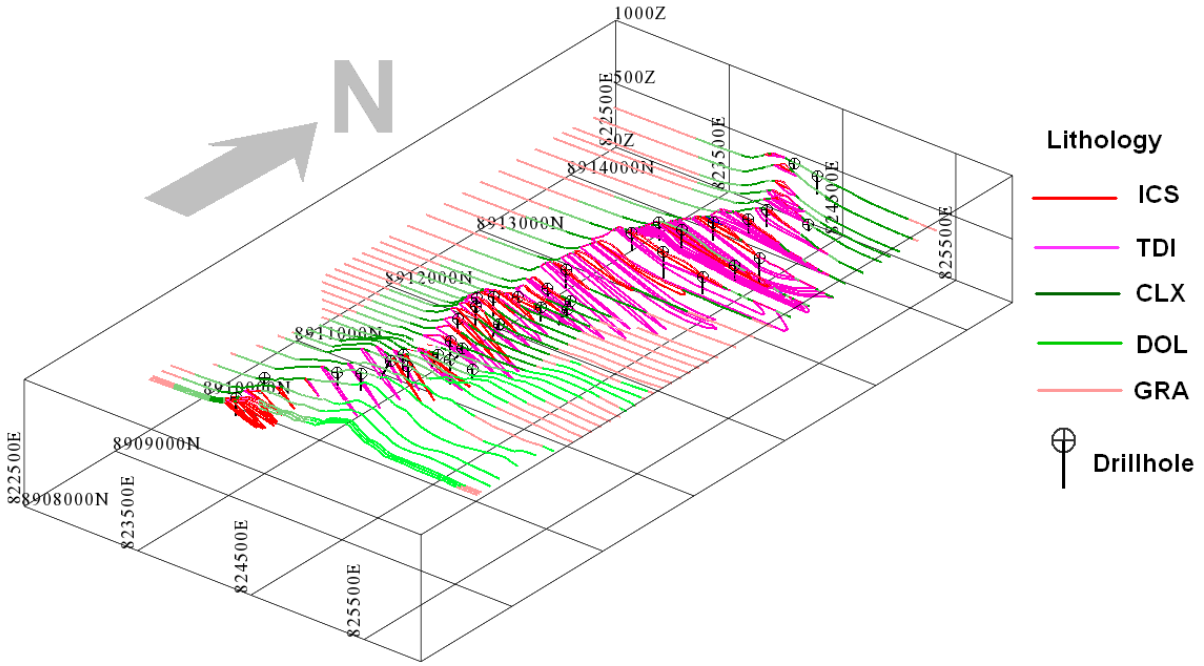




Criteria	JORC Code explanation	Commentary
Bicuda South:  		
Balanced reporting	• Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	• The drilling databases are highly organized with drilling Intercepts and its grade x length reports are properly stored and readily available within on the drillhole database.
Other substantive exploration data	• Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious	The table below shows the exploration activities undertaken and reported on within the exploration areas.

