

# MINERAL RESOURCES AND MINERAL RESERVES

## XSTRATA-MERAPE CHROME VENTURE

The mineral resources and reserves statement of the Venture is set out below. Merafe has a 20,5% attributable interest in the resources and reserves in terms of the Venture Agreement. Merafe's ownership of the specific resources and reserves are set out earlier in the report. Copies of the consenting letters and diagrams of the areas and modifying factors are available on request from the company secretary and/or are on the website. The address of the Competent Persons is Xstrata Head Office, Portion 27, Farm Waterval 306JQ, Rustenburg, 0300.

The Venture has adopted the 2007 SAMREC and the JORC Codes for Reporting Exploration Results, Mineral Resources and Ore Reserves as its mandatory standards for the estimation of public reporting of Mineral Resources, Ore Reserves (Mineral Reserves in the case of the SAMREC Code) and Exploration Results.

The estimation process of the Venture is further based on the Xstrata Alloys procedure "HSEC-G-08-The Procedure for the estimation of Mineral Resources and Ore Reserves".

The Ore Reserves and Mineral Resources are declared as at 30 June 2009, unless stated otherwise.

The Ore Reserve and Mineral Resource information in the tables on the following pages is based on information compiled by Competent Persons (as defined by the JORC and SAMREC Codes).

The Competent Person initials have been included after each mine or project for which the Competent Person has been responsible. Each of the Competent Persons has the appropriate professional membership and the relevant experience in relation to the mineral resources and/or ore reserves being reported by them to qualify as a competent person as defined in the SAMREC Code. The competent persons have consented to the inclusion in the report of the matters based on their information in the form and context in which it appears. Copies of the consenting letters are kept with the legal department of the Venture.

Metric units are used throughout. All data is presented on a 100% basis. All tonnage and grade information has been rounded to reflect the relative uncertainty in the estimates; there may therefore be small differences in the totals. Mineral Resources are reported inclusive of those Mineral Resources modified to produce Ore Reserves.

Commodity prices and exchange rates used to estimate the economic viability of Ore Reserves are based on long-term forecasts applied at the time the estimate was calculated.

## STATEMENT BY COMPETENT PERSON

The Resource and Reserve statement has been reviewed and the relevant data extracted and compiled by Pieter-Jan Gräbe (P-JG). P-JG is the Lead Competent Person. P-JG is registered with the South African Council for Natural Scientists (SACNASP, Private Bag X450, Silverton, 0127), Reg. No. - 400177/87 and holds a BSc Hons. degree in Geology as well as a NHD in Metalliferrous Mining. P-JG is a geologist with 22 years experience in mineral exploration and mining geology, directly linked to the mining industry. P-JG is a full time employee of Xstrata Alloys. P-JG consents to the inclusion in this report of the matters based on this information in the form and context in which it appears.

### Pieter-Jan Gräbe

Xstrata Alloys  
PO Box 2131  
Rustenburg  
0300  
RSA  
Tel: (014) 590 2415  
Fax: (014) 590 2498

# MINERAL RESOURCES AND MINERAL RESERVES CONTINUED

---

## DEFINITIONS

The following definitions (as per the SAMREC Code 2007), have been applied in estimating the Mineral Reserves and Mineral Resources position of in respect of the Xstrata-Merafe Chrome Venture disclosed within this document.

**Mineral resource:** a concentration or occurrence of material of economic interest in or on the earth's crust in such form, quality and quantity that there are reasonable and realistic prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a Mineral Resource are known, or estimated from specific geological evidence, sampling and knowledge interpreted from an appropriately constrained and portrayed geological model. Mineral Resources are sub-divided, and must be so reported, in order of increasing confidence in respect of geoscientific evidence, into Inferred, Indicated and Measured categories.

**Inferred mineral resource:** is that part of a Mineral Resource for which volume or tonnage, grade and mineral content can be estimated with only a low level of confidence. It is inferred from geological evidence and sampled and assumed but not verified geologically or through analysis of grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that may be limited in scope or of uncertain quality and reliability.

**Indicated mineral resource:** is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on information from exploration, sampling and testing of material gathered from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological or grade continuity but are spaced closely enough for continuity to be assumed.

