McG & M (Pty) Ltd

*t/a* ***iQuest***

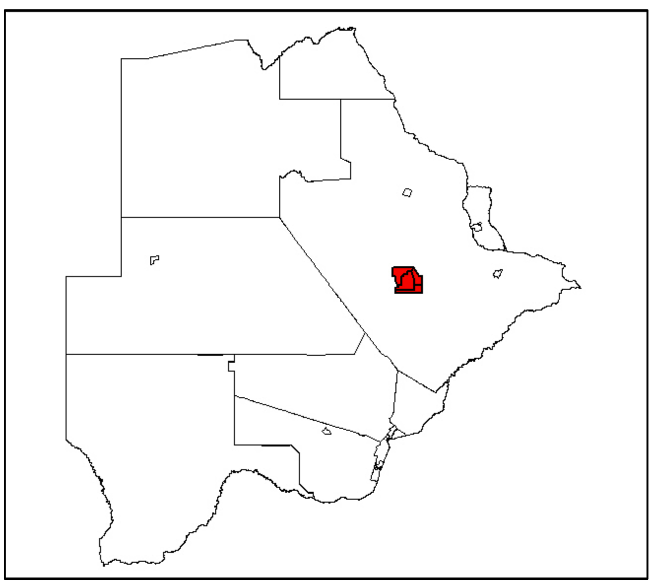
# NATIONAL INSTRUMENT 43-101 TECHNICAL REPORT

## prepared on the

# MALATSWAE DIAMOND EXPLORATION PROPERTY, BOTSWANA

## for

# PANGOLIN DIAMONDS CORP.



**Ian McGeorge C.Geol., Qualified Person**

**Effective Date: 20 October 2016**

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**Botswana**

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# 1 SUMMARY

At the request of Dr Leon Daniels, Chief Executive Officer of Pangolin Diamonds Corp. (ñPangolinò), McG & M (Pty) Ltd, t/a iQuest, (ñiQuestò) has prepared an Independent Technical Report compliant with National Instrument 43-101 on certain Prospecting Licences which constitute the Malatswae Diamond Property held by Pangolin in the Republic of Botswana. The effective date of this report is 20 October 2016.

Pangolinôs Malatswae Diamond Exploration Property consists of a block of four contiguous Prospecting Licences with a total area of 2,261 km$^2$ in central Botswana. The licences are held in the names of Pangolinôs Botswana incorporated and 100% owned subsidiaries Geocontracts Botswana (Pty) Ltd or Pangolin Diamonds (Pty) Ltd and are summarised below:

| Licence | Held by | Issued | Expires | Pangolin interest | Area (km$^2$) |
|---|---|---|---|---|---|
| 247/2014 | Geocontracts Botswana (Pty) Ltd | 01/07/2014 | 30/06/2017 | 100% | 839 |
| 529/2014 | Pangolin Diamonds (Pty) Ltd | 01/04/2015 | 31/03/2018 | 100% | 651 |
| 083/2015 | Pangolin Diamonds (Pty) Ltd | 01/04/2015 | 31/03/2018 | 100% | 359 |
| 086/2015 | Pangolin Diamonds (Pty) Ltd | 01/04/2015 | 31/03/2018 | 100% | 412 |
| **Total** | | | | | **2,261** |

The Licences, issued by the Minister of Mineral Resources, Green Technology and Energy Security, carry the exclusive right to prospect for diamonds within their defined areas. They do not confer any right to prospect for other minerals, nor any surface rights. A letter has been received from the Department of Mines, who are the administrators of the Licences, to the effect that as of the date of this report the above licences are in good standing.

The Licences are within the Kalahari Desert, 300 km north of the capital, Gaborone, and 150 km southwest of the regional centre of Francistown. The terrain is a flat, featureless savanna with a sandy soil and no perennial surface water. The region has a hot and semi-arid climate, with a seasonal rainfall during the summer months averaging 440 mm/annum, but very variable. Reliable water supplies can only be obtained from boreholes. The area is rural with a very low population density. The main economic activity is cattle ranching, and the land is communal tribal land farmed by individuals under leases issued by the local Land Board.

Access is fairly good with the tarred road leading northwards to the diamond mining town of Orapa passing close to the Property on its northeastern side. From this road numerous tracks and veterinary cut-lines allow access to the Property. The climate and terrain allow exploration work to continue all year round, with no distinct ñfield season.ò The towns of Serowe, 30 km to the south, and Letlhakane, 90 km to the north, are the closest points for fuel and other supplies.

The exploration target is primary diamond deposits in kimberlite pipes or dykes. The area has a history of diamond exploration dating back to 1984, and Pangolin has been active in the area since 2009.

The tectonic setting of the Property is within the Kaapvaal Craton, which is favourable for diamondiferous kimberlite. The famous Orapa Kimberlite Field is centred some 100 km to the northwest, and the diamondiferous Gope Kimberlite Field is some 165 km to the southwest.

There are no bedrock exposures within the Property, the bedrock being concealed by a few tens of meters of poorly consolidated sediments of the Cenozoic Kalahari Group. The bedrock is almost everywhere basaltic lava of the Jurassic Stormberg Lava Group which underlies much of central Botswana. A number of WNW-ESE trending, post basalt, dolerite dykes cross the area, and sills are also known to occur. Most, though not all, kimberlite pipes in Botswana are of Cretaceous age and thus post-date the basalts, but pre-date the Kalahari Group.

Pangolinôs main exploration approach has been the time-proven method of sampling for kimberlite indicator minerals. As the area has no drainages nor significant topography, the only medium for sampling is the surface soil which is sampled on grid patterns with sample intervals varying from 1 km x 1 km to as close as 50 m x 50 m.

Pangolin has carried out 1 km x 1 km reconnaissance sampling over 570 km$^2$ of the Malatswae Property and sampling is on-going as of the date of this report. Historical reconnaissance sampling at the same interval is available for almost all of the Property. In addition Pangolin has carried out closer spaced sampling on numerous grids around anomalous indicator counts. The total number of soil sampling records held by Pangolin, both of its own work and historical, exceeds 5,000.

The pattern of indicator minerals shows:

- i An area in the north, mainly on PL 529/2015, where garnet is the dominant mineral, with ilmenite being very rare.
- ii An area in the south, mainly on PL 247/2014, where ilmenite is dominant with garnet being rare.

This suggests that more than one kimberlite source is present, with the lack of ilmenite in the north pointing to a Group II kimberlite(s), whilst a Group I kimberlite(s) may be present in the south.

In general, the mineral counts from individual samples are low. However a number of very high interest grains have been found. Attention has focused on two areas where very detailed work has now been carried out, termed the MSC grid in the south, on PL 247/2014 and the MTS grid in the north, on PL 529/2015.

Detailed soil sampling on the MSC grid, over an area of some 3 km x 3 km, has recovered nine diamonds (including one Type II), picroilmenites (including some with adhering kimberlite), mantle garnets, forsteritic olivine and a mantle xenolith, all indicative of a kimberlite in the vicinity.

Detailed sampling on the 2 km x 2 km MTS grid, which is within the area where garnet is the dominant indicator mineral, has recovered three diamonds and numerous high interest pyrope garnets including some of G10 composition, which is favourable for a diamondiferous source.

In each grid surface textures suggest the grains are of proximal derivation and, although grains numbers are limited, mineral chemistry suggests that the sources are diamondiferous.

Strenuous efforts have been made to locate the kimberlite bodies believed to be present within or close to the MSC and MTS grids. Detailed ground magnetic surveys, gravity surveys and trial ground penetrating radar and CSAMT surveys have been carried out. Seven boreholes have been drilled at the MSC grid (including two cored) and nine on the MTS grid, all sited on geophysical features. However as of the date of this report, no kimberlite has been intersected.

Pangolin has also acquired detailed aeromagnetic data from the Botswana Department of Geological Survey (now the Botswana Geoscience Institute). Over 20 aeromagnetic anomalies have been followed up on the ground with soil sampling and ground geophysical surveys.

Pangolin has the capacity to process soil samples for indicator minerals in-house at the companyǿs Francistown base, using a 1 tonne per hour dense media separation (DMS) plant to prepare sample concentrates, which are then examined by a skilled mineral technician. Grains of interest are shipped to Dr Tom McCandless of MCC Geoscience, Inc., North Vancouver, British Columbia, Canada, for confirmations and surface texture analysis. Further analytical work, including electron microprobe analyses, is carried out in Canada.

Pangolin also conducts its own ground magnetic surveys. Other geophysical methods are assigned to contractors.

The Pangolin exploration program has been systematic and professional. However to date the results have been inconclusive, in that no kimberlite has been found. Challenges faced by Pangolin include:

- i The paradox of finding high interest, apparently proximal, indicator minerals but at low abundances. This is not without precedent, as studies have shown that indicator mineral counts can drop off sharply away from source kimberlites. Also, the presence of ferricrete and calcrete in the Kalahari Group profile may lead to the destruction of silicate phases, especially garnet.
- ii The basalt country rock, plus the numerous dolerite bodies, are magnetic and give rise to magnetic and gravity features which mimic those expected from kimberlite. This makes geophysical targeting difficult, and historical kimberlite drilling programs within the basalt of central Botswana have had a low success rate.

The company has created an unusual advantage over most other explorers in that it has established an in-house sample processing facility, and trained multiple field sampling teams. Companies without in-house laboratories face a limited choice of commercial laboratories, the costs of which are liable to be a severe constraint on the application of soil sampling, which, in most situations, remains the most effective kimberlite exploration method. Going forward, it is recommended that:

- i As soil sampling has been successful in discovering evidence of kimberlite, it is recommend that this exploration method be pursued through the collection of even more detailed grids over the areas of principle interest, at present the MSC grid and the MTS grid. Sample spacing could be reduced to <50 m.
- ii All sampling to date has used a bottom screen cut-off of 0.425 mm (35#). This almost precludes the recovery of spinels, which are typically small but which can in some locations be valuable indicator minerals. Reducing the bottom screen to 0.300 mm, or even 0.25 mm, would give the chance of recovering spinels, plus higher counts of other indicators.
- iii Larger sample volumes may assist in counteracting the low abundance of kimberlite indicator minerals.
- iv A program of regular repeat sampling of a set of sites, by the same methods and with the same sample parameters, is recommended in order to understand the level of reproducibility of results. Difficulties in the repeatability of Kalahari soil sampling data are well known, and a quantification of this would be valuable for diamond exploration in the Kalahari environment in general, and not only for the Malatswae Property.
- v Prospecting Licences 083/2015 and 086/2015 should be covered by 1 km x 1 km reconnaissance sampling in the same manner as PL 247/2014.
- vi With regards to sample treatment, it is recommended that audits be done on the discarded light fractions from the DMS plant by regularly sending a selection of samples to a commercial laboratory for bromoform separation and examination of the heavy mineral fraction.
- vii Pangolin has a very large database of both its own sampling data and historical data. However this data was found to need editing, and going forward better data management is recommended, in order that maximum leverage is gained from the database.

In conclusion, the Malatswae Property is an intriguing, high interest diamond property. Pangolin have been innovative and thorough in their exploration approaches and are encouraged to maintain their exploration effort. There is persuasive evidence that diamondiferous kimberlite is present within the Property area. Persistence should lead to its discovery.

# 2 INTRODUCTION

At the request of Dr Leon Daniels, Chief Executive Officer of Pangolin Diamonds Corp. Suite 1614, 25 Adelaide Street East, Toronto, Canada, (ñPangolinò), McG & M (Pty) Ltd, t/a iQuest, (ñiQuestò) has prepared an Independent Technical Report compliant with National Instrument 43-101 on certain Prospecting Licences which constitute the Malatswae Diamond Property held by Pangolin in the Republic of Botswana. The effective date of this report is 20 October 2016.

Pangolin Diamonds Corp. is a company incorporated in Ontario, Canada, and listed on the TSX Venture Exchange (symbol ñPANò). The company holds a portfolio of diamond exploration properties in Botswana through a number of wholly owned locally incorporated subsidiaries.

## 2.1 History of Pangolin Diamonds Corp.

Pangolin Diamonds Corp. was incorporated in Ontario on 09 November 2011 and is currently engaged in the acquisition, exploration and development of mineral properties in Botswana.

On 22 December 2011 the company acquired all of the issued and outstanding common shares of Pangolin Diamonds Ltd (ñPDLò), a private company incorporated under the laws of the Republic of Seychelles.

PDL is the 100% owner of Botswana incorporated subsidiaries Pangolin Diamonds (Pty) Ltd and Geocontracts Botswana (Pty) Ltd which were incorporated on 22 January 1987 and 15 March 1989 respectively. Both companies have as their registered office Plot 337/338, corner Khama Street and Selous Street, Francistown, Botswana. They hold and manage Pangolinôs prospecting licences in Botswana.

On 04 March 2013, Pangolin closed an amalgamation with Key Gold Holding Inc. (ñKey Goldò), a listed entity, and was consequently listed on the TSX.V.

## 2.2 Principal Sources of Information

Mr Ian McGeorge MSc CGeol FGS, consulting geologist and qualified person for this report, visited Pangolinôs Malatswae Property and the companyôs Francistown sample processing unit during the period 01 to 05 August 2016. During the visits, Mr McGeorge was accompanied by Pangolin resident manager and director Mr Onesimo Kufandikamwe.

A comprehensive review of technical data received from Pangolin before and during the field visit was undertaken, and sources listed in the ñReferencesò section of this report were consulted. Information was also obtained through discussions with Pangolin CEO Dr Leon Daniels.

This report was written by Mr McGeorge, iQuest, with assistance in data processing and in the preparation of figures from Mrs Johannah Nhiwatiwa MSc. iQuest has not previously prepared any Technical Report for Pangolin.

## 2.3 Independence and Qualifications

Neither iQuest nor Mr McGeorge has a business relationship, other than acting as an independent consultant, with Pangolin or any associated company, nor with any company mentioned in this Report, which is likely to materially influence their impartiality or create the perception that the credibility of this Report could be compromised or biased in any way. The views expressed herein are genuinely held and deemed independent of Pangolin.

Moreover, neither the author of this report nor iQuest has any financial interest in the outcome of any transaction involving properties considered in this Report, other than the payment of normal professional fees for the work undertaken in their preparation (which are based on hourly charge-out rates and reimbursement of expenses). The payment of such fees is not dependent upon the content or the conclusions of either this Report, or any consequences of any proposed transaction.

Pangolin has accepted that the qualifications, expertise, experience, competence and professional reputation of iQuestøs staff are appropriate and relevant for the preparation of this Report. Pangolin has also accepted that iQuestøs principal is a member of a professional body which is appropriate and relevant for the preparation of this Report.

## 2.4 No Material Change

iQuest is not aware of any material change with respect to the subject matter of this report that is not reflected in the Report, the omission to disclose which makes the Report misleading.

## 3 RELIANCE ON OTHER EXPERTS

iQuest has assumed that all of the information and technical documents reviewed and listed in the ñReferencesò are accurate and complete in all material aspects. While iQuest has carefully reviewed this information, iQuest has not carried out any investigation to verify its accuracy and completeness.

The Department of Mines has provided a letter dated 20 October 2016 confirming that the Prospecting Licences which make up the Malatswae Property are in good standing.

The information and conclusions contained herein are based on the information available to iQuest at the time of preparation of this Report, assumptions, conditions and qualifications as set out in the Report, and data listed in the ñReferences.ò

Pangolin Diamonds Corp. has warranted that a full disclosure of all material information in its possession or control has been made to iQuest. Pangolin has agreed that neither it nor its associates will make any claim against iQuest to recover any loss or damage suffered as a result of iQuestôs reliance upon the information provided by Pangolin for use in the preparation of this Report. Pangolin Diamonds Corp. has also indemnified iQuest against any claim arising out of the assignment to prepare this Report, except where the claim arises as a result of any proved wilful misconduct or negligence on the part of iQuest. This indemnity is also applied to any consequential extension of work through queries, questions, public hearings or additional work required arising from iQuestôs performance of the engagement.

Pangolin Diamonds Corp. has reviewed draft copies of the Report for factual errors. Any changes made as a result of these reviews did not involve any alteration to the conclusions made. Hence the statements and opinions expressed in this document are given in good faith and in the belief that such statements and opinions are not false and misleading at the date of this Report.

iQuest reserves the right to, but will not be obligated to, revise this Report and conclusions thereto if additional information becomes known to iQuest subsequent to the date of this Report.