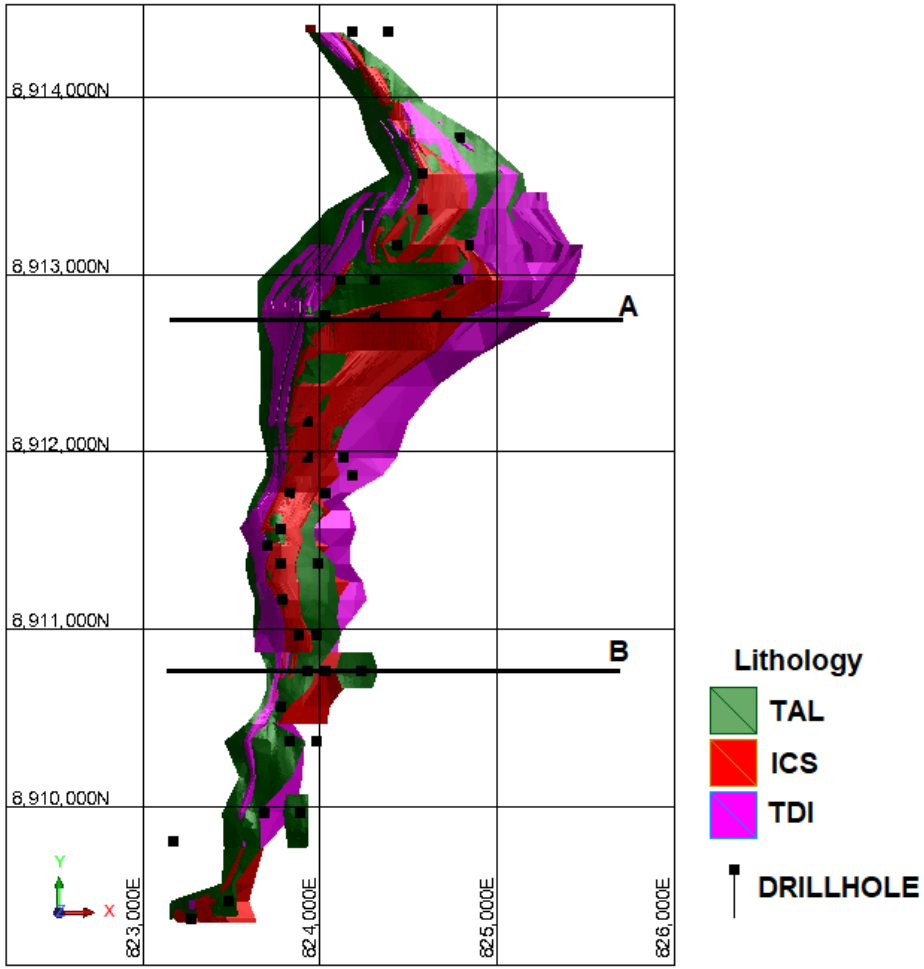
Activity	Unit	Quantity
Topography – topographic station	Station	37
Topography- Total station planialtimetric survey	km	451.20
Topography-polygonal control total station	km	154.55
Geological Mapping	station	2,681
Rock Samples - Chemical analyses	Sample	204
Rock Samples -chemical and petrographic	Sample	110
Geophysics - Magnetometry airborne survey	Km	4,044.00
Geophysics – Ground magnetometry	Km	224.2
Ground Geophysics-Gravimetry	km	144

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td>or contaminating substances.</td><td>
<table>
<tr><td>Reverse Circulation Drilling</td><td>m</td><td>12180</td></tr>
<tr><td>Reverse Circulation Drilling</td><td>Holes</td><td>96</td></tr>
<tr><td>Chip Samples -chemical analyses</td><td>sample</td><td>1129</td></tr>
<tr><td>Diamond Drilling</td><td>m</td><td>7134.80</td></tr>
<tr><td>Diamond Holes</td><td>holes</td><td>56</td></tr>
<tr><td>Core samples -chemical analyses</td><td>sample</td><td>836</td></tr>
<tr><td>Core Samples density-tests</td><td>sample</td><td>1973</td></tr>
<tr><td>Samples for QA/QC-chemical analyses</td><td>sample</td><td>492</td></tr>
<tr><td>Samples for process test work</td><td>sample</td><td>7</td></tr>
</table>
</td></tr>
<tr><td>Further work</td><td>• The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</td><td>Based on the positive geological indications GE21 considers the Colomi Project to be an advanced iron ore deposit. It is for this reason that GE21 recommends the continuity of the current follow up development program and an additional exploration budget to increase the confidence of the defined resources by:
• Implementation of an infill diamond drilling program in a cross-shaped pattern with low spacing on Colomi targets (geostatistical cross) to use in a detailed variographic study to get optimization in drilling grid spacing.
• Continue with the reverse circulation and diamond drilling to determine the distribution and controls of the mineralization in the respective rock types using an appropriate drilling grid spacing to upgrade the resource classification.
• The drilling grid spacing (ranging from 100x100m2 in Bicuda, and 800x400m2 in Jacobina) was enough for Indicated Resource classification however requires additional infill drilling for reclassification to Measured Resource status.
• Undertake in-situ bulk density measurements and continue the drill hole core dry bulk density determinations which will be obtained from direct density measurements on diamond core samples. This should provide relative density information on all the mineralized horizons as well as also the surrounding unmineralized lithologies and on the oxidized and weathered rocks. Perform a study of spatial variability of density data to determine an appropriate estimate of density values.
• Conduct additional metallurgical tests to confirm existing results on the feasibility of economically processing the different ore types existing within the deposit.
• To continue and improve the current QA/QC program.</td></tr>
</table>