**Measured mineral resource:** is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable information from exploration, sampling and testing of material from locations such as outcrops, trenches, pits, workings and drill holes. The locations are spaced closely enough to confirm geological and grade continuity.

**Mineral reserve:** the economically mineable material derived from a Measured or Indicated Mineral Resource or both. It includes diluting and contaminating materials and allows for losses that are expected to occur when the material is mined. Appropriate assessments to a minimum of a Pre-Feasibility Study for a project and a Life of Mine Plan for an operation must have been completed, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors (the modifying factors). Such modifying factors must be disclosed.

**Probable mineral reserve:** is the economically mineable material derived from a Measured or Indicated Mineral Resource or both. It is estimated with a lower level of confidence than a Proved Mineral Reserve. It includes diluting and contaminating materials and allows for losses that are expected to occur when the material is mined. Appropriate assessments to a minimum of a Pre-Feasibility Study for a project or a Life of Mine Plan for an operation must have been carried out, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. Such modifying factors must be disclosed.

**Proved mineral reserve:** is the economically mineable material derived from a Measured Mineral Resource. It is estimated with a high level of confidence. It includes diluting and contaminating materials and allows for losses that are expected to occur when the material is mined. Appropriate assessments to a minimum of a Pre-Feasibility Study for a project or a Life of Mine Plan for an operation must have been carried out, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. Such modifying factors must be disclosed.

### **BRIEF DESCRIPTION OF EXPLORATION ACTIVITIES**

Exploration is done mainly through drilling vertical core exploration boreholes. In addition, geophysical surveys are conducted on all the major operating mines and projects. Exploration drilling is done on two fronts, firstly ahead of the operating mines and secondly in project areas. The main emphasis is to increase geological knowledge and to comply with legislative requirements. The bulk of the exploration boreholes are drilled on a pre-determined grid. Further exploration boreholes are drilled to target geological anomalies and to provide geological and geotechnical information for detailed mine planning. The Venture has spent R11.6 million during the 2009 financial year on exploration activities for the various mines and project areas. A total of 95 boreholes were drilled, totalling 22 861m of drill core. The borehole lengths ranged from 20m to over 400m.

### **GEOLOGICAL SETTING**

The Venture's chrome mining operations are all mining the chromitite deposits developed within the world renowned Bushveld Complex of South Africa. The Bushveld Complex is the largest known deposit of chrome ore in the world. The chrome ore is mined from shallow dipping (10° - 14°) tabular ore bodies. The chromitite ore-bodies are named as the LG6 Chromitite Package and the MG1 Chromitite Layer. The ore-bodies are modelled from exploration drillhole data, geophysical survey data and the geological data gathered from mapping the ore-bodies in the underground - and opencast mine workings. The spatial geometric - and geochemical characteristics of the various ore-bodies are modelled. It is from these models that the data is extracted to compile the Mineral Resource and Ore Reserve tonnage and grade estimates.

### **TYPE OF MINING AND MINING ACTIVITIES**

The chromitite layers are mined mainly underground using trackless mechanized mining equipment to transport the blasted ore to conveyor belt systems which convey the ore out of the mine to Run-of-Mine (ROM) stockpiles. The various ore-bodies are accessed through decline shafts developed on reef.

From the ROM stockpiles the ore is fed into the various plants for further beneficiation of the chromite. The ore-bodies are mined on a board-and-pillar lay-out. Opencast mining is done from time to time as required, usually down to a depth from surface of 30-35m.

### **PRODUCTION FIGURES**

The Venture has mined a total of 3,33Mt of ROM ore up to 31 December against a budget of 3.58Mt. The main reason for the lower actual ROM tonnage compared to the 2009 budget was the economic downturn, lower furnace production and the resultant cut back of ROM production. The 2009 ROM production was also lower than the 2008 ROM production of 3.77Mt for the same reason. The ROM production and beneficiated chromite is produced to supply the Venture's furnaces with feed stock for the production of FeCr. As stated earlier, this statement reflects the estimates at 30 June 2009. From 1 July 2009 to 31 December 2009, 1.789Mt of ROM was mined. This represents the tonnage depleted from the June 2009 ore reserve estimate.

