

## Chaketma Phosphate Project Initial Gassaa Kebira Resource Triples Project Inventory

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### Board of Directors

Andrew Thomson, Non-Exec Chairman

David Regan, Managing Director

Russell Luxford, Executive Director

Martin Broome, Non-Exec Director

Gary Scanlan, Non-Exec Director

### Company Secretary

Melanie Leydin

### Listed Securities on Issue

CNL: 188,671,986 ordinary shares

CNLOA: 75,984,913 options expiring  
28 June 2013

CNLO: 25,358,026 options expiring  
31 March 2014

CNLCA: 14,887,796 partly paid shares

### Highlights

- An initial Inferred JORC Resource of 93 million tonnes (Mt) at 20.3% P<sub>2</sub>O<sub>5</sub> has been estimated for Gassaa Kebira, the second of six prospects at the Chaketma Phosphate Project, Tunisia
- Global Inferred Resource inventory now 130Mt @20.5% P<sub>2</sub>O<sub>5</sub>
- Confirms potential for Long Life project: 35+years

Celamin Holdings NL (ASX: CNL, "Celamin" or the "Company") and Tunisian Mining Services SARL ("TMS"), its Tunisian Joint Venture partner, are pleased to announce a JORC-compliant Mineral Resource at the Gassaa Kebira prospect of the Chaketma project in Tunisia and a substantial increase to the global project inventory.

Independent consultant Geos Mining has estimated an Inferred JORC-compliant Mineral Resource at Gassaa Kebira of 93 million tonnes of rock phosphate at a grade of 20.3% P<sub>2</sub>O<sub>5</sub>, prepared using a cut-off grade of 10% P<sub>2</sub>O<sub>5</sub>.

A summary of the current global phosphate resource inventory at the Chaketma Project is outlined in the table below;

Prospect	Resource Classification	Mt	% P <sub>2</sub> O <sub>5</sub>
Gassaa Kebira	Inferred	93	20.3
Kef El Louz North	Inferred	37	21.0
<b>Total</b>		<b>130Mt</b>	<b>20.5</b>

Celamin Chairman, Hon. Andrew Thomson said, "This is a landmark achievement for the Company. The Inferred JORC Resource at Gassaa Kebira combined with the previously established resource at Kef El Louz North, both within the Chaketma Project area, firmly establishes the basis for initial production in Kef El Louz North and targets and sets the platform for additional resource upgrades and expansion.

"The establishment of a defined JORC resource for the Chaketma Project of this size and grade has exceeded our expectations and highlights the relatively conservative assumptions which were outlined in the Scoping Study."

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Celamin Managing Director, David Regan said, "The delineation of our JORC Resource at Gassaa Kebira allows us to further progress with the implementation and development of the Chaketma Project."

"Work to progress the Definitive Feasibility Study (DFS) continues. An experienced Project Director has been appointed, and further members of the project management team are currently being recruited. Requests for bids for the DFS Engineer have been issued to 4 shortlisted international engineers, and an award is expected in Q3 2013. Further metallurgical optimization studies are ongoing, and pilot plant scale validation of the optimized flowsheet is planned for Q4 2013. Planning for social, environmental and water studies is advanced, and these will be awarded in conjunction with the DFS Engineer."

"Ongoing exploration and resource step out drilling will continue. This activity is targeted at enlarging and improving the classification of the resource at Kef El Louz North and delineating additional resources in the other prospect areas. Our confidence in ultimately achieving our exploration target of 175 - 280 MT of economic resources at Chaketma has been improved significantly by our recent successes."

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# 1 Resource Estimation Procedures

## 1.1 Introduction

Gassaa Kebira is the northernmost of the six prospects within the 56km<sup>2</sup> Chaketma exploration permit (Figure 3). It has an elongate shape and spans approximately 2.6km north-south and 0.9km east-west, with a surface area of 2.36km<sup>2</sup>.

Topographically, it appears a prominent mesa when viewed from the east; however, from the west gentle folding can clearly be discerned. A large scarp is visible at the northern end, while the southern portion of the deposit has a hummocky appearance.