# 4 PROPERTY DESCRIPTION AND LOCATION

Pangolinʼs Malatswae Diamond Property is located in the Republic of Botswana, southern Africa. It is comprised of four contiguous Prospecting Licences issued by the Minister of Minerals, Energy and Water Resources (now the Minister of Mineral Resources, Green Technology and Energy Security) in terms of the Mines and Minerals Act 1999 with a total area of 2,261 $km^2$ (Figure 1). The Licences are issued for "precious stones" only, in effect for diamonds, and carry no right to any other mineral.

Under the Mines and Minerals Act, a Prospecting Licence is issued for an initial period of up to three years, and then may be twice renewed for periods not exceeding two years each, giving a maximum possible validity of seven years. At least 50% of the area of a Licence must be relinquished at first and second renewals, except that physically contiguous and co-dated Licences may be treated as one area.

The holder of a Prospecting Licence is expected to carry out an agreed exploration program which is described in the Licence document, and to spend not less than the amounts set out in the Licence document during each year of the Licence validity. Failure to do so may result in an application for the renewal of the Licence being refused.

Prospecting Licences are administered by The Director, Department of Mines, to whom applications are made, and to whom work done on the Licence must be reported on a quarterly basis. The Licence holder is required to pay a rental of BWP 5.00/$km^2$/year during the validity of the Licence (subject to certain minimums). The maximum permissible area for a Prospecting Licence is 1,000 $km^2$, but blocks of multiple licences are permitted.

A Prospecting Licence does not give the right to mine, and diamonds recovered during the course of prospecting operations are the property of the State, and may not be sold.

The Mines and Minerals Act is currently the subject of a review and some material changes may be effected in the course of 2016 or 2017.

## 4.1 Malatswae Prospecting Licences

The Malatswae Property is situated in east-central Botswana within the Central (administrative) District (Figure 1). The Property is made up of four Licences as described in Table 1 below.

**Table 1. Malatswae Prospecting Licences**

| Licence | Held by | Issued | Expires | Pangolin interest | Area ($km^2$) |
|---|---|---|---|---|---|
| 247/2014 | Geocontracts Botswana (Pty) Ltd | 01/07/2014 | 30/06/2017 | 100% | 839 |
| 529/2014 | Pangolin Diamonds (Pty) Ltd | 01/04/2015 | 31/03/2018 | 100% | 651 |
| 083/2015 | Pangolin Diamonds (Pty) Ltd | 01/04/2015 | 31/03/2018 | 100% | 359 |
| 086/2015 | Pangolin Diamonds (Pty) Ltd | 01/04/2015 | 31/03/2018 | 100% | 412 |
| **Total** | | | | | **2,261** |

Pangolinøs current agreed prospecting programs, and minimum expenditure commitments against actual expenditures to date, are as in Table 2 below. All expenditures are in Botswana Pula (BWP). As PLs 529/2014, 083/2015 and 086/2015 are contiguous and co-dated they may be considered together; PL 247/2014 must be considered alone.

**Table 2. Malatswae Prospecting Licences, expenditure commitments *v* actual expenditures**

| Licence | Year | Anniv. date | Program | Minimum exp. per licence (BWP) | Actual (BWP) |
|---|---|---|---|---|---|
| 247/2014 | Year 1 | 30 June | Compile historical data<br>1 km x 1 km soil sampling & processing of samples | 35,000 | 4,358,476 |
| | Year 2 | | 250m x 250m follow up sampling and analysis | 50,000 | |
| | Year 3 | | Detailed ground geophysical surveys<br>Percussion drilling and treatment of drill samples | 165,000 | |
| Total commitment v actual expenditure for PL 247/2014 | | | | 250,000 | 4,358,476 |
| | | | | | |
| 529/2014 | Year 1 | 31 March | Interpretation of existing aeromagnetic data<br>Regional soil sampling | 50,000 | 1,413,109 |
| | Year 2 | | 250m x 250m follow-up sampling<br>Ground geophysical surveys<br>1,000m of core drilling | 250,000 | |
| 083/2015 | Year 1 | 31 March | Interpretation of existing aeromagnetic data<br>Regional soil sampling | 50,000 | 237,315 |
| | Year 2 | | 250m x 250m follow-up sampling<br>Ground geophysical surveys<br>1,000m of core drilling | 100,000 | |
| 086/2015 | Year 1 | 31 March | Interpretation of existing aeromagnetic data<br>Regional soil sampling | 50,000 | 150,854 |
| | Year 2 | | 250m x 250m follow-up sampling<br>Ground geophysical surveys<br>1,000m of core drilling | 100,000 | |
| Total commitment v actual expenditure for PLs 529/2014, 083/2015, 086/2015 | | | | P 850,000 | P 1,801,278 |

Prospecting Licence 247/2014 is in Year 3 as of the effective date of this report. The other three licences are in Year 2.

The Prospecting Licences give the right of legal access onto the Licences areas, but do not confer any surface rights.

Exploration work must be done with due consideration to the rights of land holders and with a view to minimising environmental impact. No specific environmental permits are required. The Malatswae area is rural and thinly populated communal farm land utilised for cattle ranching and is not environmentally sensitive is any notable respect.

As far as is known, Pangolin has obtained all necessary permissions from surface rights holders for access to the Prospecting Licences and has incurred no environmental liabilities.

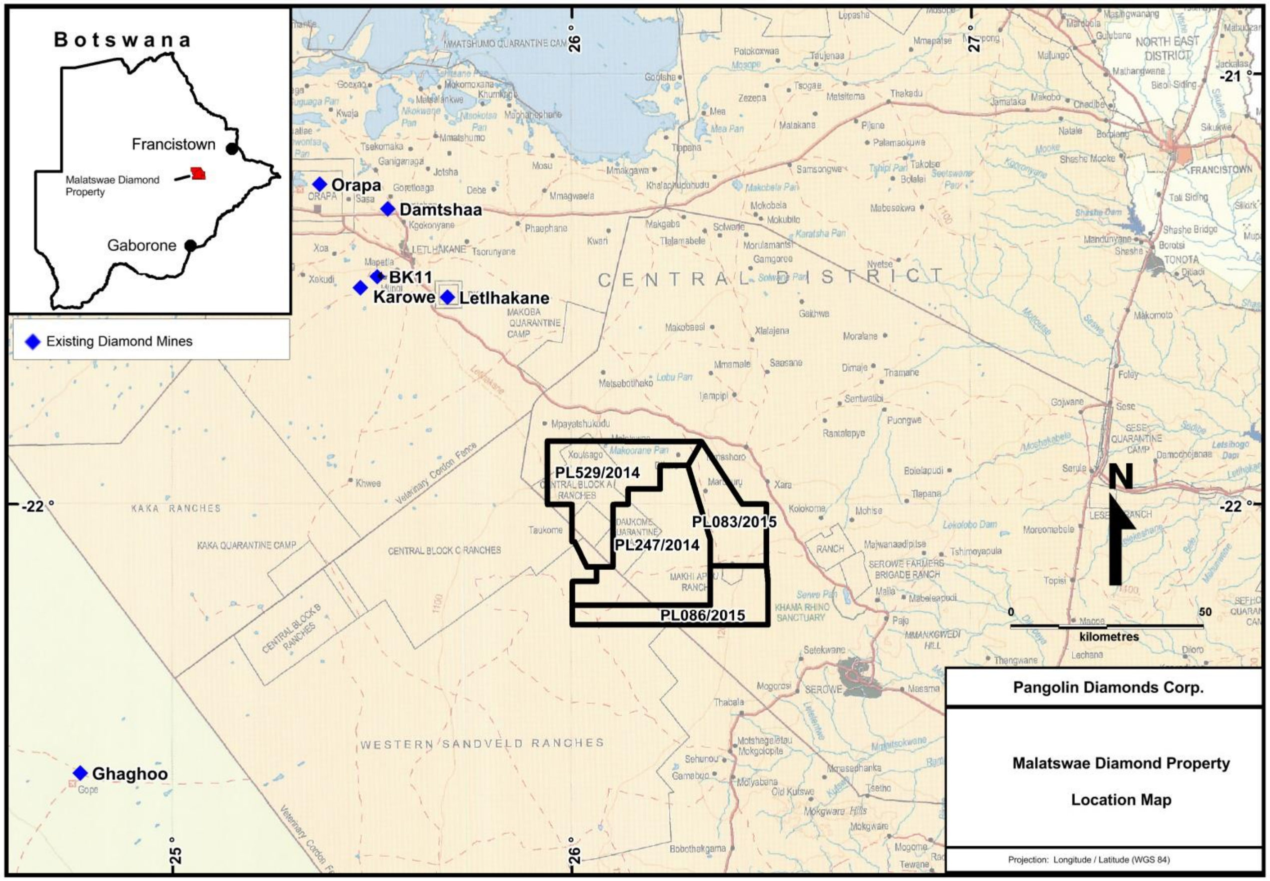


**Figure 1. Location map, Malatswae Diamond Property**
(Dž existing diamond mines)

# 5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE and PHYSIOGRAPHY

The Malatswae Property is within the Kalahari Desert of central Botswana. It is on a featureless plateau at an elevation of approximately 950 m amsl with only very subtle topographic relief. The soil is wind-blown Kalahari sand which supports a natural vegetation of grass and shrub savanna with occasional larger trees. The thickness of the vegetation is variable, and depends on historical wildfires and grazing patterns.

The climate is hot and semi-arid. Annual rainfall is approximately 440 mm/year but is highly variable. Almost all rain falls in the summer months of November to April, generally as a result of convective developments driven by high summer temperatures. Convective storms can be very localised and may be associated with sudden, short lived, high wind speeds. Summer days are hot, with an average maximum of >30ºC, whilst winters are mild with night temperatures <10ºC. Extreme summer temperatures can be >40ºC, whilst winter night temperatures may occasionally fall below 0ºC with resulting ground frosts (data from Department of Meteorological Services).

The climate and terrain allow exploration work to continue all year round.

There is no perennial surface water, and all water must be obtained from boreholes. The area is underlain at various depths by an aquifer, the Ntane Sandstone Formation, thus the groundwater potential is rated as good. Wellfields in the Ntane Sandstone provide water for the Orapa ï Letlhakane mining complex (Figure 1).

The Property area is rural with a very low population density. The land is all communal tribal land administered by the Ngwato Land Board in Serowe. There are no notable settlements within the Property, the closest being the village of Mmashoro to the east. The main land use is cattle ranching which is traditionally carried out on unfenced farms or ñcattle postsò but fenced farms are becoming more common.

Access is fairly good, with the tarred road from Serowe to the diamond mining towns of Letlhakane and Orapa passing just to the northeast of the Property (Figure 1). Veterinary fences and cut-lines, intended to control cattle disease, cross the area, and there are many farm tracks. The soft sand necessitates four-wheel drive vehicles. Where the thornbush is not thick it is possible to drive cross-country without roads.

The closest urban centres are Serowe, 30 km to the southeast, and Letlhakane 90 km to the northwest. Both have reliable fuel supplies and can provide most routine stores, and like most major villages in Botswana, have cell phone coverage. Cellular network coverage within the Property area is sporadic.

# 6 HISTORY

The Malatswae area has seen a number of historical diamond exploration programs, starting from 1984.

## 6.1 De Beers Prospecting Botswana

In the second quarter of 1984 De Beers Prospecting Botswana (Pty) Ltd was issued with a large block of Prospecting Licences, PLs 13 ï 22/84, which initially covered approximately 8,154 km$^2$ and were referred to as the Makoba Block. The present Malatswae Property was covered by portions of PLs 15/84, 18/84 and 21/84 (Figure 2), all of which were surrendered by De Beers at the first renewal of the licences in 1987 (De Beers Prospecting 1997).

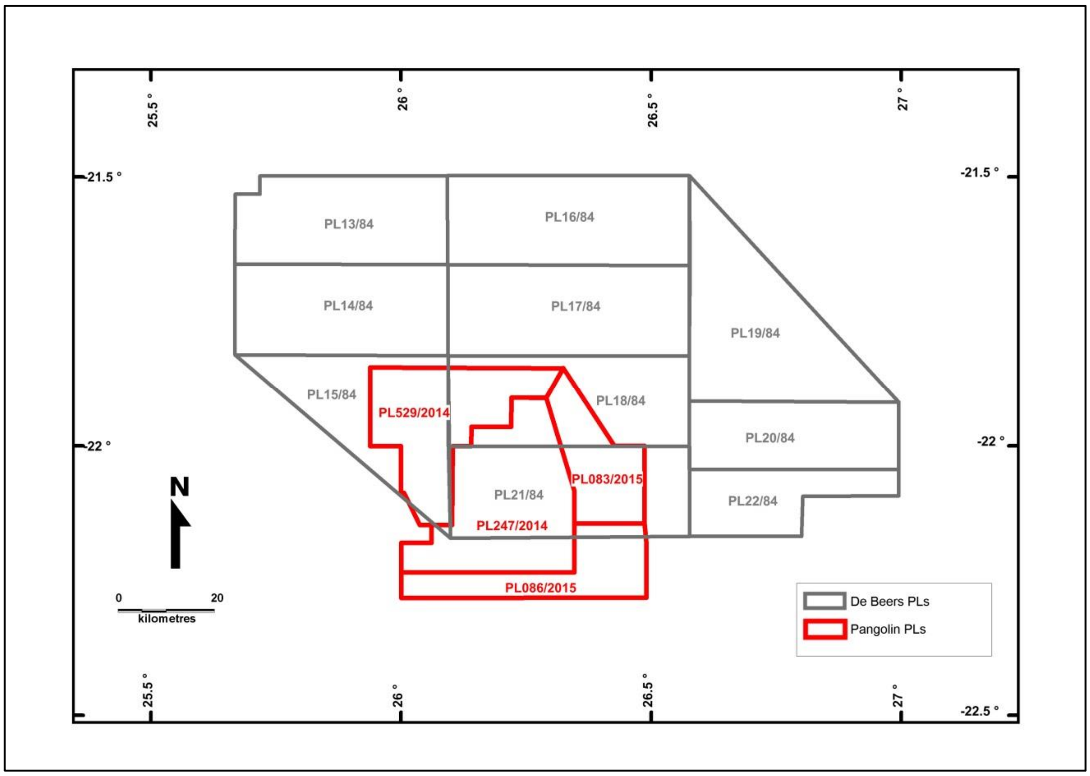


**Figure 2. Overlap of Malatswae Property with De Beers Makoba Block**

### *6.1.1 Reconnaissance Sampling by De Beers*

The De Beers exploration approach, in what was then virgin ground, was to use their classic method of systematic soil sampling for kimberlite indicator minerals, starting with reconnaissance cover of the entire licence block, with subsequent more detailed follow up of positive sites. Selected areas within the licence block were covered by low level, fixed wing, aeromagnetic surveys.

De Beers carried out reconnaissance soil sampling on a 1 km x 1 km grid using the semi-continuous scoop method. This covered all of the Malatswae Property except for most of PL 86/2015 and the southern part of PL 247/2014 (Figure 2). A small number of ilmenites with remnants of original grain surface (ñrosò) were recovered from within the Malatswae

Property together with rather more numerous garnets. The garnets were mostly found in the northwest of Pangolinós licences. No sample returned more than two garnets but some original surface remnants were observed. Later sampling by African Diamonds and by Pangolin has confirmed the dominance of garnet in the north, with low counts of ilmenite in the south.

#### *6.1.2 Detailed Sampling*

De Beers followed up positive reconnaissance sampling within the Malatswae Property with two detailed grid loaming (DGL) blocks, both within their PL 21/84. The blocks, numbered 21/84/1 and 21/84/2, were sampled on 400 m x 400 m grids using a 0.4 mm bottom screen cut-off. Their positions are shown against later Pangolin sampling on Figure 9 below. Grid 21/84/1 was selected because of three chrome diopside grains found in reconnaissance, but these were not confirmed by the DGL which returned a wide scatter of garnets with a few ilmenites. Grid 21/84/2 was based on some scattered ilmenites in reconnaissance, but the DGL did not confirm any significant anomaly. Individual sample grain counts were very low, but many grains showed remnants of original surfaces.

De Beers concluded that the sampling results within what is now the Malatswae Property were of low interest. No geophysical surveys or drilling were done within the Property.

Although the individual sample grain counts from the DGL were low, the proportion of grains having original surfaces seems unusually high. As will be discussed below, the pattern of low counts but proximal surface textures has been repeated in the Pangolin sampling programs.