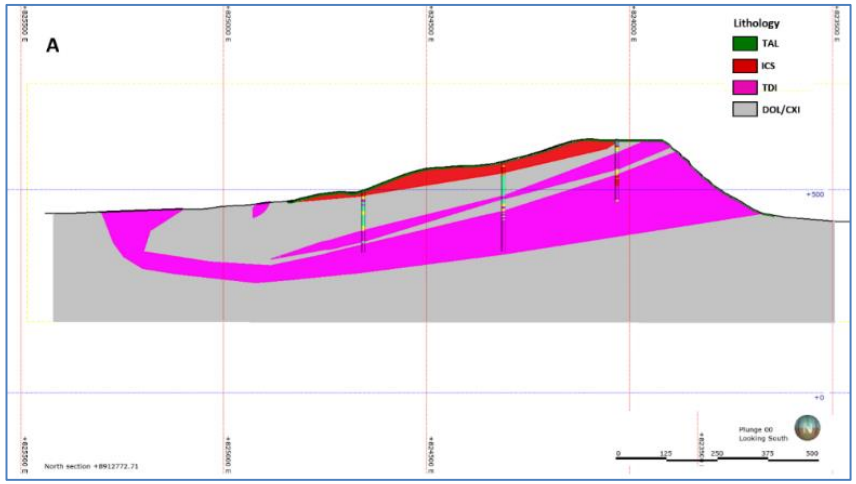
Criteria	JORC Code explanation	Commentary
	• Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Geological Wireframe: Bicuda Norte Deposit 

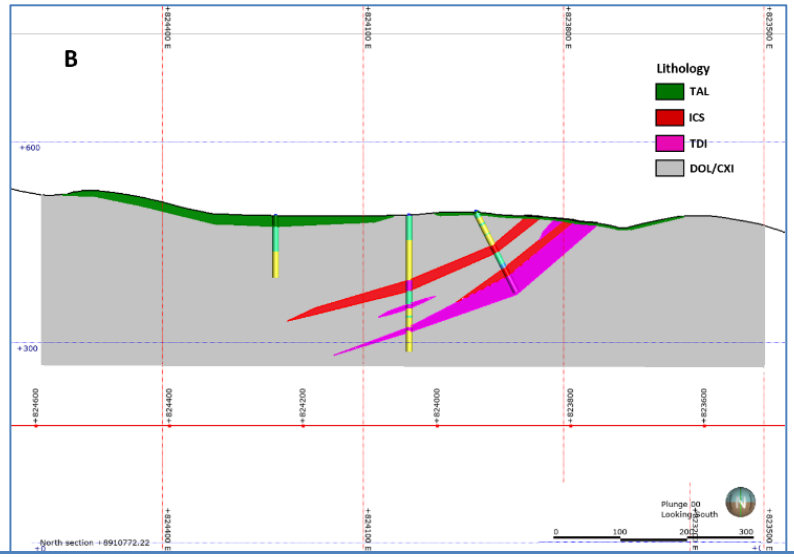
Criteria	JORC Code explanation	Commentary

Bicuda Norte Geological Model (mineralized lithologies only):



Bicuda Norte Geological Model: Sections A and B (Looking South)





Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	• Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.	• Measures taken by Vale to ensure data integrity started with drill hole logging data being transferred directly onto palm tops using LogMate software. All survey, logging, assay and density data was combined into a relational database. The database validation included checking for errors, missing intervals, overlapping intervals, gaps and breaks. The Colomi deposit drilling data base was received by GE21 in MS-Access database format for the four target areas, Remanso, Jacobina, Bicuda/Bicuda Norte and Bicuda Sul, in separate files.
	• Data validation procedures used.	• CP carried out an electronic validation of the databases with Gemcom Surpac software. No errors, as gaps or overlapping data, or other material inconsistencies were found.
Site visits	• Comment on any site visits undertaken by the Competent Person and the outcome of those visits. • If no site visits have been undertaken indicate why this is the case.	• A site visit was undertaken by Competent Person Leonardo Soares to the Colomi Project between 03rd and 07th June 2011. • Leonardo Soares who belongs to GE21 team considered it was not necessary to complete another site visit, given no further drilling has been completed and is available to view since 2011.
Geological interpretation	• Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit. • Nature of the data used and of any assumptions made.	• GE21 judges the geological model is appropriate for the degree of reliability associated with the mineral resource model in different portions of the deposit. • CP interpreted 111 vertical geological sections using the information recorded in fields “LITHO” in table “lithology” and “Fe” in table “assay” from drillhole database. Only the mineralization zones were modelled.
	• The effect, if any, of alternative interpretations on Mineral Resource estimation.	• The Colomi project is a conventional BIF deposit, and GE21 considers it highly improbable an alternative geological interpretation on the data available could be provided.
	• The use of geology in guiding and controlling Mineral Resource estimation. The factors affecting continuity both of grade and geology.	• The field “LITHO” represents the rock type described by the field geologist, and the field “Fe” is the chemical results for total Fe in samples. Four different unit groups were modelled: TAL= Talus Deposit (iron ore clasts); ICA = Compact Amphibolitic Itabirite; ICS = Compact Siliceous Itabirite; TDI = Dolomitic Itabirite. Grade estimation was controlled by geological (rock type) boundaries.

Criteria	JORC Code explanation	Commentary
Dimensions	• The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.	• The dipping of mineralization horizons and their extensions in corner sides of the model were interpreted according to drillhole data and geological maps with structural data received from Colomi. • Remanso is comprised of Mesas with flat lying Iron mineralization from the surface to a depth of between 150m and >300m in thickness in some prospects where some drilling ends in ore. The Remanso project covers approximately 8,000 hectares. • Jacobina Is a roughly N-S striking ridge line comprised of a synclinally folded sedimentary Iron horizon. The Iron outcrops peripherally and dips into the centre of the ridge. The ridge line has a strike length of approximately 5km and the iron mineralized horizon is variable in thickness from tens of meters to in excess of 100m in thickness in some places. • Bicuda Norte Is a ridge line of sedimentary Iron horizon, outcropping in the west and dipping at less than 20 degrees to the east. The surface generally outcrops in the west and is projected to be under cover in the east. The Bicuda ridge line has a strike length of approximately 5km and the iron mineralization is of variable in thickness from tens of meters to in excess of 200m in thickness in some places with some deep 200m diamond drill holes ending in ore. • The Bicuda South prospect covers approximately 8km of strike. The Iron mineralization is discontinuous and has a sub-vertical dip. The iron horizon pinches locally, thinning down to 5meters and thickening to in excess of 60m.
Estimation and modelling techniques	• The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.	• The geological wireframe models for each unit types were generated from vertical geological sections. All Geological models were cut by topographic surface to guarantee quality in volume adherence. • Three 3D block models were constructed for resource estimation purposes for targets Remanso, Jacobina, Bicuda Norte and Bicuda Sul. The block dimensions were defined as 100m x 100m x 5m and sub-blocks of 25m x 25m x 5m, based on a quarter of the drilling grid dimensions. The mineralized geological units TAL, ICA, ICS and TDI were stamped with “lito” block model attribute. • Variography was used to describe the spatial variability or correlation of an attribute recognized as a regionalized variable. • The visual and volumetric comparison between the geological wireframes and the block model shows a good fit for modelled units, with volumetric ratio (wireframe volume/block model volume) values inside the acceptable limit of variation (98% to 103%). • The Ordinary Kriging (OK) method was used to estimate Fe%, SiO2%, Al2O3%, Mn%, P% and LOI% variables. The method used to estimate the same variables in units with insufficient number of samples to generate variograms was the Inverse Distance Weighting (IDW method). For the TDI unit in Bicuda Sul the variograms from ICS unit