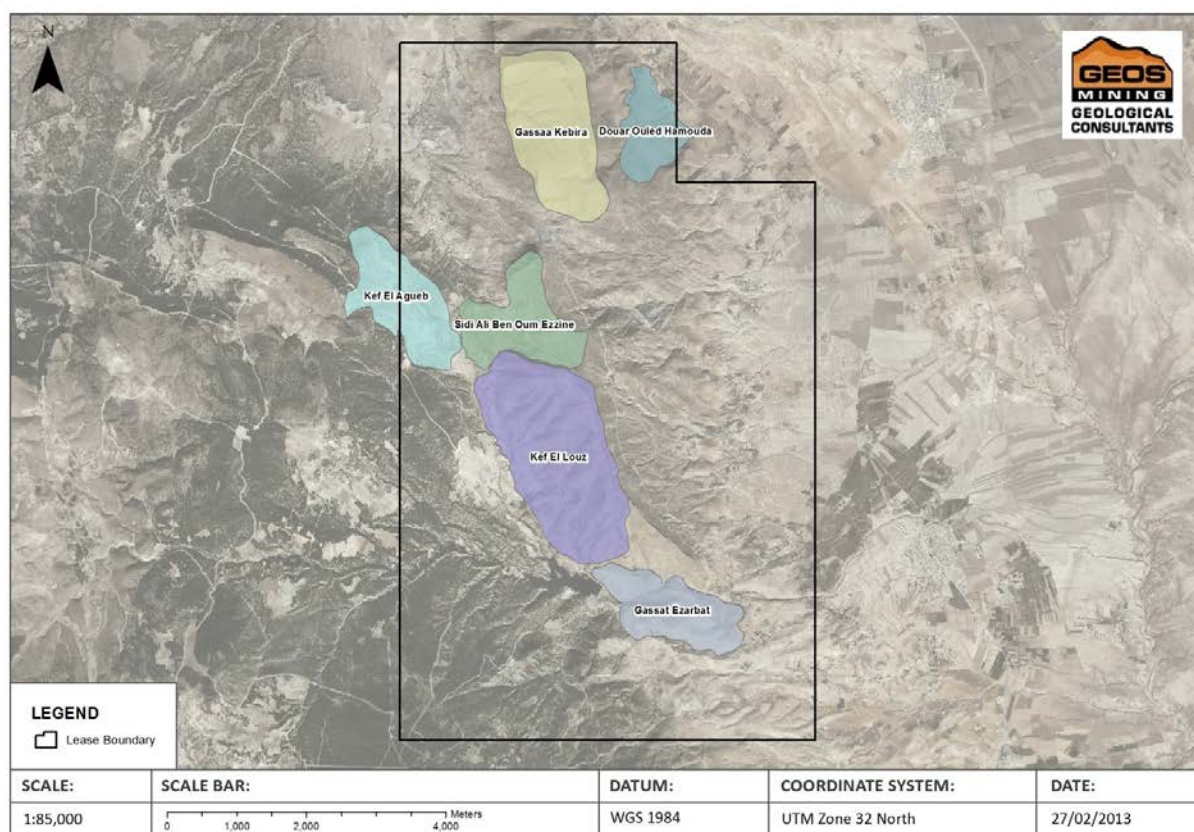


Figure 1: Location of Gassaa Kebira prospect within the Chaketma exploration permit.

## 1.2 Geology

The Chaketma project is characterised by an exclusively marine sedimentary sequence of shallow shelf carbonates, sandstones and deeper marine clays and marls, dating Cretaceous to Miocene.

Within the Gassaa Kebira resource area, the dominant stratigraphic sequence (from top to bottom) comprises a massive dolomitic limestone of Lutetian age, followed by the Ypresian phosphate suite and then a gradational transition to Paleocene marls.

The top of the phosphate suite is a phosphatic dolomite /dolomitic phospharenite, quickly grading down to a high grade medium-grained phospharenite. This massively-bedded arenaceous unit occupies a substantial portion of the total mineralised sequence and is continuous over the entire deposit. Grain

size decreases and marly intercalations gradually increase towards the bottom of the sequence, before passing into thicker marls below (Figure 2).

### 1.3 Structure

Gassaa Kebira is situated within an extensional “pull-apart basin” which contains evidence of rotational-block and strike-slip faulting, slumping and gentle folding (Figure 2).

The northern end of the prospect has been subjected to dramatic EW-trending normal faulting with significant vertical displacement and associated drag folding. Gassaa Kebira has been upthrown relative to neighbouring Gassaa Sghira which is located further to the north and outside the exploration permit.

A gentle synclinal fold occupies the central third of the deposit. The northern limb of the mineralized horizon dips approximately 15° SSW towards the fold axis, while the southern limb dips 12° NNW into the axis of an anticline located further south. Along both fold hinges evidence of faulting exists, although data is currently lacking to fully define relative motions.

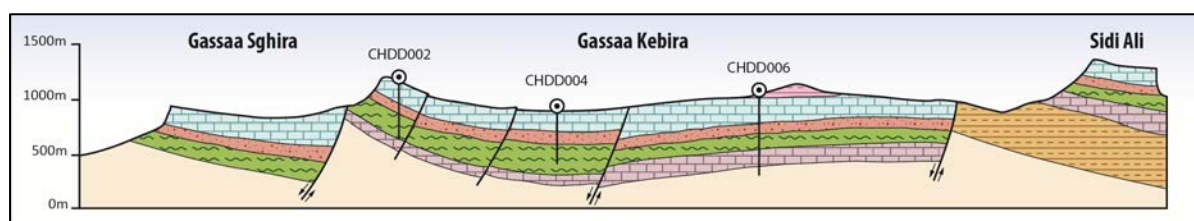


Figure 2: Schematic cross-sectional view of Gassaa Kebira looking east.

The southern portion of the deposit is characterised by hummocky terrain which may be indicative of local block faulting, although the mineralised horizon remains consistent over the available points of observation.

A major NNW-SSE-trending bounding fault is believed to run the entire length of the western side of the deposit, in the manner as at Kef El Louz to the south. The existence of this fault is confirmed stratigraphically with the juxtaposition of Eocene strata against older Cretaceous marls to the west, although the location has been inferred by changes in topographic profile.

The eastern side of the deposit is also fault-bounded along its entire length, although the boundary consists of NNW-SSE oriented listric faults with large-scale block slumping and rotation. These staggered blocks eventually merge with the Dour Ouled Hamouda prospect to the east.

### 1.4 Data

The Gassaa Kebira resource estimation employs data from 18 points of observation comprising 10 diamond drill holes and 8 trenches, summarised below in Table 1 and detailed in Appendix 2: Exploration Data. A complete set of assay results was available for all points of observation.

Table 1: Field data summary

Site Type	No. Sites	Meterage	Geology Records	Assayed Samples
Drill holes	10	1417.95m	59	326
Trenches	8	176.8m	141	156
<b>Total</b>	<b>18</b>		<b>200</b>	<b>482</b>

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Tunisian Mining Services (TMS) were responsible for the majority of site exploration activities including: drill service provision, trench excavation, geological logging and sample preparation & processing.

Field observations were compiled into purposed Excel spreadsheets of a consistent format, which were sent to Geos Mining upon completion and validation of the site data. Laboratory assay reports were always provided in their original format.

Upon receipt, data was uploaded to the project database using software based importers to minimise any data handling errors and perform routine validation. All project data was stored in a custom designed Microsoft SQL Server 2008 R2 database, hosted on Geos Mining servers, where it was subjected to additional validation and sample QA/QC.