### 6.2 Auridiam NL

In June 1994 the area of the Malatswae Property was granted to Auridiam NL under portions of PLs 38/94, 39/94, 84/94 and 85/94.

### 6.3 Diamond Ventures NL – Auridiam Joint Venture (The Mmashoro Project)

In 1997 the area was taken under PLs 63/97 and 64/97 by Diamond Ventures NL. Diamond Ventures entered into a joint venture with Auridiam, the joint venture being termed the ñMmashoro Projectò.

An aeromagnetic survey with a relatively wide line spacing of 350 m was flown over part of the area. Magnetic targets were selected and followed up on the ground with magnetic surveys and soil sampling. Some indicator minerals, predominantly garnets, were recovered, and a limited drilling program on magnetic targets was done in late 2001. No kimberlite was intersected.

### 6.4 Kukama Exploration Company (Pty) Ltd (later African Diamonds plc)

The Malatswae Property was covered by portions of Kukama Explorationós licences 3/2000, 8/2004, 9/2004, 49/2004 and 50/2004.

Kukama carried out reconnaissance sampling on a 1 km x 1 km grid over what is now the northern part of Pangolinôs PL 529/2014. These results (the ñMMò series samples) have been incorporated into the Pangolin database (Figure 8 below).

The indicator minerals recovered in the ñMMò series reflect the previous work by De Beers in that they are predominantly garnet, with ilmenite being only a minor component. Some of the garnets were found to have surface textures indicative of a proximal source. Suites of garnets were analysed by electron microprobe and found to have compositions distinct from the compositions of garnets typically found in the Orapa area. Interpretation of the garnet data led Kukama to the conclusion that the garnets were derived from as yet unknown kimberlite sources, and that these sources were likely to be diamondiferous.

In addition, Kukama sampled a 5 km x 5 km area in the north of PL 247/2014 at 200 m x 200 m spacings. This grid partially overlaps with De Beers grid 21/84/1, and is shown on Figure 8.

## 6.5 Aeromagnetic Survey by Geological Survey Department

In 1988 the Property was covered by an aeromagnetic survey commissioned by the Botswana Geological Survey (Figure 6 below). The survey was flown with north ï south lines at 250 m spacings.

The data is public domain and has been acquired by Pangolin, and interpreted to identify potential kimberlite targets.

## 6.6 Summary of Historical Exploration Programs

The area of the Malatswae Property attracted intermittent interest from exploration companies over a period of 20 years. The historical work identified an area in the north of the Malatswae Property where fairly high counts of kimberlitic garnet, but only very rare ilmenite, were found in the soils. The garnet counts can be followed to the northwest into the Orapa Kimberlite Field, and were often regarded as a distal spread from the Orapa kimberlites. However surface texture and mineral chemistry data cast doubt on this interpretation.

The south and central of the Malatswae Property attracted rather less interest, with only occasional recoveries of indicators. However some grains showed proximal surface textures, and chrome diopsides were among the grains recovered.

Historical exploration drilling was limited, and based on the testing of aeromagnetic targets (Figure 3).

The historical exploration results are not especially positive, but there was insufficient detailed work to rule out the presence of kimberlite within the Malatswae Property.

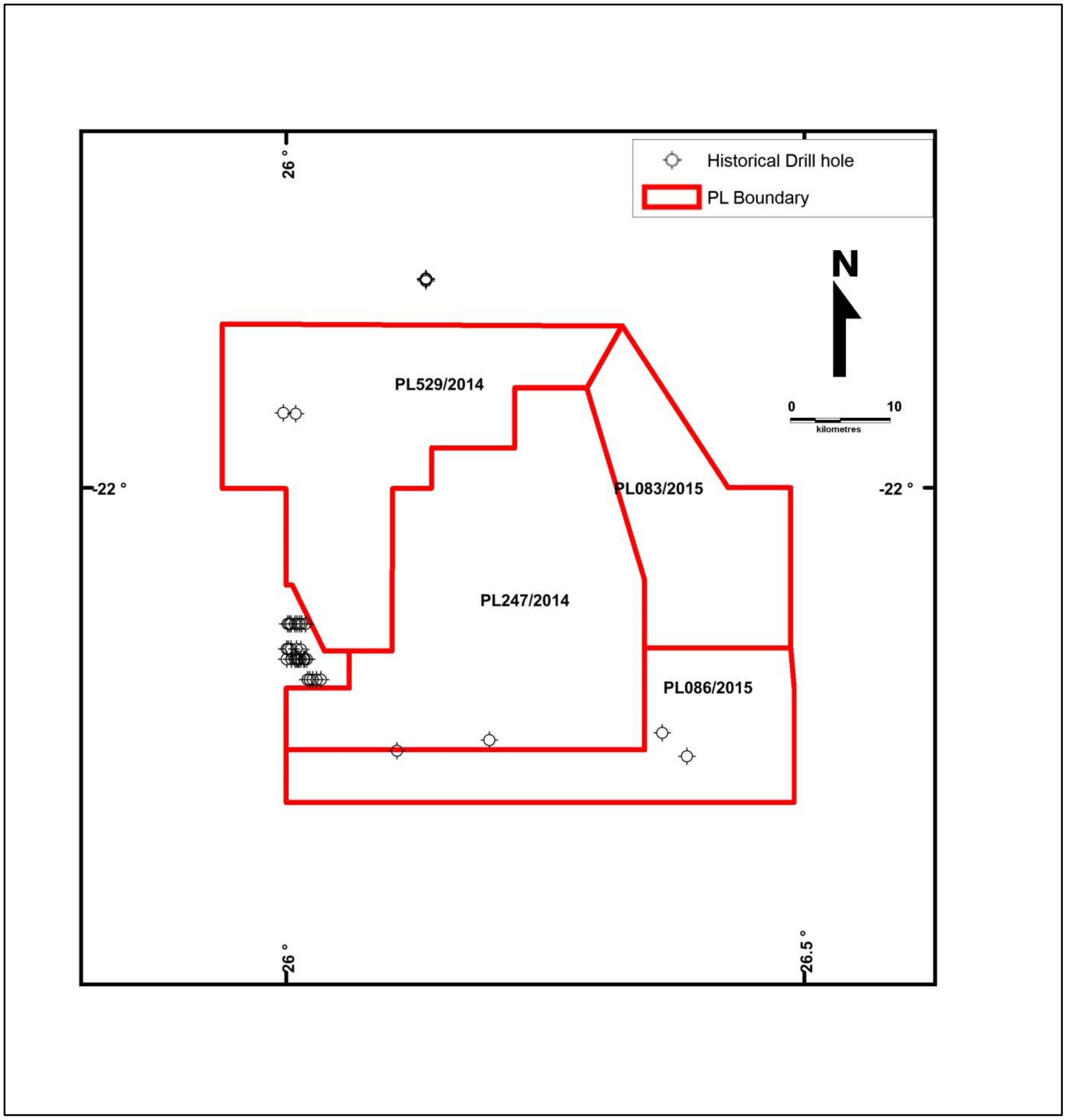


**Figure 3. Historical exploration drilling within and adjacent to the Malatswae Property**

# 7 GEOLOGICAL SETTING AND MINERALISATION

## 7.1 Regional Geology

The only published geological mapping of the Malatswae Property is the national geological map at 1:1,000,000 scale. The standard 1:125,000 quarter degree sheet coverage does not extend into the Property.

The Property lies within the Kaapvaal ï Zimbabwe Craton and the country rocks are clastic sediments and basaltic lavas of the Karoo Supergroup. The bedrock is however completely concealed by partially consolidated terrestrial sediments of the Cenozoic Kalahari Group which may be up to 65 m thick, but usually less. The soil is aeolian sand of Pliocene to Recent age.

The regional stratigraphic succession is as in Table 3 below.

**Table 3. Stratigraphic Column for the Malatswae Property**

| STRATIGRAPHIC COLUMN FOR THE MALATSWAE PROPERTY | | | | |
|---|---|---|---|---|
| **Lithology** | **Formation** | **Group** | **Supergroup** | **Age** |
| Sand, ferricrete, calcrete, silcrete, semi-consolidated sandstone | | Kalahari | | 0.1 ï 80 Ma |
| Kimberlite diatremes and dykes ? | | | | ~93 Ma |
| Basalt lavas, dolerite dykes and sills | Stormberg | | Karoo (total thickness ~600m) | 180 Ma |
| sandstone | Ntane Sandstone | Lebung | | ~200 Ma |
| Red mudstones | Mosolotsane | | | |
| Grey siltstones | Tlabala | Beaufort | | |
| Carbonaceous mudstones, coal and siltstones | Tlapana | Ecca | | |
| Arkosic sandstones | Mea Arkose | | | ~300 Ma |
| shales | Tswane | Dwyka | | |
| Tillite, shales | Dukwi | | | ~320 Ma |
| Granite, granitic gneiss, amphibolite, meta-sediments | | | Motloutse Complex | >2,000 Ma |

### *7.1.1 Pre-Karoo Basement*

The pre-Karoo basement at Malatswae is unknown but inferred to be high grade gneissic terrain of the Motloutse Complex, Limpopo Mobile Belt. Rocks of the Limpopo Belt are well exposed to the east of the Karoo Basin and consist of various granites, granitic gneisses, amphibolites and meta-sedimentary relics. The Belt has a tectonic history pre ~2,000 Ma but is now considered to be essentially cratonised (Carney et al 1994).

### *7.1.2 The Karoo Supergroup*

The Karoo Supergroup is a succession of mainly terrestrial sediments which occur widely over southern Africa, but in a number of now separate basins. The rock successions within the basins generally correlate quite well. The Malatswae Property is within the eastern part of the Central Kalahari Karoo Basin (Smith 1984). This basin underlies most of central

Botswana, and extensive coal deposits occur along its eastern margin, including the coal mine at Morupule.

The oldest rocks of the Karoo Supergroup, the Dywka Group, are glaciogenic sediments including massive tillites at the base followed by varved shales. The development of the Dykwa is variable and in the east Central Kalahari is generally poor, with the unit being thin or even absent in some areas. Its presence at depth at Malatswae is unknown.

The glaciogenic rocks are followed by the Ecca Group, which includes the coal measures, and often thick sequences of carbonaceous shale. The coal is present at depth at Malatswae.

Non-carbonaceous shales of the Thlabala Formation succeed the Ecca Group, and are in turn unconformably overlain by red beds and aeolian sandstones of the Lebung Group.

The total thickness of the Karoo sedimentary succession at Malatswae is not known, but can be reasonably estimated to be ~600 m. The rocks are almost flat lying with a very gentle dip to the west or southwest.

The Karoo rocks are very poorly fossiliferous therefore dating is somewhat problematic. The Dwyka Group is of Upper Carboniferous age, whilst the coals of the Ecca Group are Permian. The overlying Thlabala Formation and Lebung Group are Permian to Triassic in age.

The sedimentary succession is overlain unconformably by basaltic lava of the Stormberg Lava Group. These are of Jurassic age, ~180 Ma, and place a minimum age for the upper Karoo sediments.

#### *7.1.3 Stormberg Lava Group*

The Stormberg lavas are generally grouped with the underlying sedimentary succession as part of the Karoo Supergroup. However the lavas are unconformable on the sediments, although they have a spatial relationship. In central Botswana the thickness of the basalts is very variable, which is a function of WNW-ESE faulting. At Malatswae the basalts form the bedrock over almost the entire Property but are thin and, in a few places, absent (Figure 5 below).

Related to the basalts but slightly younger is a suit of dolerite dykes and sills, sometimes termed the Okavango Dyke Swarm. Dykes trending WNW-ESE are very clear on the aeromagnetic image (Figure 6). Drilling at Malatswae has shown that the dolerites are quite widespread and occur as sills as well as dykes.

#### *7.1.4 Kimberlite*

No kimberlite is as yet known from the Malatswae area. However the Property lies only some 40 km south of the Orapa Kimberlite Field, which has supported up to five diamond mines. The Orapa kimberlites are of Cretaceous age, and thus intrude all of the above units, but are overlain by the Kalahari Group. Figure 4 shows the position of the Malatswae Property against the locations of most known kimberlite intrusions, of all ages, in Botswana.

Pre Cretaceous kimberlites are known in Botswana, for example the Jwaneng kimberlite is of syn-Karoo age (Permian) and kimberlites at Lerala, in the east, are of either Cambrian or Late

Proterozoic in age. The possibility of syn-Karoo kimberlite at Malatswae cannot be discounted, and is considered below.

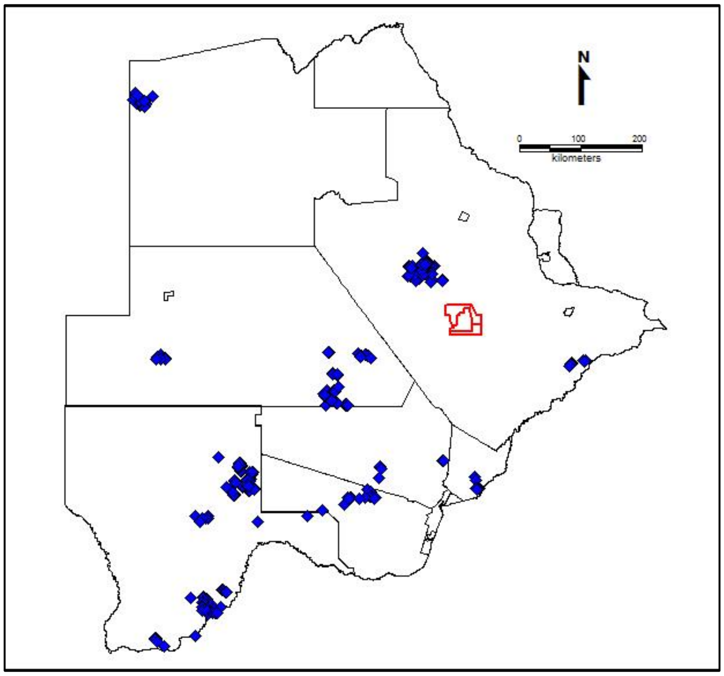


**Figure 4. Positions of most known kimberlites in Botswana and of the Malatswae Property**

#### *7.1.5 Kalahari Group*

The Kalahari Group is the most extensive geological unit in Botswana and has a very wide distribution covering the area of northern South Africa, much of central Botswana, Namibia and extending into Zimbabwe and western Zambia. It consists of terrestrial deposits of aeolian, fluvial or lacustrine origin with the oldest beds being perhaps of Upper Cretaceous age. Aeolian processes appear to have been dominant (Thomas 1987). In east-central Botswana it consists mainly of a blanket of unconsolidated aeolian sand lying with possible unconformity on partially consolidated sand of possible fluvial derivation. There is a widespread duricrust horizon at the base of the surface sand, marking an ancient erosion surface. This often consists of calcrete overlying a thin hard silcrete horizon, although many variations in succession occur.

### 7.2 Local and Property Geology

As described above, there are no bedrock exposures within the Property. The surface is made up of reddish to grey wind-blown sand. Limited borehole data from within the Property indicates that the Kalahari Group is variable in thickness because of pre-Kalahari topography. Most of the licence is underlain by basalt, but in places the basalt is absent, and the Kalahari Group lies directly on the Ntane Sandstone. The absence of basalt may be due to pre-Kalahari erosion or faulting or both. Where the basalt is absent, the Kalahari Group is up to 65 m thick, whereas over basalt the Kalahari Group is generally approximately 20 m thick. This suggests the basalt occurs as erosional mesa like remnants which stand some 40 m above the intervening valleys. There is a silcrete ï calcrete duricrust horizon on the bedrock surface. Ferricrete also occurs at shallow depth within the Kalahari profile and occasionally at outcrop, and has been exploited in the construction of the Serowe ï Orapa road.

The contact between the Ntane Formation and the basalt is a well known aquifer, considered the most productive in Botswana.

The area is marked by WNW ï ESE faulting which is also the trend of the numerous post-Karoo dolerite dykes which are conspicuous on the aeromagnetic data (Figure 6). The faulting creates horst and graben structures which influence the thickness of the basalt. Some of this faulting may be syn-Kalahari Group and affects the thickness of the Kalahari Group also.

The dykes are the southern members of the Okavango Dyke Swarm and they and their associated parallel faulting are important in the emplacement of kimberlite. The Orapa Kimberlite Field, and the Mambali kimberlites in Zimbabwe, are intruded into the Okavango Dyke Swarm. The distribution of kimberlite pipes in the Gope area, to the southwest of Malatswae, shows structural control by WNW ï ESE faulting parallel to the dyke trend.