Criteria	JORC Code explanation	Commentary
		variables were considered for estimation because there are equivalences in grade variability and similarity in spatiality of the mineralization zones. The IDW plan is presented in the table below. • The established Kriging plan considered three estimation steps with progressive increase of search distances see table below. • The downhole experimental variograms were calculated to establish the structures for composite grades. Anisotropic variogram maps were constructed for Bicuda Norte and not constructed for other targets because of a lack of data. Then omni-directional horizontal variograms were calculated for the purpose of determination of major axis variability for targets Remanso, Jacobina and Bicuda Sul. For Remanso and Jacobina targets an isotropic in horizontal plan variogram was considered, because of the small number of samples and because no robust single direction variogram was found. For Bicuda Sul a major axis direction in azimuth 30° was founded and isotropic axis in orthogonal plan from the first one. The variography results are summarized in the Table below. • Units TAL for Remanso and Jacobina, TDI for Bicuda Sul and TAL for Bicuda Norte and Bicuda Sul had insufficient number of samples to variographic analysis.
	• The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	• CP received, from Colomi, datasets prepared by Vale for the four targets, including the wireframe geological models built in previous estimate. Colomi and CP agreed to generate a new geological model to avoid some issues from the previous model, such as the absence of “snap to point” between geological sections and drillhole data. Some geological features in previous model were revised and improved according to Colomi considerations.
	• The assumptions made regarding recovery of by-products.	• No assumptions were made for recovering by-products.
	• Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	• SiO_2, P, Al_2O_3, Mn, TiO_2, CaO, MgO, BaO, K_2O, Na_2O and Cr_2O_3 were assayed. The elements estimated were Fe%, SiO_2%, Al_2O_3%, Mn%, P% and LOI%. Preliminary tests and assays showed very low sulphur and an absence of asbestos.
	• In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed. • Any assumptions behind modelling of selective mining units.	• The block dimensions were defined as 100m x 100m x 5m and sub-blocks of 25m x 25m x 5m, based on a quarter of the drilling grid dimensions.

Criteria	JORC Code explanation	Commentary
	• Any assumptions about correlation between variables. • Description of how the geological interpretation was used to control the resource estimates.	• No assumptions were made by GE21 regarding the correlation between variables. • GE21 interpreted 111 vertical geological sections using the information recorded in fields "LITHO" in table "lithology" and "Fe" in table "assay" from the drillhole database. Only the mineralization zones were modelled. The field "LITHO" represents the rock type described by the field geologist, and the field "Fe" is the chemical results for total Fe in samples. Four different unit groups were modelled, as described below: TAL= Talus Deposit (iron ore clasts); ICA = Compact Amphibolitic Itabirite; ICS = Compact Siliceous Itabirite; TDI = Dolomitic Itabirite. The dipping of mineralization horizons and their extensions in corner sides of the model were interpreted according to drillhole data and geological maps with structural data received from Colomi. • The geological wireframe models for each unit types were generated from vertical geological sections. All Geological models were cut by topographic surface to guarantee quality in volume adherence.
	• Discussion of basis for using or not using grade cutting or capping.	• No capping limit was applied in grade estimate. Statistical analysis of grade distribution indicated grade capping was not required
	• The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	• Visual Validation for estimated grade was carried out with vertical sections, comparing drill samples grades to block grades. Visual validation shows a good correlation between the blocks estimated and the original samples. • Validation for estimated grade was carried out with a comparative Nearest Neighbouring estimation (NN). The relative smoothing in the kriging results is compatible with the kriging technique and is acceptable based on the resources classification and the data density and distribution. • Local validation by the Swath Plot method was carried out with the verification of local bias from comparative graphs for resource estimation variable (OK or IDW) and NN-Check, considering X, Y, or Z coordinates. The comparative analysis of estimative variables with the Nearest Neighbouring results shows the relative smoothing in the kriging results that are compatible with the kriging technique and is acceptable based on the resources classification and the data density and distribution. Considerable biases on depth end or in corners of block model are originated on the effect of small volume of blocks in boundary portions of mineralization zones and differences in estimation techniques (Kriging or IDW/ Nearest Neighbouring).