## 2 Exploration Procedures

### 2.1 Drilling

Diamond drilling at Gassaa Kebira occurs at a nominal spacing of 400m, although site access issues result in irregular drill spacing over sections of the deposit (shown in Figure 3). All holes were fully cored at dominantly HQ diameter.

Drill locations were initially located by handheld GPS and followed up with a professionally-conducted differential GPS (DGPS) survey.

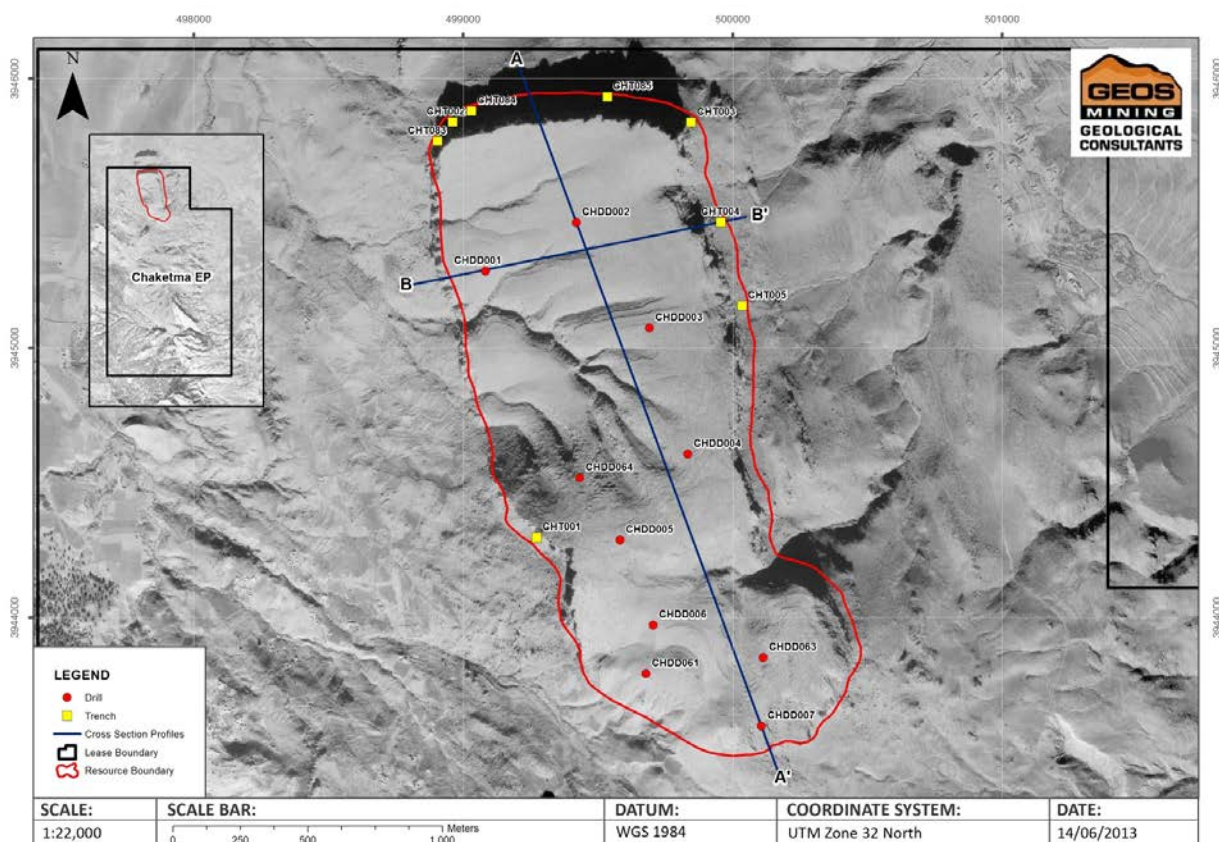


Figure 3: Gassaa Kebira resource area and points of observation employed in resource estimation.

None of the available drill holes have been surveyed down-hole and drilling orientation has been discerned from measurements directly during drilling setup. The database contains a mixture of vertical and angled holes between 70-75°. Core has not been oriented for recording of detailed structural measurement.

Drill core has been geologically logged and lithological, structural and geotechnical data recorded. To date, sample recovery has been high (98%) and the RQD values show the local strata to be competent and well-suited to current drilling practices.

Diamond core sampling procedures stipulate a maximum 1m sample length, with an allowance to reduce sample lengths to a minimum of 25cm, should the lithological sequence require it. As a result the majority of drill samples consist of 1m length, HQ diameter half-core splits.

SG testing has been performed on 70 diamond core samples in the resource area using the water displacement method. Samples were not waxed or wrapped to prevent water ingress. In situ moisture has not yet been measured.

## **2.2 Trenching**

Trenching is largely restricted to the north and eastern limits of the deposit (Figure 3), where the phosphate horizon outcrops at the base of the massive dolomite. Trench sites were excavated where outcrop was not readily exposed and samples cut directly from fresh rock using diamond-blade rock saws. Trench spacing is nominally 350m between points, although this is dictated by accessibility and the nature of the site.

Trench locations and orientations were initially located using handheld GPS and later professionally surveyed. The professional survey team captured greater detail by taking DGPS readings at major points of inflection over each profile, allowing full 3D definition of the trench floor.

Trench samples are processed under identical sampling protocols to drill samples and retain the dominant 1m sample length.

Due to the irregular dimensionality of the trench cutting samples compared to fixed diameter drill core, field SG testing of trench samples has not been undertaken.

## **2.3 Sampling**

Drill and trench samples are processed by TMS personnel under a common set of procedures. The primary field sample is jaw crushed to a 2mm pulp then riffle split to a 500g secondary sample which is submitted for laboratory analysis.

Sample QAQC procedures are being observed, with the additional of field blanks, duplicates and certified reference standards to each sample batch. Blanks have been regularly submitted from early in the program, although these were not processed in sequence with each sample run and consequently do not monitor site sample hygiene.