### 7.3 Mineralisation

There are no known mineral occurrences within or immediately adjacent to the Malatswae Property. No kimberlite bodies are known within the Property, the closest being 39 km to the NNW.

Coal is present at depth, and drilling for coal bed methane has been done in the area. Although gas has been found, no commercial production has taken place.

### 7.4 Implications of Geology for Diamond Exploration

The geology of the Malatswae Property and surrounding areas has a number of implications for diamond exploration:

1. The cratonised tectonic setting is favourable for diamond bearing kimberlites. The Orapa Kimberlite Field to the northwest, and the Gope Field to the southwest, include diamondiferous kimberlites which are currently being mined.
2. The ubiquitous sand cover, lack of exposure and lack of topography and drainage restrict the sampling methods which can be applied. Sampling for kimberlite indicator minerals can only be done on loam sampling grids. The Kalahari sand cover reduces the indicator mineral counts at surface, and often results in anomalies being diffuse and displaced from their source kimberlites. That said, soil sampling techniques suitable for the Kalahari environment have been developed and proven to be very effective.
3. The presence of ferricrete and calcrete in the Kalahari Group profile may have led to the destruction of silicate minerals, especially garnet. The counts of kimberlitic garnet in soils may therefore be reduced.

4. The basalt bedrock has a noisy magnetic signature, and is the cause of magnetic and gravity anomalies which may mimic those expected from kimberlite diatremes. Historically, drilling for kimberlite based solely on geophysical targets within the basalt areas of central Botswana has had a low success rate. Target selection is best done by a combination of geophysical and sampling techniques.

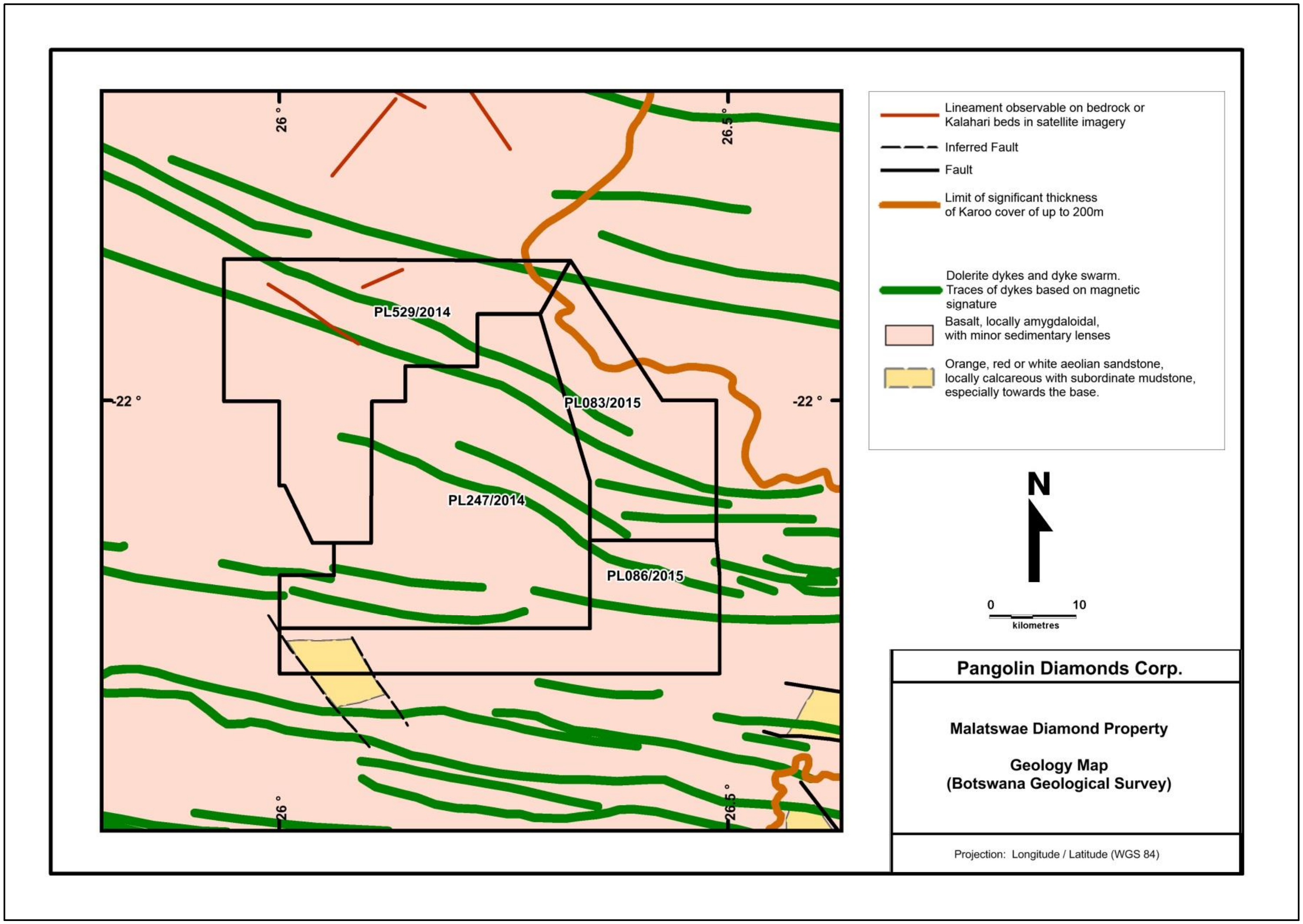


**Figure 5. Malatswae Diamond Property, solid geology**

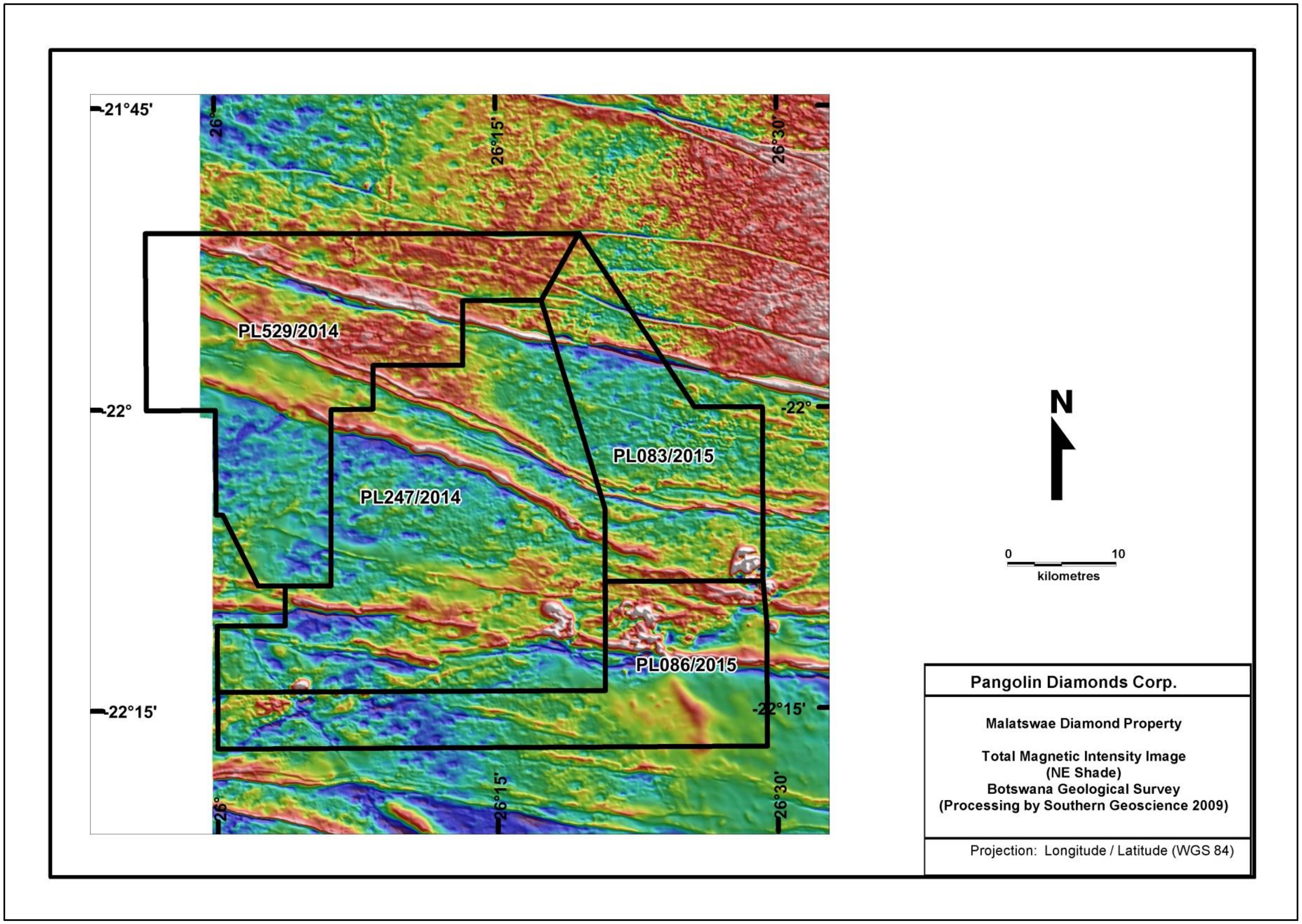


**Figure 6. Malatswae Diamond Property. Aeromagnetic map (from Botswana Geoscience Institute)**

# 8 DEPOSIT TYPES

The exploration target is primary diamond deposits, that is, diamond contained in kimberlite diatremes (ñpipesò) or dykes.

The majority of kimberlite intrusions in Botswana are of Cretaceous age and therefore intrude all of the rock units in the Property except for the Kalahari Group sediments. However pre-Cretaceous kimberlites occur in Botswana, but if present at Malatswae would be more difficult to detect.

The location of kimberlite intrusions is impossible to predict on the basis of geology alone. Soil sampling for indicator minerals, geophysical surveying and drilling are needed to generate and prove kimberlite targets.

It is well known that the majority of kimberlite intrusions contain diamonds in only sub-economic quantities. Economically exploitable kimberlites are rare. Kimberlite pipes are typically small bodies, often with surface areas of <10 ha, although a few very large pipes of >100 ha surface area are known.

Kimberlites, especially pipes, are often composite and are made up of several different kimberlite lithologies or ñfaciesò which have been intruded during successive eruptive episodes, so that one may cut into the other. The diamond grade and quality of diamonds may vary between different facies and lithologies, therefore a good understanding of the kimberlite bodies and lithological controlled sampling are important in their evaluation. Kimberlite facies may vary in the proportion of country rock xenoliths they contain, which impacts on the grade through dilution. They may also vary in metallurgical properties, resulting in varying plant efficiencies.

Kimberlite dykes usually occur as dyke systems or groups of en echelon or anastomosing lenses which pinch and swell along strike. Dykes are often near vertical and narrow, <1 m in width, but may be traceable for several kilometres along strike. Whilst dykes may carry very high grades, and their grades tend to be fairly uniform along strike and down dip, their tonnage potential in inherently limited, and they can only be exploited by underground mining.

No exploration for alluvial diamond deposits is being considered at the present time.

# 9 EXPLORATION

## 9.1 Previous Pangolin licences at Malatswae

Pangolin previously held PLs 561/2009 and 562/2009 which partly overlap with the present Malatswae Property (Figure 7). These were not renewed on expiry in 2012, but were succeeded by PLs 247/2014 and 529/2014.

Pangolin also previously held PLs 063/2011, which lay to the north of PL 561/2014, and PL 100/2011 which lay to the west of PL 247/2014 (Figure 7). PL 100/2011 was prospected for possible alluvial diamonds in channels in the basal Kalahari Group. PLs 063/2011 and 100/2011 lapsed on 30 June 2016 and no renewal applications were submitted.

Pangolin report (Dr L Daniels *pers comm*) that the first diamond in the area of the MSC grid was found in samples collected under PL 562/2009 but not processed before the licence lapsed (sample MSC-119). This prompted the re-application for the area, now PL 247/2014.

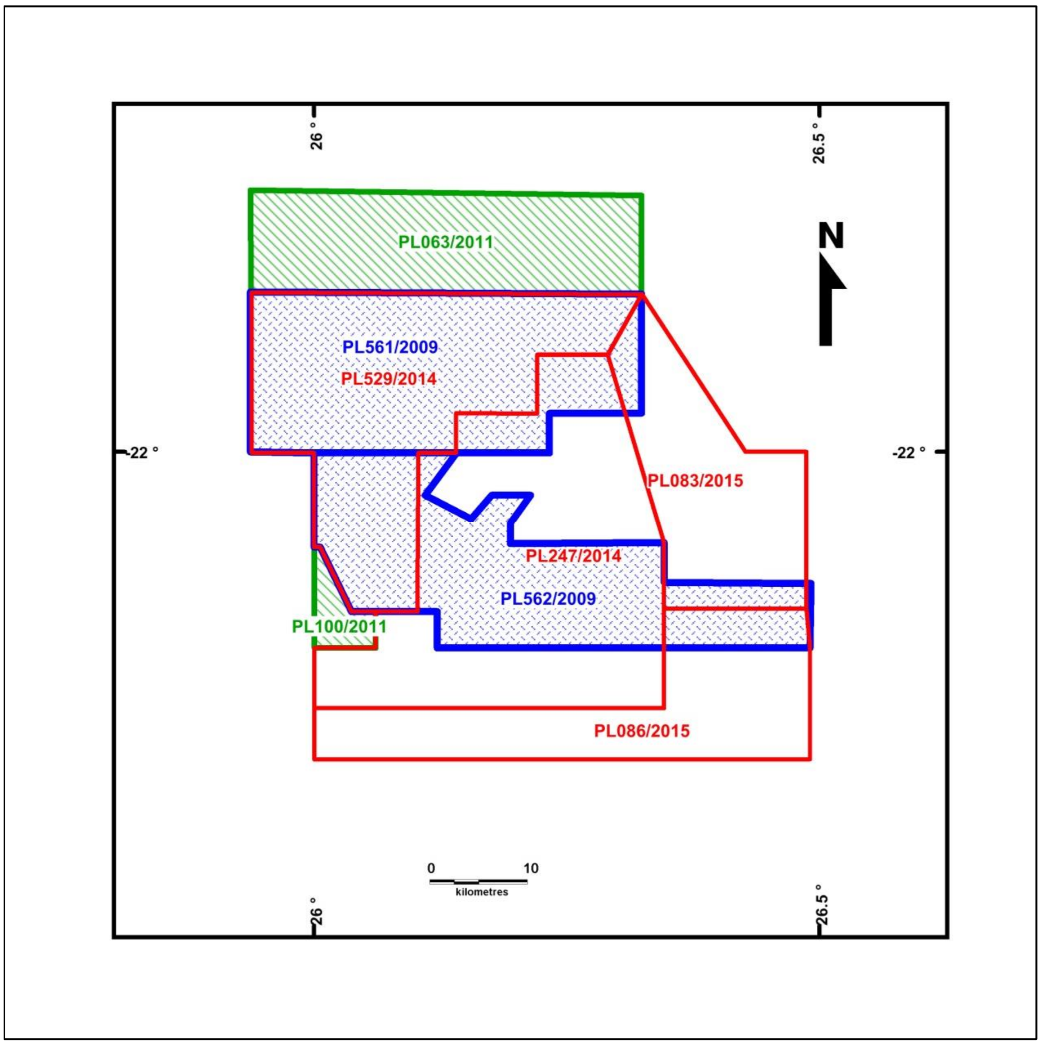


**Figure 7. Historical Pangolin licences at Malatswae**

## 9.2 Exploration Approach

Pangolinôs exploration approach has been based primarily on soil sampling for kimberlite indicator minerals. As discussed in Section 6 above, there is a historical database of soil sampling data, including positive results. Soil sampling has been supplemented by the interpretation of government aeromagnetic data, ground magnetic and gravity surveys, experimental soil geochemistry and with other geophysical methods (ground penetrating radar (GPR) and controlled source audio-magnetotellurics (CSAMT)). Borehole siting to date has been largely based on geophysical targets proximal to indictor mineral recoveries.

The company has carried out very extensive soil sampling and to date the complete record of the soil samples, both historical and by Pangolin, totals over 5,000 records from within the Malatswae Property (Figure 8).

Pangolin has set-up its own laboratory facilities for the treatment of soil samples and recovery of indicator minerals (ref Section 11 below). Ground magnetic surveys are done by Pangolin staff whereas other geophysical methods are carried out by contractors.