### **LEGAL ENTITLEMENT.**

In the Venture all new order mining rights applications, mining right conversions, prospecting rights conversions and new order prospecting rights, have been granted by the Department of Mineral Resources and executed.

In respect of a portion of Horizon Mine (Ruighoek and Vogelstruiknek), an application to the High Court has been made by certain members of the Moloana family to review and set aside the conversion of mining rights granted by the Minister of Mineral Resources and to request that the conversion process start again. The Venture, Xstrata and Merafe, have entered a notice to oppose the application, as have the DMR and the advice of external legal advisors of the Venture, Merafe and Xstrata, having considered the matter and the papers, is that the application for the conversion process to be set aside is unlikely to be successful.

# MINERAL RESOURCES AND MINERAL RESERVES CONTINUED

---

## DESCRIPTION OF THE METHOD AND KEY ASSUMPTIONS MADE TO ESTIMATE MINERAL RESOURCES AND ORE RESERVES

The raw geological data is validated through various steps and routines before finally being compiled into a final data base. The data base data is statistically and geostatistically analysed to determine the inherent characteristics and variability of the data. The main ore-body components that are analysed are the distribution and variability of the thicknesses, the specific gravity of the various lithologies and the critical grade elements. The findings of the geostatistical analysis are used as input parameters in the interpolation and extrapolation of the borehole data to create a 2D block model covering the whole mining or project area. The block models form the basis from which the tonnage and grades are reported for the various Mineral Resource and Ore Reserve categories. The Mineral Resource categories are mainly based on the data point density. A data point density of 200m x 200m is used for the classification of Measured Mineral Resources. For Indicated Mineral resources a density of between 200m and 400m are used. Inferred Mineral Resources will be classified where the density is lower than 400m x 400m. All the non-mineralised areas and areas that may not be mined are excluded from the Mineral Resources, e.g. boundary pillars, crown pillars, large potholes, transgressive bodies, etc. The Ore Reserves are estimated by converting the Indicated Mineral Resources to Probable Ore Reserves and the Measured Mineral Resources to Proved Ore Reserves. The conversion is done by applying the following modifying factors; - an estimated geological loss factor (determined by losses in mined-out areas and projected forward), the predetermined mining extraction rate, ore losses on ore contamination rates from mining over break. The Ore Reserves areas are restricted to the 5-year detailed mine plan, except in the case of Thorncliffe - and Kroondal Mine where detailed Mine 2.4D mine plans have been constructed for the Life-of-Mine. No Inferred Mineral Resources have been converted to Ore Reserves.

## COMPARISON OF MINERAL RESOURCE AND ORE RESERVE ESTIMATES WITH PREVIOUS YEAR'S ESTIMATES

The annual Resource and Reserve estimate are compared with the previous year's statement and reconciled. The June 2008 Mineral Resource estimate for the Venture as a whole (eight operating mines and three project areas) was 438.23Mt (on a 100% basis). The June 2009 Mineral Resources estimate is 428.75Mt. The year-on-year difference of 9.48Mt is made up of 3.07Mt being mined from the Resource base. The balance of the difference is made up of changes due to new data becoming available through exploration drilling causing adjustments in SG's, thicknesses, geological loss areas and new results from the constructed block models. A first time block model was constructed for Horizon/Chromeden Mine. The June 2008 Ore Reserve estimate was 72.17Mt and the June 2009 estimate 69.23Mt. The year-on-year difference of 2.94Mt is made up of 2.69Mt ROM being mined from the Reserve base. The balance of the difference is made up of the combined result of gains and losses due to the reasons mentioned above (inclusive reporting), changes in the modifying factors and the 5-year detail mine plans.

## STATEMENT REGARDING INFERRED MINERAL RESOURCES AND FEASIBILITY STUDIES.

No feasibility studies were conducted during the reporting period and hence no Inferred Mineral Resources have been included.

## MATERIAL RISK FACTORS

No material risk effects the validity of the current Mineral Resource and Ore Reserve statement. All the legislative requirements have been met with respect to the rights to mining and prospecting for which the Mineral Resources and Ore Reserves have been reported. All the operating mines are mining under new order, executed, Mining Rights. The prospecting rights of all the prospecting areas have been converted to new order Prospecting Rights.