## **2.4 Laboratory Analysis**

Al Amri Laboratories performed the majority of analytical work, although duplicate samples were sent to ALS, Seville for QAQC reconciliation of the assay method. Major oxides, including the modelled

quantities ( $P_2O_5$ , MgO,  $SiO_2$  and CaO) were assayed using X-Ray fluorescence with borate fusion extraction, an appropriate technique for the style and chemistry of the mineralisation.

Al Amri is recognised as operating in an ISO 9001:2000 environment and employs various quality control procedures to ensure credibility in reported results. As part of these procedures, internal laboratory duplicates and standards are introduced into each batch and monitored for anomalies.

Laboratory certificates have been provided and a random subset of values reconciled against the assay database to ensure validity of the exploration database.

### 3 Resource Estimation

#### 3.1 Working Section Domains

The primary  $P_2O_5$  working section in each drill hole/trench was defined by consecutive samples exceeding a 10% $P_2O_5$  bottom cut. Within the working section, three mineralisation domains have been interpreted from the geological and assay data which are believed to represent fundamental changes in the paleodepositional environment.

After statistical appraisal of the vertical grade profile, a nominal 4% MgO grade boundary was chosen to delineate between zones. This results in upper and lower zones above the MgO threshold (Figure 4: A & C), with a low MgO, high  $P_2O_5$  layer in between (Figure 4: B)). Custom scripting was used to partition assayed samples into each of the 3 domains and supply intervals for development of the working section.

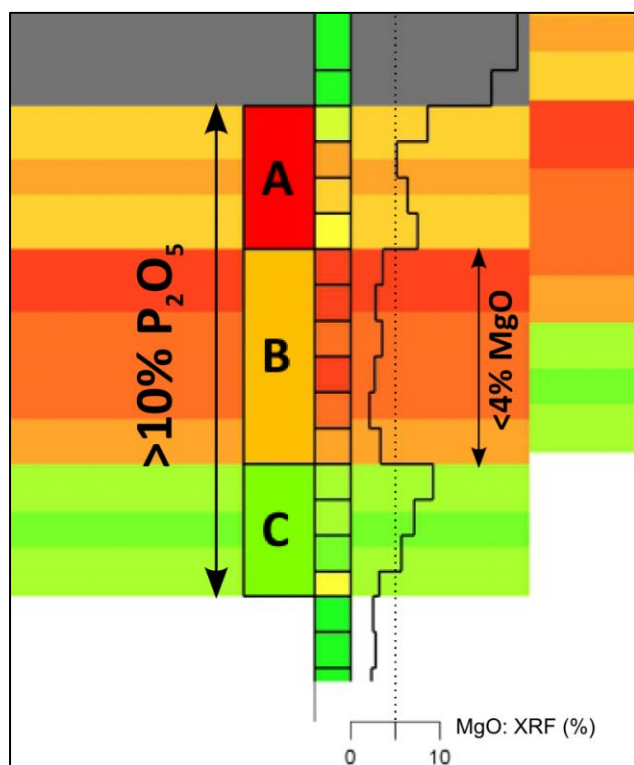


Figure 4: Cross-sectional view of  $P_2O_5$  block model showing domain subdivision criteria & reconciliation of block grades against composites.

### 3.2 Model Methodology

Grade modelling was undertaken in Micromine 2013 software, using the new Stratigraphic Modelling module and workflow. This approach allows the geometry of the tabular phosphate horizons to be modelled without assuming a linear relationship between points of observation, producing a realistic approximation of the folded mineralisation. It also facilitates use of a larger block sizes which are necessary given the current data point spacing.

Dummy geometry parameters were manually derived from local trends and used to constrain mineralisation around the periphery of the deposit, negating unintended edge effects. The elevation (RL) of each domain was appraised geostatistically to ascertain key interpolation parameters. Regular geometry grids were produced for the roof and floor RL of each domain using Ordinary Kriging and converted to 3D block models with a block dimension of 40mX x 40mY x 1mZ. Figure 5 shows the cumulative thickness of the 3 domain working section over the resource area.