## 9.3 Kimberlite Indicator Minerals

Indicator minerals are minerals, often, like diamond, of mantle origin and thus xenocrystic, which occur in kimberlite in much higher abundances than diamond and which may be used as pathfinders to their source kimberlites. The most commonly employed indicator minerals are picroilmenite (a black iron-titanium oxide) and garnet (a reddish silicate). Like diamond, these minerals have relatively high densities and thus concentrate in particular locations in soil and stream sediments. They are also largely resistant to destruction during transport by water or wind, and can thus survive to travel long distances from their source kimberlites. Other indicators typically present are chrome diopside, a green silicate which unlike garnet and ilmenite does not survive well in the secondary environment and is often taken as pointing to a nearby kimberlite source, and spinels, which are oxides of iron and chrome. Spinel grains are usually small, <0.4 mm across, and thus the not recovered unless a very fine fraction of the soil is examined. Diamond may also serve as an indicator, although due to its ability to survive multiple cycles of erosion, it is of doubtful significance unless multiple grains are found.

Indicator minerals have been used in diamond prospecting since the 19$^{th}$ century. However in the last 40 years the chemistry of indicator minerals, as measured by electron microprobe, has been used to estimate the diamond potential of their source kimberlite, it being well known that the majority of kimberlite bodies do not contain diamond in economic quantities. There is considerable science behind this, and research is on-going into the correlation between indicator mineral chemistry and kimberlite diamond content. Indicator mineral chemistry can also serve to ñfingerprintò minerals derived from a particular kimberlite. The role of indicator minerals in providing a grade prognosis for their source kimberlites is of proven value, although not infallible. It is often used to decide whether continued exploration is warranted or not. In addition, studies of the surface textures of minerals found in soils can provide good indications of how far mineral grains have been transported in the secondary environment. Surface texture studies have been prominent in the Pangolin programs.

## 9.4 Reconnaissance Soil Sampling

Pangolin has collected reconnaissance sampling data for most of the area of PL 247/2014 (the ñMALò series samples) at a sample spacing of 1 km x 1 km, collecting over 600 samples (Figure 9). This complements the historical dataset from Kukama Exploration which covers PL 519/2014 to the north (the ñMMò series samples). Sampling of PL 247/2014 under the ñMALò series is currently being extended southwards to complete coverage of the Licence.

It is understood that Pangolin is currently extending reconnaissance sampling to PLs 083/2015 and 086/2015 but no results are available as of the date of this report.

**Table 4. Malatswae Property, summary of reconnaissance sampling**

| PL No | Sample Series | Spacing | Lower cut-off | Date |
|---|---|---|---|---|
| 247/2014 | MAL | 1 km x 1 km | 0.425 mm | 2014, currently being completed |
| 083/2015 | in progress | 1 km x 1 km | 0.425 mm | 2016 |
| 086/2015 | in progress | 1 km x 1 km | 0.425 mm | 2016 |
| 529/2014 | MM | 1 km x 1 km | 0.425 mm | historical |

### *9.4.1 Sample Collection Methodology*

As the Malatswae Property has no surface drainages the only medium to sample is the sandy soil. Samples are taken from the uppermost 2 cm of the sand profile. This is collected by scooping with a spade. It is generally believed that wind deflation concentrates the heavy minerals at the near surface. Samples are collected from patches of visibly coarser sand which may be seen, for example, beneath bushes. Soil is taken selectively within a 50 m radius of the nominal sample point and screened as discussed in 9.3 above.

Typically the surface sand is collected until the sample totals 20 - 40 litres of sand. This is then dry sieved by hand at the point of collection to collect the -2 mm + 0.425 mm fraction, undersize and oversize being discarded. In the Kalahari very little, other than organic matter, reports to the +2 mm fraction. Sample positions are fixed by simple GPS units, thus recorded sample positions can be expected to be accurate to ±9 m or better. The sample collection is generally supervised by a semi-skilled technician.

### *9.4.2 Sample Processing*

Samples are taken from the field to Pangolinôs Francistown facility which is described in Section 11 below.

### *9.4.3 Indicator Mineral Picking*

This is described in Section 11 below.

### *9.4.4 Reconnaissance Results*

Grain counts from the MAL samples are generally low. Figure 9 shows the occurrence of ilmenite, garnet, chrome diopside and diamond. A single diamond was found in sample MAL 157, an octahedron with dimensions 0.89 mm x 0.81 mm x 0.58 mm (Photo 1). This diamond, weighing 0.02 ct, is significant in terms size and lack of obvious wear, although there are no features to conclusively state that it is derived from a proximal igneous host rock (McCandless 2015(1)).

**Photo 1. Diamond from sample MAL-157**

Samples MAL 001 to MAL 025, which lie along the northernmost line of the grid, returned the largest and most abundant ilmenites in the MAL grid (Figure 9). Their surface textures are strongly suggestive of proximal derivation, and some have secondary material attached to them that is remnant kimberlitic rock. A few silicates are also reported with these samples, including pyrope with remnant kelyphite, and altered chrome diopside. Collectively the morphologies suggest that these grains are proximally derived from the weathering of one or more kimberlites which were exposed to tropical weathering conditions (McCandless 2015(2)).

However the results from samples MAL 001 ï 025 have been checked by Pangolin through repeat sampling, and reproducibility has been very poor. Further repeat sampling is planned, and conclusions on these high interest results must await the outcome of this work.

The remainder of the MAL samples returned occasional single grains of picroilmenite (McCandless 2015 (2)). In addition to kimberlitic picroilmenite, basaltic ilmenites were also recovered but can generally be distinguished visually from the kimberlitic grains.

Garnet counts were much lower than for ilmenite, with garnet being absent except for a few single grains in the north (Figure 9).

## 9.5 Detailed Soil Sampling

Pangolin have followed up reconnaissance results with a succession of detailed sampling grids. Most notable are the two sites, termed the MSC grid (PL 247/2014) and MTS grid (PL 529/2014) (Figure 9), over which there has been repeated detailed sampling with the recovery of diamonds and proximal indicator minerals (Figures 10 and 11).

The Pangolinôs detailed grids are summarised in Table 5 below.

**Table 5. Summary of Detailed Soil Sampling grids**

| PL | Sample Series | Spacing | Sample collected from |
|---|---|---|---|
| 247/2014 | MSCa | 200m x 200m | 1 $m^2$. From sites of MSCb + MSCc |
| 247/2014 | MSCb | 200m x 200m | 50 m radius |
| 247/2014 | MSCc | 200m x 200m | 50 cm hole |
| 247/2014 | MSCd | 200m x 200m | 1 $m^2$ + 50 m radius |
| 247/2014 | COB | 500m x 500m | 7km x 2.5km block to N of MSC. Intended to define the limits of the MSC ñanomaly.ò |
| 247/2014 | MSC-DG | 50m x 50m | Two blocks within MSCa grid |
| 529/2014 | MLS | 500m x 500m | Two blocks |
| 529/2014 | MLM | 500m x 500m | |
| 529/2014 | MD | 50m x 50m | Block over MTS target |
| 529/2014 | MTS-DG1 | 50m x 50m | Block over MTS target |
| 529/2014 | MTS-01 | 100m x 100m | Block over MTS target |

#### *9.5.1 Sample Collection Methodology*

The sample collection methods used in detailed sampling are generally the same as for reconnaissance sampling, except that the exact area over which the samples are collected varies between grids, as does the volume of unscreened soil collected. Pangolin has conducted various orientation exercises to determine the best soil sampling methods. For example, in the MSCa grid samples were collected from 1 $m^2$, in the MSCb grid samples were from within a 50 m radius of the nominal sampling point, and in the case of the MSCc grid, samples were taken from a hole 50 cm deep and in the MSCd grid samples were taken over 1 $m^2$ plus material from within a 50 m radius. In the MSC-DG grid the sample size was increased from the usual 40 litres to 100 litres. The lower screen cut-off of 0.425 mm was always retained. It is however not clear that any of the above methodologies is superior to the others.

#### *9.5.2 Sample Processing*

Sample processing is as per the reconnaissance samples, and is described in Section 11 below.

#### *9.5.3 Indicator Mineral Picking*

Picking is as for the reconnaissance samples and is described in Section 11 below.

#### *9.5.4 Detailed Sampling Results*

As with the reconnaissance sampling, indicator mineral counts are generally low. However the MSC and MTS sampling grids have recovered many individual grains which are of high interest and indicative of proximal diamond bearing kimberlite.

##### *9.5.4.1 MSC Grid*

The MSC grid is in the south of PL 247/2014 (Figure 9, Figure 10). As mentioned above, attention was first drawn to the area by the recovery of a diamond during the tenure of

PL 562/2009. The MAL block reconnaissance results show a weak concentration of ilmenite in this area.

The MSC grid covers an area of approximately 3.2 km x 3.6 km. It has been covered by five sampling phases, the first four at 200 m x 200 m intervals (grids MSCa, b, c and d) and finally at 50 m x 50 m intervals (grid MSC-DG).

There are two separate areas of focus within the grid, shown on Figure 10 by the areas of 50 m x 50 m sampling, within which the majority of high interest mineral grains have been found.

The geology consists of ~20 m of Kalahari Group overlying Stormberg basalt. However two boreholes (MSC-003 and MSC-004) (Figure 10) entered Ntane Sandstone beneath >60 m of Kalahari Group, the basalt being absent. Elsewhere the basalt is thin. A dolerite dyke passes through the grid, WNW ï ESE. The thicker Kalahari Group over the Ntane Sandstone has been taken as evidence of a pre-Kalahari palaeo-topography in which basalt mesas stood above a sandstone plain.

Nine diamonds have been found in the MSC samples (Figure 10). In addition, 12 proximal picroilmenites, a single olivine, two pyrope garnets and one garnet attached to a fragment of garnet peridotite (MSCc-154) have been recovered (Photo 2).

The area of the MSC grid has been covered by a detailed ground magnetic survey at 50 m line spacings and a detailed gravity survey. Trial GPR and CSAMT surveys have also been carried out. However neither sampling nor geophysics has yielded clear drill targets.

**Photo 2. MSC Grid; garnet peridotite from sample MSCc-154**

The scrub vegetation in the area of the MSC grid is unusually thick. This may have the effect of limiting the mobility of indicator minerals.

#### *9.5.4.2 MTS Grid*

The MTS grid is situated in the east of PL 529/2014 (Figure 9). Indicator mineral counts are dominated by pyrope garnet, and three diamonds have been recovered (Figure 11). Very detailed sampling at 50 m x 50 m spacing has been carried out, and numerous garnets recovered showing proximal textures and diamond favourable compositions (McCandless 2016). However drilling attempts based mainly on geophysical targets have to date been unsuccessful.

#### *9.5.4.3 Aeromagnetic Target Follow-up*

Pangolin acquired the 1988 aeromagnetic dataset for the Malatswae Property flown by the Botswana Department of Geological Survey (now the Botswana Geoscience Institute). The survey was carried out along north ï south lines at 250 m intervals and with 80 m terrain clearance.

The magnetic data for the Property is difficult to interpret due to the strong and ñnoisyò magnetic response from the underlying basalt country rock. However Pangolin have identified targets from the aeromagnetic data and carried out soil sampling over the magnetic features. No target has as yet warranted drilling.

## 9.6 Summary of Exploration

Although some aeromagnetic targets have been followed up, Pangolin has relied mainly on soil sampling as a primary exploration tool, with geophysical data in a secondary role and used in borehole siting. The company has developed the in-house capability to collect and process samples relatively rapidly. Few junior exploration companies have this ability. Given the basalt bedrock, and consequent problems with aeromagnetic interpretation, the reliance on sampling is appropriate.

The results have however proved difficult to interpret, in that although grains with proximal textures have been found, the counts are rather low. There are also difficulties with the repeatability of some of the sampling data. The relatively frequent recovery of diamonds in the soil is unusual, but given the rarity of diamond, does suggest a proximal source.

Some studies have shown that in the Kalahari environment indicator mineral counts in soil decrease sharply away from the contacts of the source kimberlites (van Coller et al 2004). Close spaced sampling is necessary.

Pangolinôs sampling programs are on-going as of the date of this report.