Criteria	JORC Code explanation	Commentary

Colomi Project
Inverse Distance Weighting Strategy

Step	Search Radius	Minimum Number of Samples	Maximum Number of Samples	Maximum Number of Drillholes per Drillhole
Remanso				
TAL Unit - Variables: Fe, SiO2, Al2O3, Mn P, LOI				
Searching Parameters: Bearing=0; Plunge=0; Dip=0; Major/Semi-Major Ratio= 1; Major/Minor Ratio=4.4				
1	270	3	30	1
2	600	3	30	1
3	1000	3	30	1
4	>1000	1	30	1
Jacobina				
TAL Unit - Variables: Fe, SiO2, Al2O3, Mn P, LOI				
Searching Parameters: Bearing=0; Plunge=0; Dip=0; Major/Semi-Major Ratio= 1; Major/Minor Ratio=3				
1	60	3	30	1
2	135	3	30	1
3	1000	3	30	1
4	>1000	1	30	1
Bicuda Norte				
TAL Unit - Variables: Fe, SiO2, Al2O3, Mn P, LOI				
Searching Parameters: Bearing=0; Plunge=0; Dip=0; Major/Semi-Major Ratio= 1.0; Major/Minor Ratio=1.4				
1	170	6	30	2
2	380	6	30	2
3	1000	4	30	2
4	>1000	1	30	2
Bicuda Sul				
TAL Unit - Variables: Fe, SiO2, Al2O3, Mn P, LOI				
Searching Parameters: Bearing=0; Plunge=0; Dip=0; Major/Semi-Major Ratio= 1; Major/Minor Ratio=1.6				
1	135	6	30	2
2	300	6	30	2
3	1000	4	30	2
4	5000	1	30	2

Colomi Project
Ordinary Kriging Strategy

Step	Search Radius	Minimum Number of Samples	Maximum Number of Samples	Maximum Number of Drillholes per Drillhole
Remanso				
ICA Unit - Variables: Fe, SiO2, Al2O3, Mn, P, LOI				
Searching Parameters: Bearing=0; Plunge=0; Dip=0; Major/Semi-Major Ratio= 1; Major/Minor Ratio=4.4				
1	270	6	30	2
2	600	6	30	2
3	1000	6	30	2
4	>1000	1	30	2
Jacobina				
ICA Unit - Variables: Fe, SiO2, Al2O3, Mn P, LOI				
Searching Parameters: Bearing=0; Plunge=0; Dip=0; Major/Semi-Major Ratio= 1; Major/Minor Ratio=1.5				
1	60	6	30	2
2	135	6	30	2
3	1000	6	30	2
4	>1000	1	30	2
Bicuda Norte				
ICS Unit - Variables: Fe, SiO2, Al2O3, Mn P, LOI				
Searching Parameters: Bearing=216; Plunge=2; Dip=12; Major/Semi-Major Ratio= 1.4; Major/Minor Ratio=4				
1	170	6	30	2
2	380	6	30	2
3	1000	4	30	2
4	>1000	1	30	2
TDI Unit - Variables: Fe, SiO2, Al2O3, Mn P, LOI				
Searching Parameters: Bearing=139; Plunge=-14; Dip=18; Major/Semi-Major Ratio= 1.5; Major/Minor Ratio=5				
1	170	6	30	2
2	380	6	30	2
3	1000	4	30	2
4	>1000	1	30	2
Bicuda Sul				
ICS and TDI Units - Variables: Fe, SiO2, Al2O3, Mn P, LOI				
Searching Parameters: Bearing=030; Plunge=0; Dip=0; Major/Semi-Major Ratio= 1.6; Major/Minor Ratio=6				
1	135	6	30	2
2	300	6	30	2
3	1000	4	30	2
4	5000	1	30	2

Moisture	• Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	• Mineral resource tonnages were estimated in a dry basis.

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td>Cut-off parameters</td><td>• The basis of the adopted cut-off grade(s) or quality parameters applied.</td><td>• GE21 applied variable cut-off grade (15 %, 20% and 25%) over Fe grades and decided to apply 15% Fe cut-off based on Its experience on other iron deposits on Brazil.
• A Whittle pit was performed to limit the resource to a Reasonable Prospect for Eventual Economic Extraction.</td></tr>
<tr><td>Mining factors or assumptions</td><td>• Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.</td><td>• Mining method is assumed to be conventional open pit mining, but there aren't specific assumptions made regarding possible mining methods applied.
• Geotechnical studies to define definite parameters for the final pit contouring are recommended.
• The table below presents the mining factors applied on the definition of the RPEEE.
<table>
<tr><th colspan="6">Mining Factors Parameters</th></tr>
<tr><th colspan="3">Item</th><th></th><th>Unit</th><th>Value</th></tr>
<tr><td rowspan="14">Revenue</td><td rowspan="2">Financial Parameters</td><td>Sales Price</td><td rowspan="14"></td><td>US$/t</td><td>130.3</td></tr>
<tr><td>Discount rate</td><td>%</td><td>NA</td></tr>
<tr><td rowspan="2">ROM</td><td>Density</td><td>g/cm³</td><td>model</td></tr>
<tr><td>Grades</td><td>% Fe</td><td>model</td></tr>
<tr><td rowspan="2">Mining</td><td>Mining Recovery</td><td rowspan="2">%</td><td>100%</td></tr>
<tr><td>Dilution</td><td>0%</td></tr>
<tr><td rowspan="4">Block Model</td><td>Block dimensions</td><td>Unit</td><td>Value</td></tr>
<tr><td>X</td><td rowspan="3">m</td><td>model</td></tr>
<tr><td>Y</td><td>model</td></tr>
<tr><td>Z</td><td>model</td></tr>
<tr><td rowspan="2">Overall Slope Angle</td><td>Waste</td><td rowspan="2">º</td><td>45</td></tr>
<tr><td>Ore</td><td>53</td></tr>
<tr><td rowspan="2"></td><td>Mass Recovery</td><td>%</td><td>60%</td></tr>
<tr><td>Cut-off Grade</td><td>Resource</td><td>% Fe</td><td>15%</td></tr>
<tr><td colspan="2"></td><td>Mining</td><td>ROM</td><td></td><td>2.00</td></tr>
</table>
</td></tr>
</table>