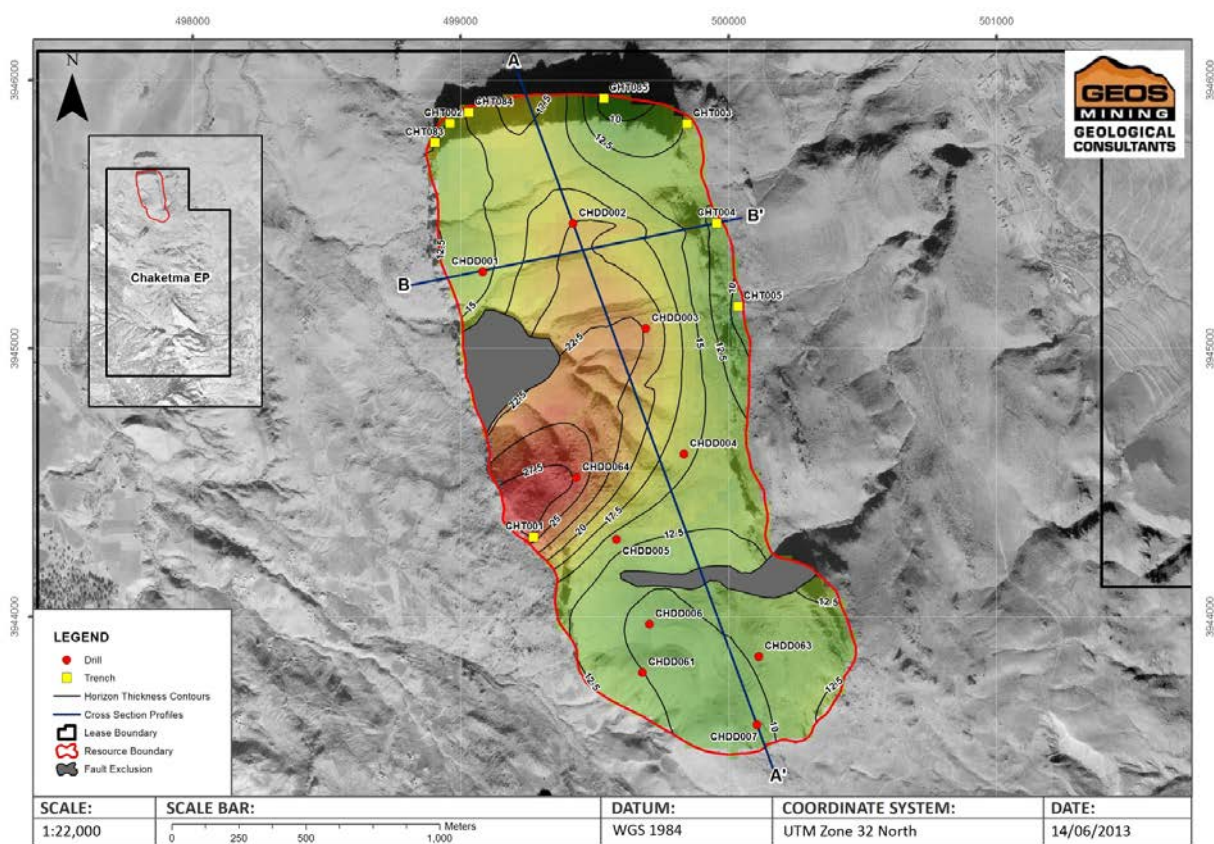


Figure 5: Contoured cumulative working section thickness (A,B & C domains).

Samples were composited to 1m lengths, based on the prevalence of this sample length in the source data and to preserve vertical variations in grade in the resource model. Geostatistical analysis including omnidirectional and down-hole variography of the composited samples yielded search neighbourhood and kriging parameters for grade interpolation of  $P_2O_5$ ,  $MgO$ ,  $SiO_2$  and  $CaO$ . These analyses revealed an approximate range of mineralisation of 800m in each domain. Search ellipse parameters were derived individually for each modelled quantity and substituted into the process as required.

A flattening algorithm was employed to improve the quality of grade interpolation of the folded mineralised domains. This technique normalises each domain's blocks and composites to a level plane, permitting the use of a thin data search to preserve the vertical grade profile between points of



observation (Figure 4). The search was also limited in the quantity of data points accessible from each location (hole/trench) to combat vertical over-smoothing.

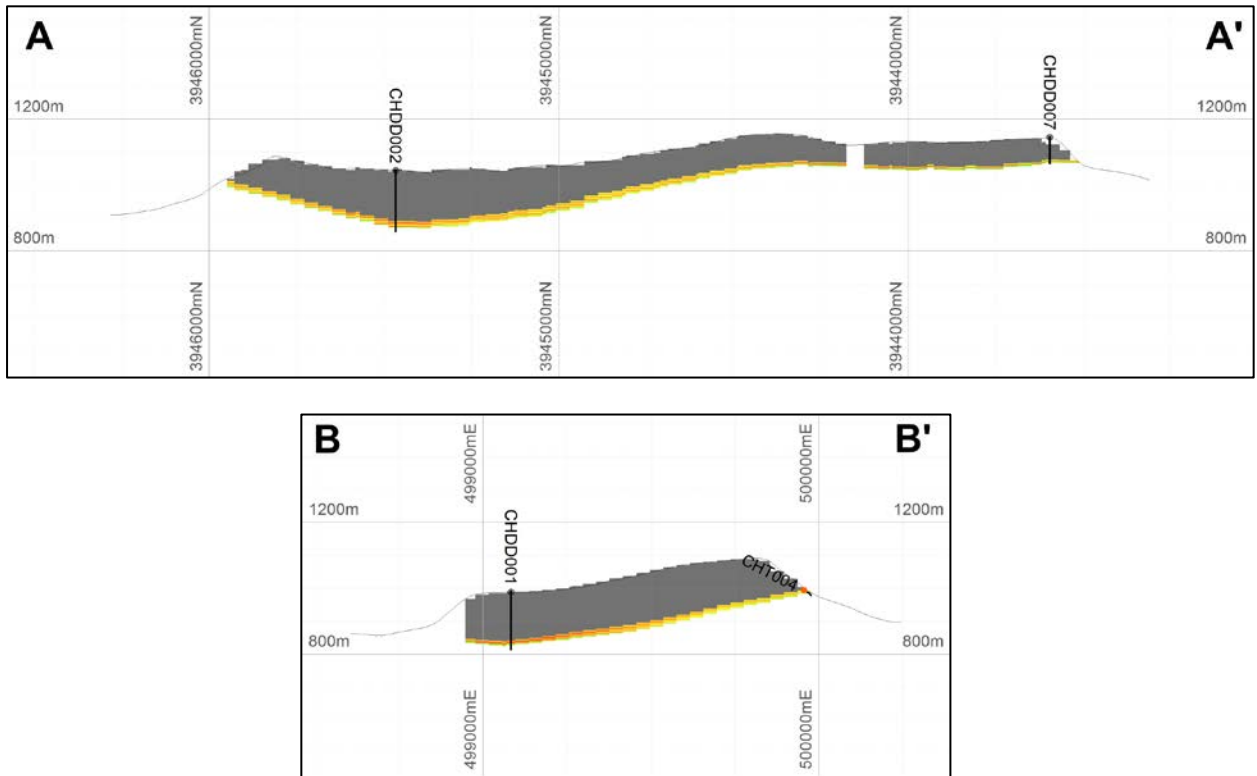


Figure 6: NS & WE cross-section of resource model (overburden: grey; mineralised horizon: coloured). Section profile marked on maps.