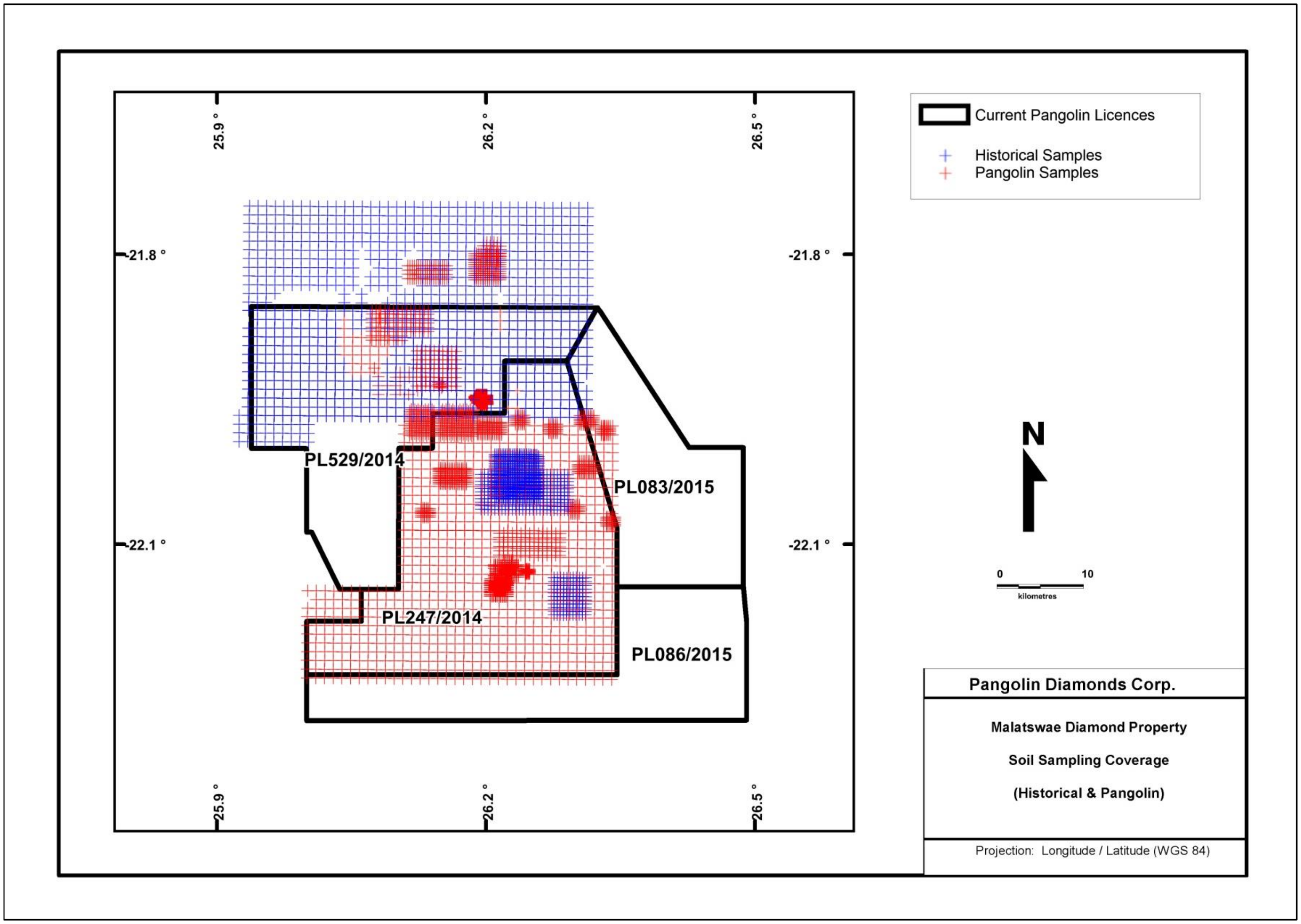


**Figure 8. Malatswae Diamond Property - soil sampling coverage (historical and Pangolin)**

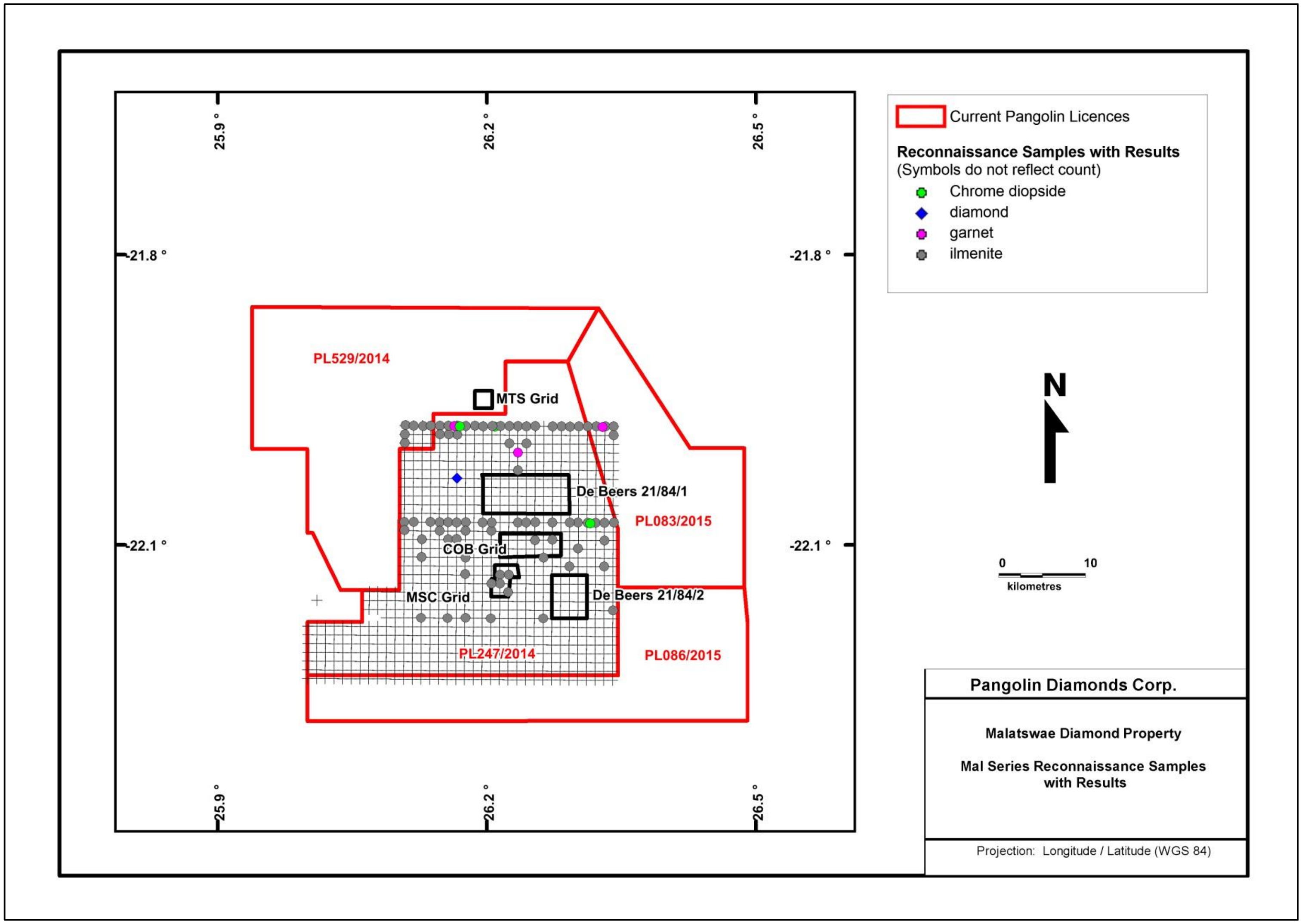


**Figure 9. MAL series reconnaissance samples with results. (**

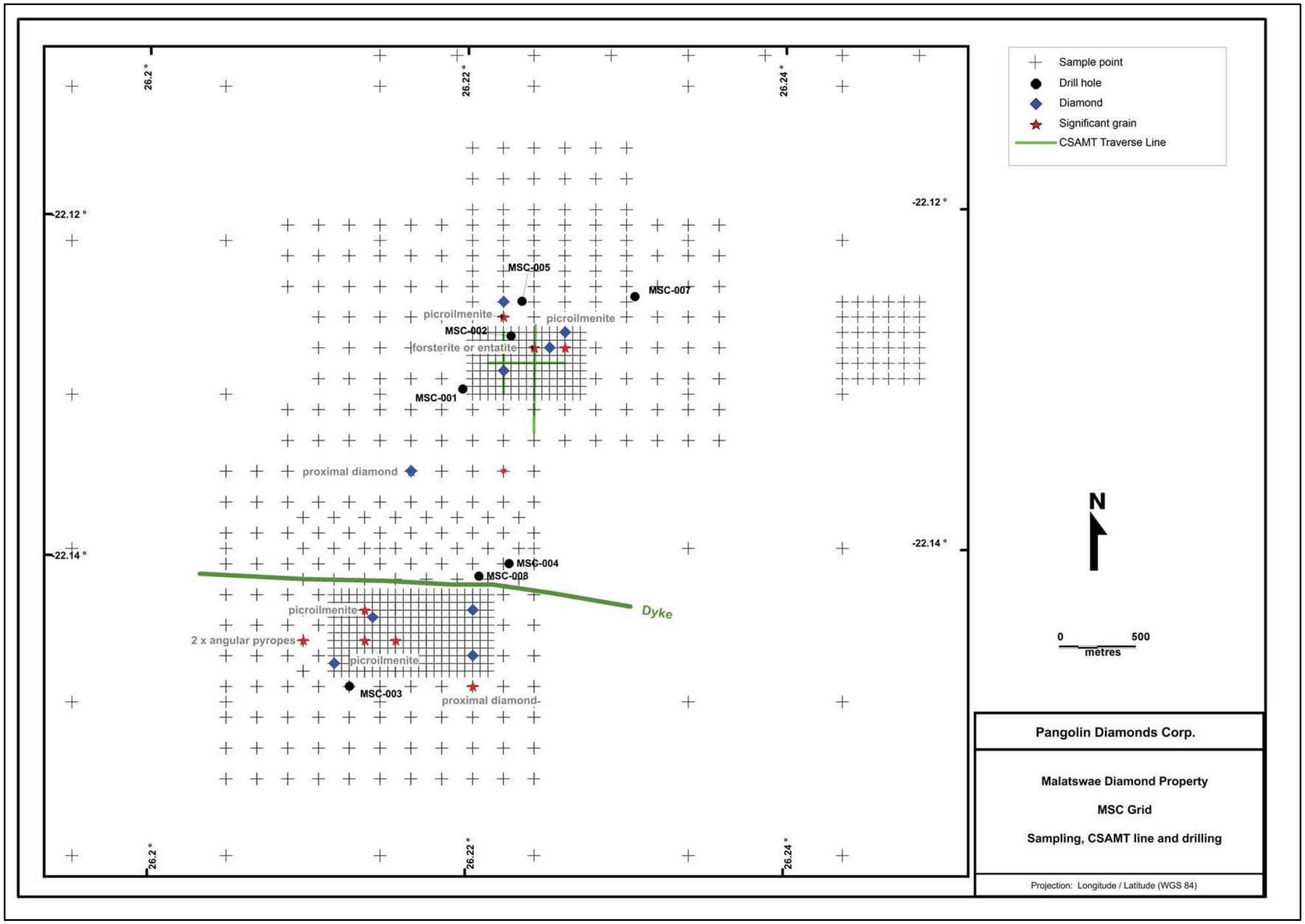


**Figure 10. MSC Grid: sampling, CSAMT and drilling**

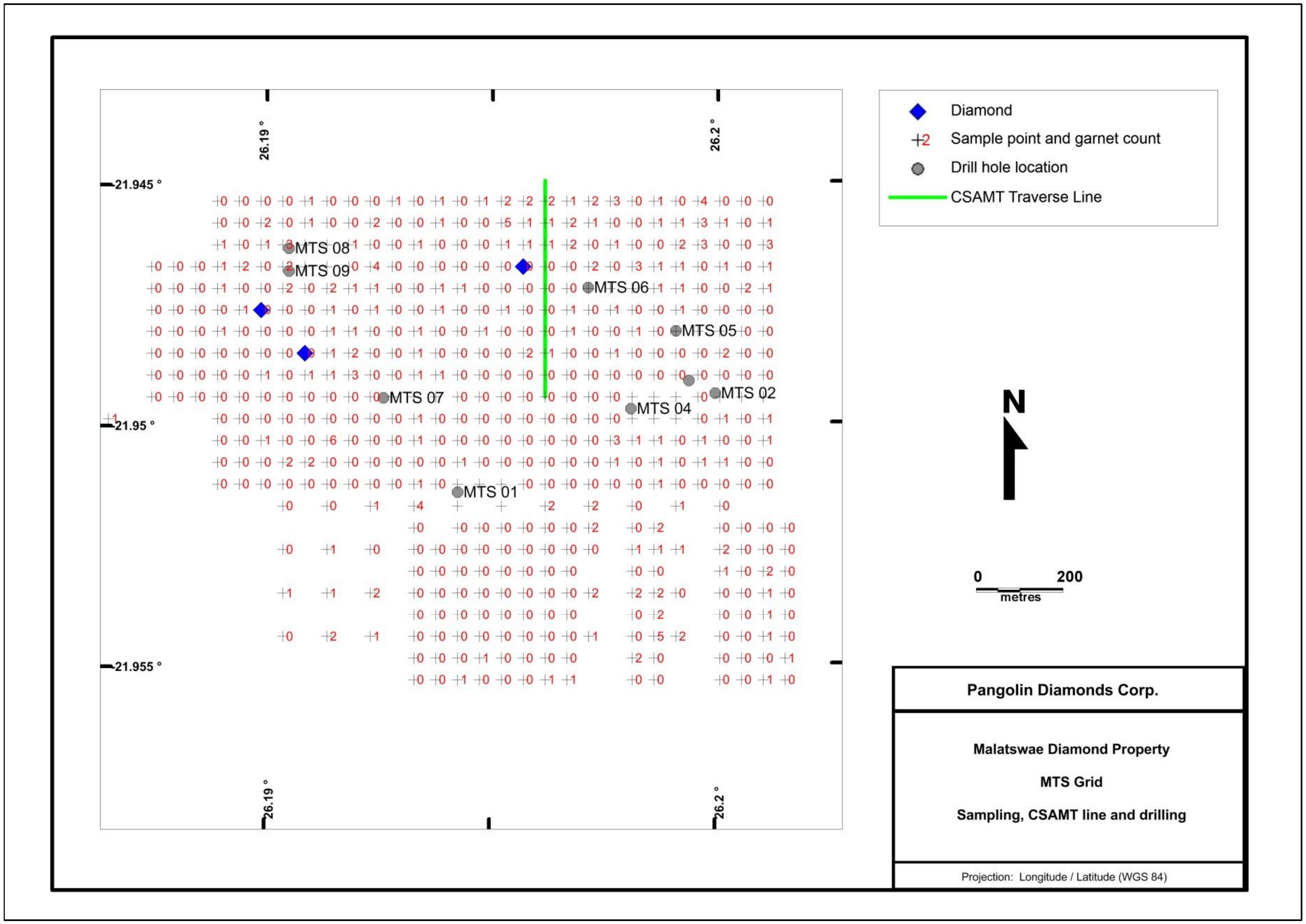


**Figure 11. MTS Grid: sampling, CSAMT line and drilling**

## 10 DRILLING

Limited programs of exploration drilling have been carried out.

1. Two cored boreholes, numbers MSC-001 and MSC-002, were drilled on the MSC grid in 2014 targeting geophysical features adjacent to the sites of proximal indicator minerals (Figure 10). Borehole MSC-001 targeted a gravity low feature marginal to a magnetic high, whilst MSC-002 targeted a magnetic low associated with a northwest trending geological contact. Both holes intersected basalt overlying the Ntane Sandstone Formation.
2. A further five holes were drilled in the MSC grid by air percussion in mid-2015. Again most holes were sited on magnetic and/or gravity data but located in areas where anomalous mantle derived minerals have been found in the soils. Some holes are vertical and some inclined, depending on the target. This drilling method is considered appropriate for the purpose of testing geophysical targets and for first identification of kimberlite. However no kimberlite was intersected.
3. A reconnaissance program of nine percussion boreholes were drilled on magnetic targets in the MTS grid.

The drilling on the MSC grid is summarised in Table 6 below and shown on Figure 10. Drilling on the MTS grid is summarised in Table 7 and shown on Figure 11.

**Table 6. Summary of drilling on the MSC grid**

| Bh ID | type | X | Y | dip & azimuth | EoH | Summary Log |
|---|---|---|---|---|---|---|
| MSC-001 | core | 419535 | 7552531 | -54º to 045º | 144m | 0 ï 12m: sand<br>12 ï 15m: silcrete<br>15 ï 20m: basalt<br>20 ï 43m: basalt<br>43 ï 144m: sandstone |
| MSC-002 | core | 419849 | 7552875 | -50º to 225º | 212m | 0 ï 13m : sand<br>13 ï 22m: silcrete<br>22 ï 82m: basalt<br>82 ï 93m: dolerite<br>93 ï 95m: basalt<br>95 ï 101m: dolerite<br>101 ï 106m: basalt<br>106 ï 111m: dolerite<br>111 ï 153m: basalt<br>153 - 212m: sandstone |
| MSC-003 | perc | 418800 | 7550600 | -90º | 108m | 0 ï 18m: sand<br>17 ï 64m: calcrete<br>64 ï 66m: mudstone<br>66 ï 75m: sandstone<br>75 ï 89m: siltstone<br>89 ï 108m: sandstone |

| Bh ID | type | X | Y | dip & azimuth | EoH | Summary Log |
|---|---|---|---|---|---|---|
| MSC-004 | perc | 419835 | 7551400 | -60º to 210º | 107m | 0 ï 20m: sand<br>20 ï 53m: calcrete<br>53 ï 77m: mudstone<br>77 ï 93m: siltstone<br>93 ï 107m: basalt |
| MSC-005 | perc | 419919 | 7553103 | -60º to 210º | 120m | 0 ï 10m: sand<br>10 ï 26m: calcrete<br>26 ï 55m: basalt<br>55 ï 57m: dolerite<br>57 ï 60m: basalt<br>60 ï 63m: dolerite<br>63 ï 115m: basalt<br>115 ï 120m: sandstone |
| MSC-007 | perc | 420652 | 7553133 | -60º to 45º | 125m | 0 ï 8m: sand<br>8 ï 25m: calcrete<br>25 ï 53m: dolerite<br>53 ï 125m: basalt |
| MSC-008 | perc | 419640 | 7551318 | -60º to 210º | 96m | 0 ï 18m: sand<br>18 - 24m: calcrete<br>24 ï 36m: dolerite<br>36 ï 69m: basalt<br>69 ï 72m: siltstone<br>72 ï 96m: sandstone |

Perc = percussion drilling
co-ordinates: UTM35S, WGS84

The 2015 percussion drilling was done by C S Herbst of Selebi-Phikwe and holes logged by Pangolin staff.

**Table 7. Summary of drilling on the MTS grid**

| | WGS 84 | | |
|---|---|---|---|
| BH ID | UTM X | UTM Y | Comment |
| MTS 01 | 416800 | 7572332 | gravity low |
| MTS 02 | 417390 | 7572559 | aeromag target |
| MTS 03 | 417330 | 7572588 | aeromag target |
| MTS 04 | 417197 | 7572523 | aeromag target (mag high) |
| MTS 05 | 417300 | 7572702 | grain feature |
| MTS 06 | 417099 | 7572802 | grain feature |
| MTS 07 | 416630 | 7572548 | grain feature |
| MTS 08 | 416414 | 7572892 | aeromag target |
| MTS 09 | 416414 | 7572840 | aeromag target |

## 10.1 Borehole Sampling

Samples were collected from drill collars at 1 m intervals and laid out for geological logging. Sample material over each 6 m (the length of a drill rod) was collected and composited, and the sample processed for kimberlite indicator minerals in the same way as for the soil samples (Section 11).

**Photo 3. Drilling of MSC-005, Malatswae**

## 10.2 Water Boreholes

In addition to the holes listed above, Pangolin drilled three water boreholes. These were intended to supply water for future core drilling. The details of the water drilling are given in Table 8.