Criteria	JORC Code explanation	Commentary				
		Costs		Waste	US$/t mined	
			Processing		US$/t ROM	8.50
			G&A and Sales Royalties (CFEM 2%)		US$/t product	4.00
Metallurgical factors or assumptions	• The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.	• The mass recovery assumptions were based on similar projects in the project region.				
Environmental factors or assumptions	• Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	• Assumes all necessary environmental permitting will be obtained to allow development. • Assumes overburden and low-grade material stockpiled in engineering designed stockpiles adjacent the working pits. • Assumes tailings from the beneficiation process stored in a downstream constructed facility designed to best engineering practice. • The estimate of mineral resources may be materially affected by environmental, permitting, legal, marketing, or other relevant issues. • GE21 has recommended specialist environmental, infrastructure and logistic studies as well as conceptual mining, engineering, marketing and financial studies				
Bulk density	• Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the	• The density applied in the block model was defined by the average value obtained by the experimental specific gravity test for each lithotype.				

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td>method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.
• The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.
• Discuss assumptions for bulk density estimates used in the evaluation process of the different materials</td><td>• There were three density determinations methods: Jolly method for drill core samples, oven drying and sealing with paraffin wax for weathered rocks and in-situ field tests for Talus (TAL). 1973 density determinations tests were carried out on all rotative drill holes made every 3 m depth in ore zones and every 10 m in waste zone. The intervals were selected respecting geological contacts and weathering zone limits.
• The table below summarizes the bulk density values used in the resource estimation.
<table>
<tr><th colspan="3">Colomi Project
Density Data</th></tr>
<tr><th>Target</th><th>Unit</th><th>Density (g/cm3)</th></tr>
<tr><td rowspan="2">Remanso</td><td>ICA</td><td>2.98</td></tr>
<tr><td>TAL</td><td>1.80</td></tr>
<tr><td rowspan="2">Jacobina</td><td>ICA</td><td>3.15</td></tr>
<tr><td>TAL</td><td>1.80</td></tr>
<tr><td rowspan="3">Bicuda Norte</td><td>ICS</td><td>3.19</td></tr>
<tr><td>TDI</td><td>3.32</td></tr>
<tr><td>TAL</td><td>1.80</td></tr>
<tr><td rowspan="3">Bicuda Sul</td><td>ICS</td><td>3.26</td></tr>
<tr><td>TDI</td><td>3.32</td></tr>
<tr><td>TAL</td><td>1.80</td></tr>
</table></td></tr>
<tr><td>Classification</td><td>• The basis for the classification of the Mineral Resources into varying confidence categories.
• Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).
• Whether the result appropriately reflects the Competent Person’s view of the deposit.</td><td>• The Colomi Project mineralization zones are classified as Indicated and Inferred Mineral Resource based on the assessment of the input data, geological interpretation and quality of grade estimation. The Colomi Project Mineral Resource also was classified as Inferred to Indicated in units (lithologies) that was estimated by ordinary kriging. This group of units is represented by ICA in Remanso and Jacobina, and ICS and TDI in Bicuda, Bicuda Norte and Bicuda Sul. Unit TAL was classified as Inferred Resource.