Three-dimensional Ordinary Kriging was used to interpolate the grade of each domain in the flattened state. The resultant grade models were reviewed on a cross sectional basis (Figure 6) against the raw assays and the grade tonnage curves inspected (see Figure 7).

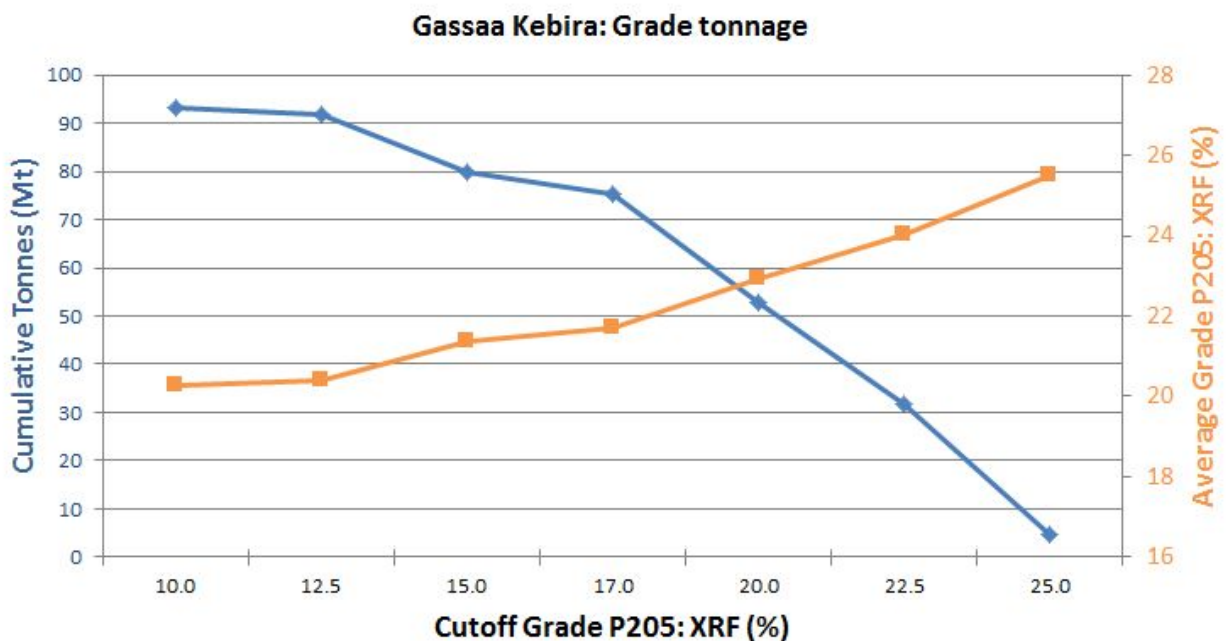


Figure 7: Global grade-tonnage curves (all horizons)

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The grade model was constrained by a bounding wireframe incorporating the 5m elevation digital terrain model, interpreted boundary faults, outcrop lines, surface mapping, survey locations and the average range of mineralisation. Sub-blocking down to 10mX x 10mY x 1mZ (4 x 4 x 0 sub-blocks) was used to ensure the block volume conformed to the resource boundary.

Two zones of uncertainty were excised from the model due to lack of proximal data and local structural uncertainty. Both follow deep drainages believed to represent the surface expression of E-W trending major faults running through the resource interior. Material within these zones has been excluded from the reported grade-tonnage.

Insufficient SG data was available to provide an interpolated value for each block, so average values were calculated for each domain. The tonnage has been estimated on a dry basis.

## 4 Potential for Economic Development

### 4.1 Potential Mining Methods

The Gassaa Kebira resource outcrops, but overburden thickness increases rapidly towards the resource interior due to tendency of the massive dolomite to form cliffs. Typically thickening overburden is accompanied by a corresponding increase in the thickness of underlying mineralisation. The dolomite overburden reaches a maximum thickness of 157m in the north of the deposit; however, it is notably thinner over much of the resource area (Figure 8).