## SUMMARY OF ENVIRONMENTAL FUNDING AND MANAGEMENT

All Venture operations have developed and implemented their own environmental management programs (EMP), and systems which are fully aligned with ISO 14001 and the ICMM principles of sustainable development. The majority of its smelters achieved ISO 14001 certification and/or re-certification during 2009. Its mining operations use environmental management systems aligned with ISO 14001 standards, but are not certified. Baseline biodiversity and landscape function studies are conducted at the feasibility or exploration phase of projects and environmental risk assessments associated with impacts on biodiversity and landscape functions are undertaken for new operations or major changes to existing operations. Information from these studies is used, in consultation with the affected parties and concerned external stakeholders, for the development and implementation of biodiversity and landscape function management systems and programmes. Various audits are conducted across the operations. These range from first and second level internal audits to third party external audits. The Venture also makes use of specialist reports where necessary.

The Venture sets targets and effectively measure environmental performance against such targets and benchmark their performance against leading practises in the industry. Such targets and performances are reviewed at regular intervals to ensure continual improvement of environmental performance.

All employees are coached and trained regarding the efficient use of natural resources, reducing input material and waste.

All operations have closure plans which entails the rehabilitation of all disturbed areas, buildings etc. These plans are reviewed annually internally and independently and amended where applicable. They include closure cost estimates and anticipated costs of rehabilitation and restoration are provided for throughout the life of the operations. Day to day cost relating to environmental issues is budgeted for on an annual basis.

# MINERAL RESOURCES AND MINERAL RESERVES CONTINUED

## CONSOLIDATED CHROME MINERAL RESOURCES AND ORE RESERVES STATEMENT

as at 30 June 2009

Tonnages are quoted in million metric tonnes. Grades are quoted as % Cr<sub>2</sub>O<sub>3</sub>

|                                     | Attributable portion (%) | Mining Method | Commodity                      | ORE RESERVES  |               | MINERAL RESOURCES |                |               | Competent Person |
|-------------------------------------|--------------------------|---------------|--------------------------------|---------------|---------------|-------------------|----------------|---------------|------------------|
|                                     |                          |               |                                | Run-of-Mine   |               | Measured (Mt)     | Indicated (Mt) | Inferred (Mt) |                  |
|                                     |                          |               |                                | Proved (Mt)   | Probable (Mt) |                   |                |               |                  |
| <b>Operating Mines</b>              |                          |               |                                |               |               |                   |                |               |                  |
| Waterval Mine                       | 20,5%                    | UG            | Chrome Ore                     | 10 028        | 1,53          | 16 313            | 2,12           | 0,4           | NM/DR            |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | 31,63%        | 27,2%         | 41,28%            | 42,1%          | 43%           |                  |
| Kroondal Mine                       | 20,5%                    | UG/OC         | Chrome Ore                     | 2 426         | 3,13          | 9 570             | 3,78           | –             | NM/DR            |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | 29,03%        | 27,0%         | 42,69%            | 42,4%          | –             |                  |
| Kroondal Gemini (Kroondal ext)      | 20,5%                    | UG/OC         | Chrome Ore                     | 6 013         | 6,44          | 9 740             | 7,73           | 0,9           | NM/DR            |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | 31,86%        | 28,6%         | 43,00%            | 42,4%          | 42%           |                  |