**Table 8. Water boreholes drilled by Pangolin**

| Bh ID | X | Y | EoH | Summary Log | water strike | PL |
|---|---|---|---|---|---|---|
| MWB01 | 418600 | 7573084 | 100m | 0 ï 26m: Kalahari Gp<br>26 ï 71m: basalt<br>71 ï 100m: Ntane Sdst | 91m | 529/2014 |
| MWB02 | 428985 | 7570202 | 110m | 0 ï 37m: Kalahari Gp<br>37 ï 95m: basalt/dolerite<br>95 - 110m: Ntane Sdst | 98m | 083/2015 |
| MWB03 | 406627 | 7574300 | 60m | 0 ï 25m: Kalahari Gp<br>25 ï 60m: basalt/dolerite<br>*Hole stopped due to compressor failure* | n/a | 529/2014 |

## 10.3 Discussion of Drilling Results

No kimberlite was intersected in any borehole. The drilling results show the property geology, consisting of Kalahari Group sand, sandstone and calcrete to depths ranging from 15 m to over 50 m, overlying a thin layer of Stormberg basalt, which lies on the Ntane Sandstone Formation. The thickest Kalahari Group is recorded where the basalt sheet is absent, either due to pre-Kalahari erosion or to faulting or both. The Kalahari Group has filled in palaeo-valley or graben structures flanked by basalt mesas.

Dolerite was often intersected, mainly as dykes, but evidently as sill-like intrusions also.

The combination of differentially weathered basalt, dolerite and variations in Kalahari Group thickness lead to complex patterns in magnetic and Bouguer gravity results. It is proposed that borehole siting on these geophysical results alone is not appropriate. As far as has been seen, the geophysical targets are not convincing.

## 11 SAMPLE PREPARATION, ANALYSES AND SECURITY

The samples relevant to the Property are soil samples taken for the recovery of kimberlite indicator minerals, and a small number of drill samples. All samples are processed ñin houseò by Pangolin at its Francistown base. This facility was visited by the author on 05 August 2016.

### 11.1 Soil Samples, Field Preparation

Soil samples are sieved at the point of collection to retain the +2 mm ï 0.425 mm fraction, oversize and undersize being discarded. In the Kalahari environment it is expected that very little material will report to the +2 mm fraction. This fraction of the sample typically consists of organic material such as leaves and twigs. Samples are taken to the DMS plant without any further pre-screening or washing.

### 11.2 Concentration

A heavy mineral concentrate is made from the screened sample received from the field by feeding the sample into a 1 tonne per hour dense media separation (DMS) plant (Photo 4). The plant uses ferrosilicon (FeSi) which has a nominal density of 3.2 g/cm$^3$, although this can be varied. The kimberlite indicator minerals ï garnet, ilmenite, chrome diopside, spinel and diamond ï all have densities of 3.4 g/cm$^3$ or greater and will thus report to the heavy mineral fraction.

### 11.3 Analyses

The DMS plant concentrates are subject to visual examination under a binocular microscope. The concentrates are not screened or washed, nor is heavy liquid separation used. In this type of work much depends on the skill of the examiner (often termed the ñpickerò). Pangolin employs one picker who has more than 20 yearsô experience, including being trained and employed by the De Beers organisation. The picker is resident at Pangolinõs Francistown base.

Visually identified kimberlite indicator minerals are extracted from the concentrates and mounted onto cards. If of interest, the minerals are dispatched by courier to Dr Tom McCandless of MCC Geoscience Inc., North Vancouver, Canada. Dr McCandless is an acknowledged expert in diamond exploration, with over 35 yearsô experience and specialising in diamond morphology, indicator mineral morphology and chemistry. Dr McCandless will visually examine the minerals, and especially their surface textures, and provide a report and photographs.

Mineral grains identified visually to be of highest interest may be examined under scanning electron microscope with energy dispersive spectroscopy (EDS) using the facility at the University of British Columbia, Vancouver. The EDS provides chemical data which may serve to confirm whether a grain is kimberlitic or not. The method gives this data quicker and more cheaply that an electron microprobe.

Finally some grains may be selected for microprobe analysis. These are dispatched by Dr McCandless to C.F. Mineral Research Limited, Kelowna, Canada. The results are reported to Pangolin via Dr McCandless.

**Photo 4. Pangolin's 1 tph DMS plant, Francistown**

### 11.4 Security

Samples are under the charge of Pangolin staff from collection until the concentrates are examined. No contract laboratory facilities are used. Samples pending treatment at the DMS plant are kept within a fenced and locked yard.

### 11.5 Diamond FTIR Analyses

In early 2016 Pangolin submitted 11 diamonds recovered from soil samples on the Malatswae Property to Apex Geoscience Ltd, Edmonton, Alberta, Canada, for analysis for nitrogen by Fourier Transform Infrared Analysis (FTIR) (Apex Geoscience 2016). Nitrogen is the most common lattice impurity in diamond and is the basis for the Type classification system of diamonds. Ten of the diamonds proved to be of Type 1, with one from the MSC grid (sample MSC-DG-40) being a Type II. Type II diamonds may be very large and clear and have very high values, thus the occurrence of this type of diamond at Malatswae is encouraging.

The collection submitted included the diamond from MAL-157, seven from the MSC grid and three from the MTS grid.

## 11.6 Discussion

The choice of a 0.425 mm (35 #) lower cut-off is in accordance with common practice for soil sampling in diamond exploration in the Kalahari. It does however greatly reduce the possibility of recovering kimberlitic spinels which are usually <0.425 mm. A lower cut-off 0.3 mm or 0.25 mm would be more effective in collecting spinels, and may increase the total counts of the other indictors recovered.

The DMS method of preparing soil sample concentrate has been used by other explorers in Botswana, including De Beers. Some other companies may prefer to use jigs to prepare the concentrate. Many laboratories will prepare a final heavy mineral separate from the concentrate using a heavy liquid, typically bromoform ($CHBr_3$, density 2.89 g/cm$^3$) or tetra-bromoethane ($C_2H_2Br_4$, density 2.97 g/cm$^3$) before microscope examination of the sample. This is not done by Pangolin, which results in savings in costs and time. Also, bromoform has carcinogenic properties and is a potential health hazard to laboratory staff. Using bromoform would result in a complete separation of the heavy mineral fraction, rather than its concentration. However the DMS concentrates are not prohibitively large thus the omission of heavy liquid separation should not reduce the effectiveness of the Pangolin facility.

Quality control of the DMS plant is by the use of artificial tracers of specific densities which are added to the sample prior to treatment, and which should report to the heavy mineral concentrate. The recovery of artificial tracers is reported to be good, but was not witnessed by the author.

## 11.7 Summary

In the authorôs opinion the sample preparation, security and analytical procedures are adequate and appropriate for the exploration work being undertaken.

## 12 DATA VERIFICATION

The key data for this report is the results of sampling of Kalahari soils for kimberlite indicator minerals. The counts of indicator minerals per sample reported by Pangolin are generally low. In the author's experience, the results of individual soil samples in this environment are notoriously difficult to reproduce, and this may be expected to be especially true in the case of the Malatswae Property where there are no well nucleated, high count anomalies.

Data verification by way of repeat sampling of a selection of sites by iQuest was thus not a practical method of data verification, as the results may very well have been inconclusive.

The consistency between historical data and the results obtained by Pangolin constitutes data verification of a sort. However it is not practical to implement any formal verification procedure within the scope of this Report.

# 13 MINERAL PROCESSING AND METALLURGICAL TESTING

No mineral processing or metallurgical testing has been carried out.

# 14 MINERAL RESOURCE ESTIMATES

There are no mineral resource estimates for the Malatswae Property.

## 15 ADJACENT PROPERTIES

The Malatswae Property is in an area of Botswana currently being explored by a number of companies. Pangolin itself, under its subsidiary Geocontracts Botswana, holds the areas to the north and east of Malatswae (Figure 12).

Other companies active in the area include Manica Minerals Ltd and Atlas Minerals Botswana (a subsidiary of Botswana Diamonds plc). A number of other junior explorers also hold licences in the general area.

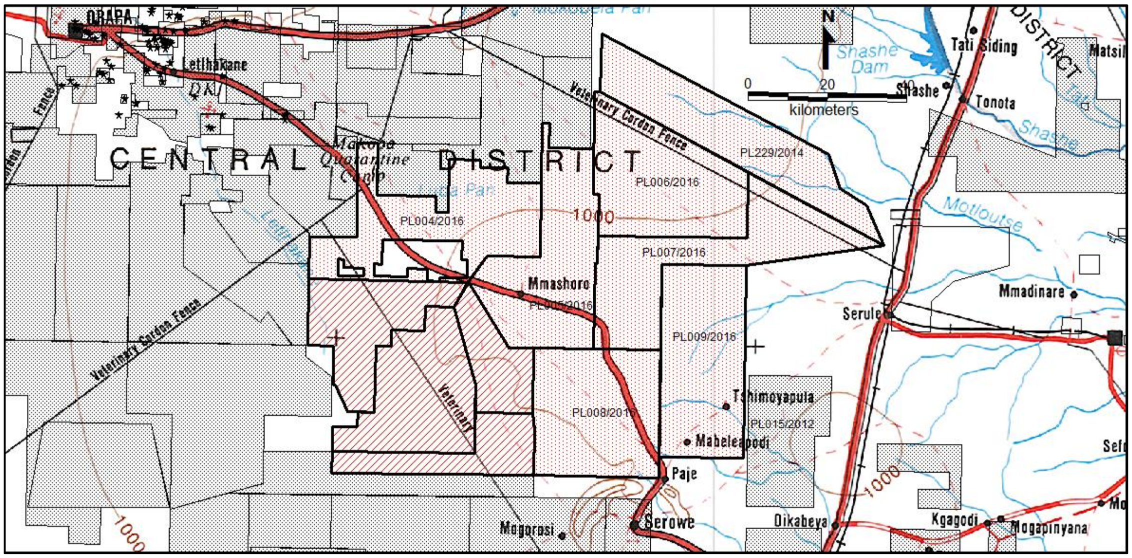


**Figure 12. Properties adjacent to the Malatswae Diamond Property**
(Red pattern = licence held by Pangolin subsidiaries; grey pattern = other diamond exploration licences)

## 16 OTHER RELEVANT DATA AND INFORMATION

There is no other relevant data and information.

# 17 INTERPRETATION AND CONCLUSIONS

i Pangolin has been actively prospecting for diamonds in the Malatswae area since 2009. The main exploration method has been soil sampling, and with the compilation of historical data, the company has a dataset consisting of over 5,000 samples.

ii The results of this work have so far been inconclusive. For the most part, the counts of indicator minerals recovered have been low. However some very high interest grains have been found, including diamonds, fragments of mantle peridotite, chrome diopside and ilmenite with adhering kimberlite. Some of these grains must have a very proximal origin. The indicator minerals in soil, although highly significant, are not present in sufficient numbers to give nucleated soil anomalies which would lead to borehole siting. Also, although broad patterns are clear, in detail it has proved difficult to reproduce soil sampling results.

iii Two restricted areas of frequent high interest indicator minerals finds have been identified ï the MSC grid and the MTS grid.

The MTS grid is dominated by kimberlitic garnet with ilmenite being very rare, suggesting derivation from a Group II (micaceous) kimberlite. The MSC grid on the other hand has both garnet and ilmenite, suggesting derivation of the grains from a Group I (basaltic) kimberlite. There thus appears to be multiple kimberlite sources within the Property. Whilst the number of grains recovered and analysed by electron microprobe is relatively small, the chemistries are favourable for these sources being diamondiferous.

iv Limited drilling has used geophysics, mainly magnetics and gravity, as a borehole siting tool. However the geophysical targets have been chosen because of their proximity to indicator mineral recoveries, not because of their merits as geophysical targets. Most or all would not be chosen on the merits of the geophysical responses alone.

The underlying basalt tends to frustrate geophysical surveys. It makes interpretation difficult by producing ñfalseò anomalies with gravity and electrical data.

v Normally grains with very proximal surface textures would be expected to occur in relatively high abundances, as they are close to their source kimberlite. The Pangolin results thus present a paradox. Better siting will be dependent on getting some resolution of drill targets from soils data, rather than some somewhat forced interpretations of geophysics.

vi A possible explanation for the low grain counts is that the source kimberlite is below the Stormberg basalt, *i.e.* is pre-Jurassic in age, rather than Cretaceous as are the Orapa kimberlites. At present this is speculation, but if it were the case, indicator minerals would tend to be liberated to the surface only where the Ntane Sandstone is at sub-outcrop, as in part of the MSC grid. The basalt is relatively thin, extending to depths of 70 ï 90 m, thus such a scenario would not place the source kimberlite at a depth prohibitive for mining.

vii The company has created an unusual advantage over most other explorers in that it has established an in-house sample processing facility, and trained multiple field sampling teams. Companies without in-house laboratories face a limited choice of commercial laboratories, the costs of which are liable to be a severe constraint on the application of soil sampling, which, in most situations, remains the most effective kimberlite exploration method.

viii It was found however that the Pangolinǿs database of sampling results is in need of editing, as entries may be incomplete, and there are duplications of sample numbers and locations.

ix In conclusion, the Malatswae Property is an intriguing, high interest diamond exploration property. There is persuasive evidence that diamondiferous kimberlite is present within the Property. Pangolin have been innovative and thorough in their exploration approaches and are encouraged to maintain their exploration effort.

## 18 RECOMMENDATIONS

Pangolin has discovered evidence of diamond bearing kimberlite within the Malatswae Property. Locating the kimberlite bodies has however proved difficult.

To tackle this challenging situation, the following approaches are recommended:

i As soil sampling has been successful in discovering evidence of kimberlite, it is recommend that this exploration method be pursued in the areas of principle interest, at present the MSC grid and the MTS grid. Sample spacing could be reduced to <50 m.

ii All sampling to date has used a bottom screen cut-off of 0.425 mm (35#). This almost precludes the collection of spinels. Reducing the bottom screen to 0.300 mm, or even 0.25 mm, would result in higher grain counts plus the chance of recovering spinels.

iii Larger sample volumes may assist in counteracting the low abundance of kimberlite indicator minerals.

iv A program of regular repeat sampling of a set of sites, by the same methods and with the same sample parameters, is recommended in order to understand the level of reproducibility of results. Difficulties in the repeatability of Kalahari soil sampling data are well known, and a quantification of this would be valuable for diamond exploration in the Kalahari environment in general, and not only for the Malatswae Property.

v Prospecting Licences 083/2015 and 086/2015 should be covered by 1 km x 1 km reconnaissance sampling in the same manner as PL 247/2014.

vi With regards to sample treatment, it is recommended that regular audits be done on the discarded (light) fractions of a set of samples. The light fractions of, say 5%, of samples should be sent to an independent laboratory for bromoform separation followed by examination for kimberlite indicator minerals.

vii Pangolin has a very large database of both its own sampling data and historical data. However going forward better data management is recommended, in order that maximum leverage is gained from the database.

viii The Property geology makes geophysical interpretation difficult. Nevertheless consideration should be given to electrical methods, especially electro-magnetics, in addition to the potential field methods employed so far.

It is believed that a combination of the above may give Pangolin the key to discover the source of the kimberlitic grains found in the soils.

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## 20 DATE AND SIGNATURE PAGE

The undersigned, Ian McGeorge, contributed to all sections of this Technical Report, titled NATIONAL INSTRUMENT 43-101 TECHNICAL REPORT ON THE MALATSWAE DIAMOND EXPLORATION PROPERTY, BOTSWANA for PANGOLIN DIAMONDS CORP. with an effective date of 20 October 2016, in support of the public disclosure of technical aspects of Pangolinôs Malatswae diamond property in Botswana. The format and content of the report are intended to conform to Form 43-101F1 of National Instrument 43-101 of the Canadian Securities Administrators.