• The anisotropic average distance to samples on ordinary kriging estimation was adopted as criteria to distinguish Indicated and Inferred resource classes. Due to the variographic analysis results not being robust (too few sample pairs in variographic searching) the maximum range presented by directional variogram in the main structural direction for Colomi project (Maximum Range = 520m) was adopted as the anisotropic average distance to samples. Blocks with anisotropic average distance to samples lower than</td></tr>
</table>

Criteria	JORC Code explanation	Commentary

520m was classified as Indicated Resource and was further regrouped by graphical procedure (defined by polygon areas from visual analysis) to improve the classification spatial distribution, avoiding issues of “bull’s eyes”.

- The total Mineral Resource with 15%Fe cutoff grade applied is 5,059Mt at 26.61%Fe, 51.21%SiO2, 1.99%Al2O3, 0.37%Mn, 0.028%P and 3.81%LOI including Indicated Resources of 969Mt at 27.67%Fe, 47.76%SiO2, 1.57%Al2O3, 0.28%Mn, 0.032%P and 4.30%LOI (Table Below).
- GE21 agree that the result properly reflects their view of the deposit, related to the tonnage and grade computation, geological continuity, among other factors.

Grade Tonnage Table – Effective Date 12th April 2024

Mineral Resources - Colomi Iron Mineração Ltda - Colomi Project

Block Model: 100m X 100m X 5m (25m X 25m X 5m) - Grade cut off applied: 15%Fe

Unit	Resource Class	Tonnes (Mt)	Fe (%)	SiO2 (%)	Al2O3 (%)	Mn (%)	P (%)	LOI (%)
ICA	Indicated	665	25.86	48.19	1.68	0.29	0.026	4.83
	Inferred	3180	25.42	52.63	2.06	0.43	0.025	3.84
	Total	3845	25.49	51.86	2.00	0.41	0.025	4.01
ICS	Indicated	111	30.79	49.24	1.96	0.37	0.061	2.42
	Inferred	104	31.72	49.48	1.88	0.27	0.053	1.95
	Total	215	31.24	49.36	1.92	0.32	0.057	2.19
TDI	Indicated	193	32.12	45.45	0.95	0.23	0.035	3.53
	Inferred	443	33.91	45.19	0.81	0.22	0.032	2.67
	Total	636	33.37	45.27	0.85	0.22	0.033	2.93
TAL	Inferred	363	23.88	55.83	3.97	0.34	0.030	4.20
	Total	363	23.88	55.83	3.97	0.34	0.030	4.20
Total	Indicated	969	27.67	47.76	1.57	0.28	0.032	4.30
	Inferred	4090	26.36	52.03	2.09	0.40	0.027	3.70
	Total	**5059**	**26.61**	**51.21**	**1.99**	**0.37**	**0.028**	**3.81**

Criteria	JORC Code explanation	Commentary
Audits or reviews	• The results of any audits or reviews of Mineral Resource estimates.	• In 2013 Coffey developed the "Colomi Project, Brazil Independent Technical Report on Exploration and Mineral Resources Estimation" which audited the entire Colomi Project database. Porfírio Rodriguez and Leonardo Rocha who are the Competent Persons for this report, were associated of Coffey Mining, who provided consultancy on mineral resource estimate for Colomi during the period from 2011 to 2015, including site visits. Both are members of the Australian Institute of Geoscientists ("MAIG") and are independent of Colomi. Currently both CPs are members of GE21 team.
Discussion of relative accuracy/ confidence	• Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate. • The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.	• The anisotropic average distance to samples on ordinary kriging estimation was adopted as criteria to distinguish Indicated and Inferred Resource classes. Due to the variographic analysis results not being robust (too few sample pairs in variographic searching) the maximum range presented by directional variogram in the main structural direction for Colomi project (Maximum Range = 520m) was adopted as the anisotropic average distance to samples. • Blocks with anisotropic average distance to samples lower than 520m was classified as Indicated Resource and was further regrouped by graphical procedure (defined by polygon areas from visual analysis) to improve the classification spatial distribution, avoiding issues of "bull's eyes". • The in-situ resources are wholly contained within the current tenement license boundary and do not take into account any external elements which may sterilize areas of the deposit for mining operations.
	• These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	• No production data available.