| Marikana East (Kroondal ext)        | 20,5%                    | UG            | Chrome Ore                     | 1 510         | 0,26          | 4 644             | 1,89           | 0,5           | NM/DR            |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | 29,09%        | 27,4%         | 42,63%            | 42,2%          | 42%           |                  |
| Thornccliffe Mine                   | 20,5%                    | UG/OC         | Chrome Ore                     | 26 372        | 5,76          | 39 391            | 11,53          | 18,7          | BS/DR            |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | 37,76%        | 36,7%         | 40,38%            | 40,6%          | 41%           |                  |
| Helena Mine                         | 20,5%                    | UG/OC         | Chrome Ore                     | 5 729         | 0,04          | 17 116            | 8,14           | 63,0          | BS/DR            |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | 34,94%        | 34,1%         | 40,57%            | 39,7%          | 40%           |                  |
| Horizon/Chromeden Mine              | 20,5%                    | UG/OC         | Chrome Ore                     | –             | –             | 0,066             | 14,31          | 8,3           | NM/DR            |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | –             | –             | 41,80%            | 44,0%          | 43%           |                  |
| <b>Total</b>                        |                          |               |                                | <b>52,078</b> | <b>17,147</b> | <b>96,841</b>     | <b>49,50</b>   | <b>91,9</b>   |                  |
| <b>Projects/Non-operating Mines</b> |                          |               |                                |               |               |                   |                |               |                  |
| Wonderkop                           | 20,5%                    | UG            | Chrome Ore                     | –             | –             | –                 | 6,46           | –             | PJG              |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | –             | –             | –                 | 40,1%          | –             |                  |
| Townlands Extension 9               | 20,5%                    | UG            | Chrome Ore                     | –             | –             | –                 | 14,96          | –             | PJG              |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | –             | –             | –                 | 41,7%          | –             |                  |
| De Grootboom                        | 20,5%                    | UG/OC         | Chrome Ore                     | –             | –             | 0,838             | 0,66           | –             | BS/DR            |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | –             | –             | 40,32%            | 40,4%          | –             |                  |
| Boshoek Mine                        | 20,5%                    | OC/UG         | Chrome Ore                     | –             | –             | 0,101             | 18,23          | 0,1           | AM/PJG           |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | –             | –             | 39,12%            | 40,3%          | 41%           |                  |
| Klipfontein/Waterval                | 20,5%                    | UG            | Chrome Ore                     | –             | –             | 3 213             | 6,60           | 133,9         | NM/DR            |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | –             | –             | 42,48%            | 42,6%          | 42%           |                  |
| Marikana West (Waterval Ext)        | 20,5%                    | UG            | Chrome Ore                     | –             | –             | 3 869             | 0,81           | 0,8           | NM/DR            |
|                                     |                          |               | Cr <sub>2</sub> O <sub>3</sub> | –             | –             | 42,44%            | 42,6%          | 43%           |                  |
| <b>Total</b>                        |                          |               |                                | <b>–</b>      | <b>–</b>      | <b>8,021</b>      | <b>47,72</b>   | <b>134,8</b>  |                  |
| <b>Grand Total</b>                  |                          |               | Ore                            | <b>52,078</b> | <b>17,147</b> | <b>104,863</b>    | <b>97,22</b>   | <b>226,7</b>  |                  |