Signed,

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Ian McGeorge 20th October 2016

THE GEOLOGICAL SOCIETY
CGeol
CHARTERED GEOLOGIST
Fellow No. 1003981

## 21 QUALIFIED PERSON'S CERTIFICATE

I, Ian McGeorge, do hereby certify that:

1. I am a consulting geologist with McG&M (Pty) Ltd, t/a iQuest, and have an office at Unit 5, Plot 5648, Nakedi Road, Broadhurst, Gaborone, Botswana.
2. I am responsible for writing all sections of the Technical Report titled NATIONAL INSTRUMENT 43-101 TECHNICAL REPORT ON THE MALATSWAE DIAMOND EXPLORATION PROPERTY, BOTSWANA for PANGOLIN DIAMONDS CORP. with an effective date of 20 October 2016.
3. I am a graduate of the University of Glasgow with a B.Sc. Honours degree in geology (1975) and of Rhodes University, Grahamstown, South Africa, with an M.Sc. degree in mineral exploration (1982).
4. I am validated as a Chartered Geologist by the Geological Society, London, Fellow Number 1003981.
5. I have worked as a geologist for 40 years since my graduation. My relevant experience for this Technical Report is:
   - Four years (1982-1986) as project geologist in Botswana for African Selection Trust Exploration, engaged in exploration for kimberlites and diamonds.
   - Five years (1987-1992) as project geologist for Molopo Australia NL exploring for kimberlite and diamonds in Botswana.
   - Eleven years (1995-2006) as a consultant for MPH Consulting Ltd, Toronto, engaged in diamond exploration and evaluation projects in Botswana, South Africa and Lesotho.
   - Four years (2006-2010) as country manager for The MSA Group, Johannesburg, engaged in diamond exploration projects in Botswana.
   - Having authored NI43-101 Technical Reports on diamond exploration projects in Botswana, Liberia, Sierra Leone and Guinea.
6. I have read the definition of ñqualified personò set out in National Instrument 43-101 (ñNI43-101ò) and certify that by reason of my education, affiliation with a professional association (as defined in NI43-101) and past relevant work experience, I fulfil the requirements to be a ñqualified personò for the purposes of NI43-101.
7. I visited the sites discussed between 01 and 05 August 2016.
8. I am independent of Pangolin Diamonds Corp. applying the tests set out in section 1.5 of National Instrument 43-101.
9. I have not previously prepared any Technical Report for Pangolin Diamonds Corp. on the Property which is the subject of this Report.
10. I have read National Instrument 43-101 and the Technical Report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1.

11. To the best of my knowledge, information and belief the Technical Report contains all scientific and technical information available as of the effective date of the Report which is required to be disclosed in order that the Technical Report should not be misleading.

Dated this 20th day of October 2016.

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Ian McGeorge MSc CGeol FGS

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CGeol
CHARTERED GEOLOGIST
Fellow No. 1003981

## 22 GLOSSARY OF TECHNICAL TERMS

A glossary of technical terms related to the exploration for, and evaluation of, diamond deposits.

| | |
|---|---|
| *aeolian* | an adjective to describe a sediment transported and deposited by wind |
| *aeromagnetic survey* | Surveys flown by helicopter or fixed wing aircraft to measure the magnetic susceptibility of rocks at or near the earthôs surface. Kimberlite may be detected by these surveys. |
| *alluvial* | Transported and deposited in a river system, e.g. diamonds eroded from kimberlites and deposited in river gravel. |
| *Archaean* | The oldest rocks of the Precambrian era, older than about 2 500 Ma. |
| *artisanal* | Adjective to describe mining by workers operating without substantial capital, technical skills or training. |
| *basalt* | A common volcanic rock, dark and fine grained, relatively low in silica. May form very extensive lava flows. |
| *basement* | The igneous and metamorphic crust of the earth, underlying sedimentary deposits. |
| *bedrock* | the first hard and solid rock underlying soil or unconsolidated overburden |
| *breccia* | A coarse grained rock made up of large angular fragments, sometimes of various rock types. In kimberlite geology, often the filling of a kimberlite pipe made up of country rock fragments enveloped in kimberlite. The fragments may be transported within the pipe (an intrusive breccia) or essentially in-situ (an intrusion breccia).. |
| *brecciated* | Adjective applied to an intensely fractured body of rock. |
| *bulk sample* | a large sample, at least a hundred tonnes, usually excavated mechanically |
| *carat* | Standard unit of diamond weight, 1 carat = 0.2 grams |
| *carbonate* | A rock, usually of sedimentary origin, composed primarily of calcium, magnesium or iron and $CO_3$. Essential component of limestones and marbles. |
| *Carboniferous (Period)* | Geological Period 359-2 ï 299 Ma before present. |
| *caustic fusion* | A laboratory method of recovering microdiamonds (and other resistant minerals) from kimberlite by means of fusing the rock with sodium hydroxide, which destroys the silicate phases and leaves a small residue of resistate, in which will be found any |

| | |
|---|---|
| | diamonds present. |
| *CIM* | Canadian Institute of Mining, Metallurgy and Petroleum |
| *core drilling* | Method of obtaining cylindrical core of rock by drilling with a diamond set or diamond impregnated bit. For drilling of diamond deposits bits with synthetic rather than natural diamonds are used, to avoid possible contamination. |
| *chrome diopside* | A calcium, magnesium silicate, $Ca(Mg,Fe,Cr)(Si,Al)_2O_6$, with a high proportion of chromium substitution in the lattice, which is a common indicator mineral for diamond. |
| *chromite* | An oxide of chromium, $(Mg,Fe)Cr_2O_4$, some varieties of which can occur in kimberlite. |
| *colluvium* | sediment transported downslope by gravity; usually proximal to its source |
| *conglomerate* | A rock type composed predominantly of rounded pebbles, cobbles or boulders deposited by the action of water. |
| *craton* | Large, and usually ancient, stable mass of the earthôs crust comprised of various crustal blocks amalgamated by tectonic processes. A cratonic nucleus is an older, core region embedded within a larger craton. |
| *Cretaceous* | Applied to the third and final period of the Mesozoic era, 145 Ma to 65.5 Ma ago. |
| *CSAMT* | Controlled source audio-magnetotellurics. A geophysical survey method involving the induction of electrical currents in the earth. |
| *ct/100 t* | Carats per hundred tonnes. A common way of expressing the grade of diamonds in a deposit. |
| *ct/m$^3$* | carats per cubic meter. A common way of expressing the grade of diamonds in a deposit, sometimes favoured because it does not require an estimation of rock density. |
| *diamond drilling* | synonymous with *core drilling* |
| *diatreme* | A volcanic vent created by gaseous magma sourced from the mantle. A common mode of occurrence of kimberlite and often referred to as pipes, because of their near vertical attitude and frequently approximately circular or oval shapes. |
| *DMS* | Dense media separation. A technique to produce a diamond bearing concentrate. |
| *dyke* | A vertical or near vertical sheet of igneous rock, the widths of which may range from centimeters to hundreds of meters. One of the typical modes of occurrence of kimberlite, in the case of which widths are usually narrow, less than 2 m. |

| | |
|---|---|
| *EIA* | Environmental Impact Assessment. |
| *eluvium* | sediment derived from the physical and/or chemical decomposition of the underlying bedrock. |
| *EMP* | Environmental Management Plan. |
| *facies* | The sum of the lithological (and palaeontological) characters of a particular rock. In the case of kimberlite there are usually four facies recognized ï hypabyssal, diatreme, crater and transitional |
| *fault* | A fracture or fracture zone, along which displacement of opposing sides has occurred. |
| *G9* | A type of pyrope garnet often found in both diamond bearing and non diamond bearing kimberlite. Red to purple in colour. |
| *G10* | A type of pyrope garnet often associated with diamond bearing kimberlite. Lilac in colour. |
| *Ga* | Giga years (1 Ga = 1,000 million years) |
| *garnet* | A silicate mineral with many varieties. Specific compositions can be related to depths and pressures of formation, eg pyrope garnets are chrome rich and are common in kimberlite, and are a kimberlite indicator mineral. |
| *geophysical surveys* | instrumental surveys measuring small variations in the earthôs magnetic field, gravity field or electrical conductivity (in addition to some other properties) related to local variations in rock type. Widely used to discover kimberlite pipes. Magnetic and some electrical methods can be carried out from an aircraft. |
| *gneiss* | A coarse grained, banded, high grade metamorphic rock. |
| *GPR* | Ground Penetrating Radar. A geophysical technique which uses radar pulses to image the sub-surface. |
| *GPS* | Global Positioning System. A worldwide satellite based navigation system created by the United States Department of Defence. Able to give real time positions to approx ±5 m in X and Y using simple hand held instruments. |
| *gravity survey* | A geophysical survey technique which detects variations in the earthôs gravity field due to variations in the specific gravity of the underlying rock. Can used to detect kimberlite, which may have higher or lower specific gravity than surrounding rocks. |
| *grease table* | A device for recovering diamonds in a treatment plant using grease, to which the diamonds preferentially adhere due to their hydrophobic properties. |
| *ha* | Hectare = 10,000 $m^2$. A common unit for expressing the surface area of a kimberlite pipe. |

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| *hypabyssal* | An adjective for an igneous rock, *e.g.* kimberlite, which has crystallized from a melt within the earthôs crust, but at relatively shallow depth. |
| *ilmenite* | An iron, magnesium and titanium oxide ($(Fe,Mg)TiO_3$). The magnesium-rich ilmenite in kimberlite is called picro-ilmenite. |
| *Indicated Resource*<br><br>*(Indicated Mineral Resource)* | An Indicated Mineral Resource is that part of a mineral resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed. (CIM definition). |
| *indicator minerals* | A suite of resistant minerals with an origin and mode of occurrence similar to diamond, that can be indicative of the presence of primary diamond deposits. |
| *Inferred Resource*<br><br>*(Inferred Mineral Resource)* | An Inferred Mineral Resource is that part of a mineral resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. (CIM definition). |
| *isotope dating* | A method of dating rocks by quantifying the relative ratio of isotopes. |
| *joints* | Regular planar fractures or fracture sets in massive rocks, usually created by unloading, along which no relative displacement has occurred. |
| *Jurassic* | Second period of the Mesozoic Era, 200 to 145.5 Ma ago |
| *Kalahari* | An extensive tract of flat, featureless sand savanna, mainly devoid of perennial surface water, which takes up all of central and western Botswana, in addition to areas of South Africa, Namibia, Angola, Zimbabwe and Zambia. |
| *kelyphite* | An alteration rim on the surface of (pyrope) garnets in kimberlite resulting from reaction with kimberlite magma at depth or phase transformation reactions in peridotite-derived pyrope garnets. |
| *kimberlite* | An alkaline ultramafic igneous rock that is generated at great depths in the earth and emplaced at the surface in pipes |

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| | (diatremes), dykes or sills. The principal source of primary diamonds. |
| *KIM* | Kimberlite Indicator Mineral: pyrope garnet, eclogitic garnet, picro-ilmenite, chromite and chrome diopside. These are distinctive resistive minerals which occur in kimberlite in much higher concentrations than diamond, and which can be found in streams and soils and traced back to their kimberlite source, thus acting as pathfinders for diamond. The chemical compositions of garnet, ilmenite and chromite are related to the diamond potential of their source kimberlites, thus their mineral chemistry can provide an initial, non quantitative, grade prognosis. |
| *kriging* | A mathematical technique which uses spatial statistics to calculate estimations of mineral resources. |
| *LDD* | Large diameter drilling. Drilling of non-cored holes of diameter >15" |
| *lamproite* | A peralkaline volcanic or subvolcanic rock of mafic to ultramafic composition. Rarely, lamproite contains diamonds in economic quantities. |
| *limestone* | A sedimentary rock containing at least 50% calcium or calcium-magnesium carbonates. |
| *lineament* | A significant linear feature of the earthôs crust. |
| *lithosphere* | Mass of the mantle attached to the base of the crust that has a geological history related to that of the overlying crust, and that is cold and rigid relative to the deeper parts of the mantle. |
| *loam sampling* | Sampling the soil profile to recover resistant minerals. In the case of diamond exploration, loam sampling is intended to recover kimberlite indicator minerals. |
| *Ma* | Million years. |
| *mafic* | Descriptive of rocks composed dominantly of magnesium and iron rock-forming silicates. |
| *magmatic* | rock formed from crystallization of molten magma; an igneous rock. A descriptive of some kimberlite types which have crystallized without exploding. (Compare *volcaniclastic* kimberlite). |
| *magnetic survey* | A geophysical survey which measures variations in the earthôs magnetic field caused by differences in the magnetic susceptibilities of underlying rock. Kimberlite may be detected by this method, as its susceptibility may be higher or lower than surrounding rock types. |

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| *mantle* | The layer of the earth between the crust and the core. The upper mantle, which lies between depths of 50 and 650km beneath continents, is the principal region where diamonds are created and stored in the earth. |
| *Measured Resource*<br><br>*(Measured Mineral Resource)* | A Measured Mineral Resource is that part of a mineral resource for which quantity, grade or quality, densities, shape and physical characteristics are so well established that they can be estimated with confidence sufficient to allow appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity. (CIM definition). |
| *metamorphism* | Alteration of rock and changes in mineral composition, most generally due to increase in pressure and/or temperature. |
| *macrodiamond* | Definitions vary, but a diamond which would be recovered in a full scale mine plant. Now generally taken as >0.85 mm in size. |
| *microdiamond* | A diamond <0.85 mm in size, although definitions vary. Usually considered to be of no commercial value and too small to be recovered in a full scale mining operation. |
| *MiDA* | Abbreviation for ñmicrodiamond analysisò |
| *mobile belt* | An elongate belt in the earthôs crust, usually occurring at the collision zone between two crustal blocks, within which major deformation, igneous activity and metamorphism has occurred. |
| *orogeny* | A deformation and/or magmatic event in the earthôs crust, usually caused by collision between tectonic plates. |
| *Palaeozoic* | An era of geologic time between the Late Precambrian and the Mesozoic era, 545 Ma to 251 Ma ago. |
| *Permian (Period)* | Last Period of the Palaeozoic, 299 ï 252.2 Ma. |
| *petrography* | The description and classification of rocks. |
| *Percussion drilling* | Drilling by means of an air hammer which breaks the rock into chips which are brought to surface by air circulation. |
| *Precambrian* | Pertaining to all rocks formed before Cambrian time (older than 545 Ma). |
| *Probable Reserve*<br><br>*(Probable Mineral Reserve)* | A Probable Mineral Reserve is the economically mineable part of an Indicated, and in some circumstances a Measured Mineral Resource, demonstrated by at least a Preliminary Feasibility |

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| | Study. This study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. (CIM Definition) |
| *Proven Reserve*<br><br>*(Proven Mineral Reserve)* | A Proven Mineral Reserve is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified. (CIM Definition). |
| *Proterozoic* | An era of geological time spanning the period from 2 500 Ma to 545 Ma before present. |
| *pipe* | When referring to kimberlite, a synonym of *diatreme*. |
| *PL* | Prospecting Licence |
| *pyrope garnet* | A ruby-coloured garnet, $Mg_3Al_2(SiO_4)_3$, common in deep-seated ultramafic intrusive rocks and common as a xenocryst in kimberlite. |
| *RC drilling* | Reverse circulation drilling. A percussion drilling technique in which the sample is brought to surface by air and/or water through the centre of the drill pipe. Used when accurate sampling is required as the method minimizes cross contamination of samples. |
| *schist* | A crystalline metamorphic rock having a foliated or parallel structure due to the recrystallisation of constituent minerals. |
| *SAMREC* | The South African code for the reporting of exploration results committee |
| *spinel* | A group of oxide minerals of various compositions, $(Mg,Fe,Mn)(Al,Fe,Cr)_2O_4$, commonly occurring as an accessory in basic igneous rocks. |
| *stream sediment sampling* | The collection of samples of stream sediment with, in diamond exploration, the intention of looking for kimberlite indicator minerals or diamonds. |
| *strike* | Horizontal direction or trend of a geological structure. |
| *Tertiary (System)* | The rocks formed between the end of the Cretaceous at 65 Ma and the start of the Quarternary at 1.7 Ma. |
| *tonne* | A metric tonne, 1,000 kg |
| *tectonic* | Pertaining to the forces involved in, or the resulting structures of, movement in the earthôs crust. |
| *tph* | Tonnes per hour |

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| *Triassic (Period)* | First Period of the Mesozoic Era, 252.2 ï 201.3 Ma |
| *volcaniclastic* | rock formed by exploding magma in a volcano. Volcaniclastic kimberlite is common in kimberlite pipes. |
| *ultramafic* | Igneous rocks consisting essentially of ferromagnesian minerals with trace quartz and feldspar. |
| *variogram* | In spatial statistics, a graph which relates the variance of the difference in value between pairs of samples to the distance between them. Allows the weighting of a sample value in terms of its distance from the point where an estimate of sample value is required. |
| *WGS84* | World Geodetic System 1984. The reference system used by the GPS to calculate the co-ordinates of a position. |
| *xenocryst* | Applies to mineral crystals in igneous rocks that are foreign to the body of rock in which they occur. Very common in kimberlite, with diamond being an example. |
| *xenolith* | A piece of another pre-existing rock within an igneous intrusion. Very common in kimberites. |