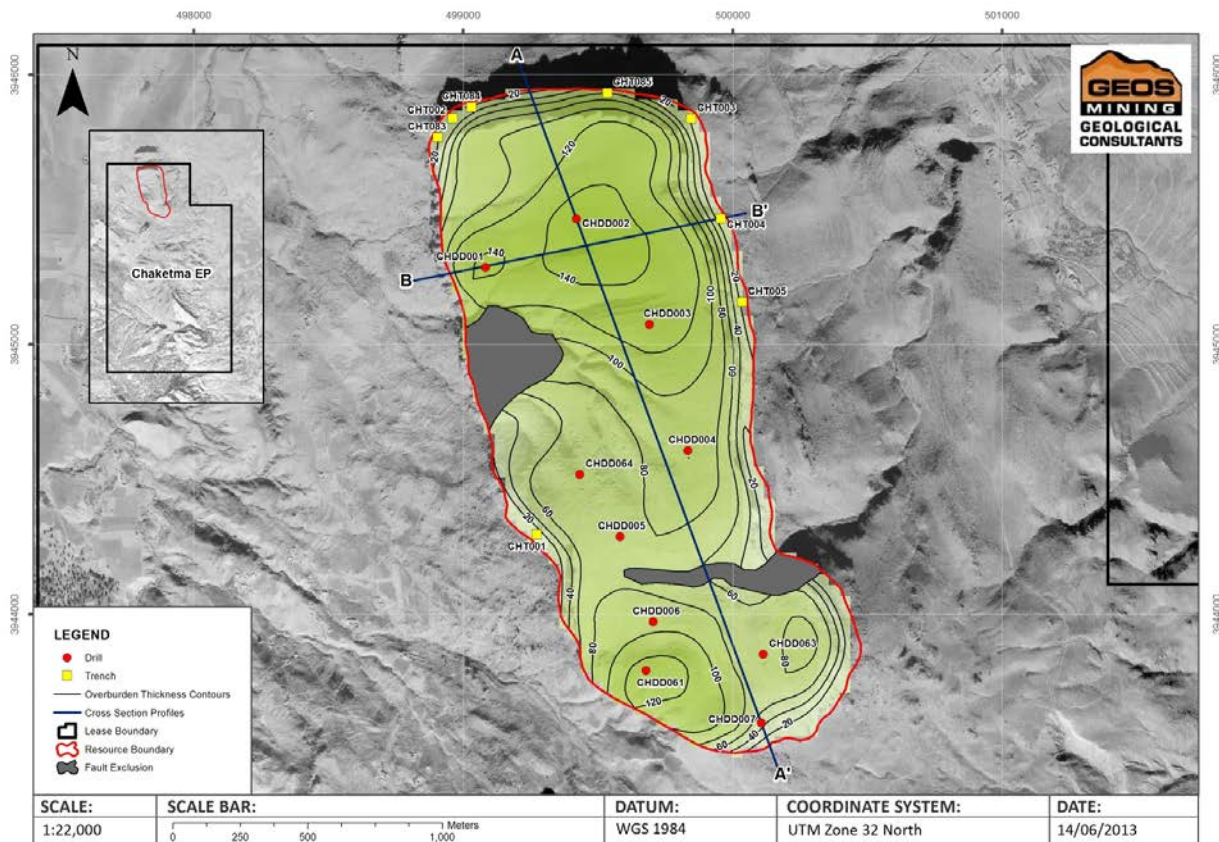


Figure 8: Overburden thickness contours

Strip ratios were calculated relative to the cumulative thickness of the A, B and C horizons and average 6.1 over the entire resource area (Figure 9). Approximately 30% of the deposit exists under a strip ratio of 5:1 and at least 90% is under 10:1.

The majority of the deposit appears suitable for conventional open-cut mining, although shallow underground workings may be an option in the deepest areas.

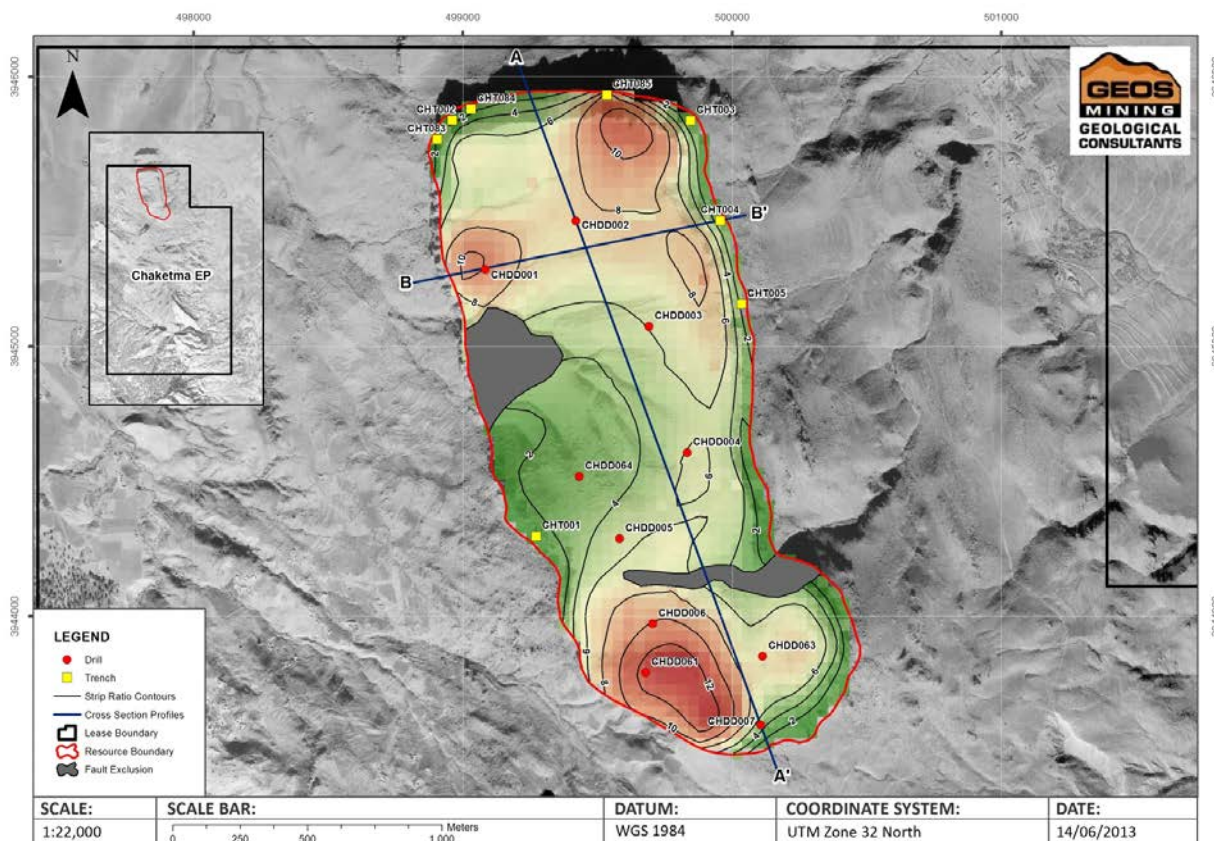


Figure 9: Strip ratio contours for cumulative working section thickness.

## 4.2 Potential Development

The previously announced scoping study (14 August 2012) identified reverse flotation to convert Chaketma phosphate rock to a saleable commercial concentrate grading 30% P<sub>2</sub>O<sub>5</sub>. The scoping study identified no fatal flaws to extraction, processing or ore transportation and indicated positive economics under reasonably assumed parameters.