### Definitions

OC = Opencast; UG = Underground

### Notes

- The Mineral Resources are estimated as chromitite tonnages and grades to reflect the grades of the various individual chromitite layers. Xstrata is currently mining the LG6 - and MG1 Chromitite Layers.
- The grade block models for Thornccliffe, Helena, Kroondal and Waterval have been updated during August 2009 with the latest geological information. A new block model for Horizon/Chromeden was constructed during the same period.

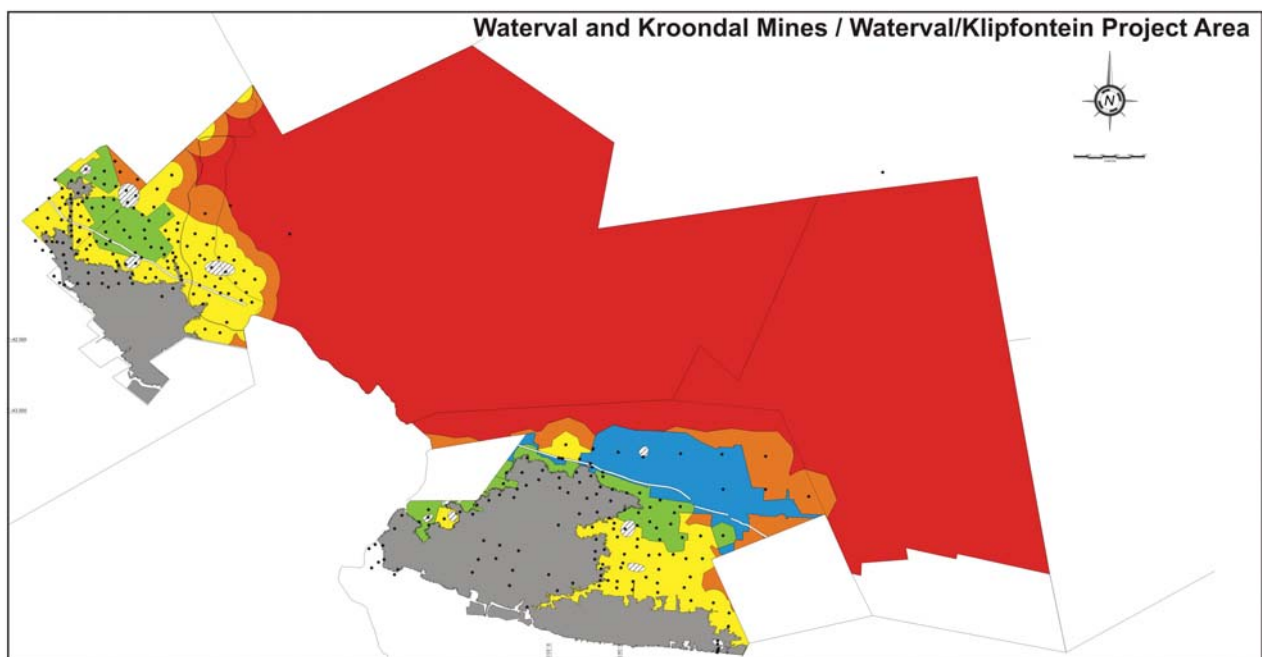
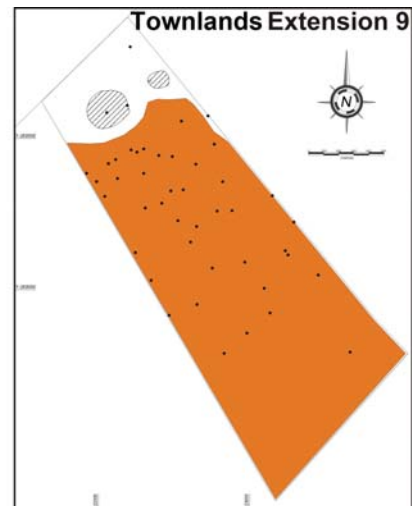
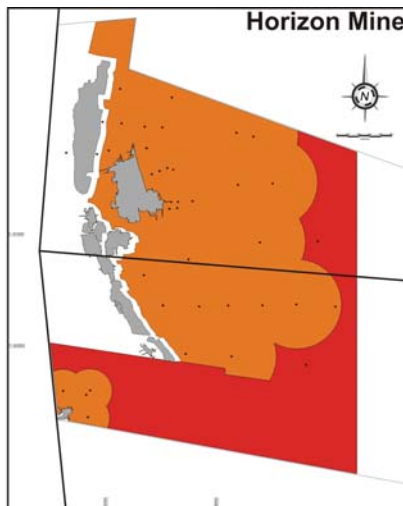
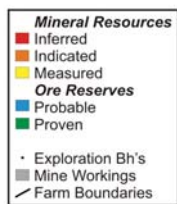
### Competent Person

PJG – Pieter-Jan Gräbe, Xstrata Alloys, (SACNASP). (Overall Responsibility for Resources and Reserves).; BS – Brian Smith, Xstrata Alloys, (PLATO). (Overall Responsibility for Resources and Reserves).; AM – Alfred Mabelane, Xstrata Alloys, (SACNASP). (Responsible for collection and validation of Resources data).; NM – Nathi Mntungwa, Xstrata Alloys, (SACNASP). (Overall Responsibility for Resources and Reserves).; DR – Dean Richards, Obsidian Consulting Services (SACNASP). Responsible for data validation, geostatistical analysis of data, Resource classification and construction of tonnage and grade block models and reporting of tonnage and grades from block models.

## LOCALITY MAPS

Appropriate locality plans indicating the Mineral Resource and Ore Reserve categories for the various mining and prospecting areas are included below:

Kroondal – and Waterval Mines and Klipfontein/Waterval Project areas



# MINERAL RESOURCES AND MINERAL RESERVES CONTINUED

- Mineral Resources**
- Inferred
  - Indicated
  - Measured
- Ore Reserves**
- Probable
  - Proven
- Exploration Bt's
  - Mine Workings
  - Farm Boundaries