## 5 Resource Classification

The resource totals 93Mt at 20.3% P<sub>2</sub>O<sub>5</sub>. This is currently classified as an Inferred Mineral Resource under the JORC 2012 guidelines. We anticipate that limited additional work is required to upgrade the majority of this resource to indicated status. This additional work includes better delineation of geometry of mineralisation using geophysical surveys and/or additional drill data, more data to define the local structures over the resource area and their effects on mineralisation, additional analytical results including a larger dataset of analyses with complete quality control records, and information on in situ moisture contents.

## 6 Statements

### 6.1 About Celamin Holdings NL

Celamin Holdings NL (ASX Code CNL) is an ASX listed company focused on the exploration and development of resource projects in North Africa initially in Tunisia.

Celamin and local partner Tunisian Mining Services SARL continue to advance the Chaketma Phosphate Project in Tunisia.

Positive Scoping Study results were announced on 14 August 2012. A maiden JORC Inferred Resource was announced for the Kef El Louz prospect on 9 November 2012. The next phase of work includes the completion of a Bankable Feasibility Study.

### 6.2 Competent Persons Statement

Resource estimation and management of the project database were undertaken by Geos Mining's Senior Geologist: Resources & Data, Oliver Willetts.

The information in this report that relates to Exploration Results and Mineral Resources is based on information compiled by Oliver Willetts, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy (membership No. 312940).

Oliver Willetts has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Willetts consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

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# Appendix 1: JORC Compliance Table

## Section 1: Sampling Techniques & Data

<b>Sampling Techniques</b>	<ul style="list-style-type: none"><li>• 10 fully-cored diamond drill holes, plus 8 trenches &amp; associated cut samples.</li></ul>
<b>Drilling Techniques</b>	<ul style="list-style-type: none"><li>• HQ Diamond drilling under normal circulation with bentonite/water fluids.</li><li>• Excellent drill core recovery averaging 98%.</li><li>• Core not oriented.</li></ul>
<b>Logging</b>	<ul style="list-style-type: none"><li>• Drill core &amp; trench cuttings have been logged in sufficient detail to support Mineral Resource estimation.</li><li>• 1417.95m diamond core &amp; 176.8m trench profile logged.</li><li>• Lithology, structures, geotechnical data captured.</li><li>• Mixture of qualitative &amp; quantitative data, although key factors are quantitative.</li><li>• Core photography exists for mineralised &amp; sampled region at minimum.</li><li>• Most trench cutting sites are photographed.</li><li>• Drill holes logged in entirety, trench cuttings logged as far as observable.</li><li>• Consistent &amp; mature logging system.</li></ul>
<b>Sub-sampling techniques &amp; sample preparation</b>	<ul style="list-style-type: none"><li>• Diamond core sampled as ½ core, jaw crushed to 2mm, and then riffle split to a 500g split for laboratory submission.</li><li>• Trench samples are crushed in their entirety to 2mm, and then riffle split to a 500g split for laboratory submission.</li><li>• Sampling style and size is representative for the style of mineralisation. Jaw crushing &amp; riffle splitting ensures even coarsest material is evenly distributed.</li><li>• Appropriate QAQC measures taken to instil reasonable confidence in the sampling procedures.</li></ul>
<b>Quality of assay data &amp; laboratory tests</b>	<ul style="list-style-type: none"><li>• Inclusion of at least one field blank sample in the majority of core/trench sample sequences. Field blanks were not processed in sequence with samples and consequently do not reflect site sample preparation hygiene.</li><li>• Inclusion of at least one field standard using one of three certified reference materials in 4 drill holes and 3 trenches.</li><li>• Field blank &amp; reference standard sampling suggests acceptable precision &amp; accuracy of assay returns.</li><li>• Laboratory certificates provided.</li></ul>
<b>Verification of sampling &amp; assaying</b>	<ul style="list-style-type: none"><li>• Site visit by Geos Mining verified sampling procedures, local geology &amp; mineralisation style.</li><li>• Currently no twinned holes/trenches; however, vertical grade profile is demonstrably continuous between proximal points of observation, instilling confidence in reported &amp; logged intersections.</li><li>• Field logs are provided in a consistent format &amp; imported using a software importer to minimise human errors.</li><li>• Original laboratory files used to populate exploration database assay tables via an automatic software assay importer. Minimal human handling of assay data.</li><li>• Any errors flagged during data import were reconciled in consultation with site personnel.</li></ul>
<b>Location of data points</b>	<ul style="list-style-type: none"><li>• All sites surveyed by professional survey contractor (Big B) with DGPS (differential GPS) capabilities.</li><li>• Trenches surveyed at major inflection points to provide accurate floor profile.</li><li>• All coordinates in Universal Transverse Mercator: Zone 32 North format (WGS84 spheroid)</li><li>• DGPS provides RL values which corroborate with the 5m contours over most of the deposit (except northern end)</li><li>• Aerial image-derived contours are inaccurate at northern end of the deposit due to heavy relief shadowing. Surveyed trench positions &amp; surface geological mapping have been used in place of contours in this region.</li></ul>
<b>Data spacing &amp; distribution</b>	<ul style="list-style-type: none"><li>• Drill hole spacing averages 400m; Trench spacing is irregular, but averages 350m where outcrop is consistent.</li><li>• Current data point spacing provides sufficient geological &amp; grade continuity over the resource area for the chosen resource estimation procedures and establishment of an Inferred Mineral Resource.</li><li>• Dominant raw sample length of 1m in core and trenches.</li></ul>

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

- Drill holes & trenches are spaced regularly over most of the project area and are not judged to result in significant bias to sampling, or over-thickening of the mineralised horizon.
- Regions lacking sufficient data have been excluded from the resource estimate.
- Drill holes intersect mineralisation at a high angle to the bedding.

**Sample security & audits**

- Sample preparation performed on site by TMS personnel.
- Sampling procedures witnessed by competent person.

## Section 2: Reporting of Exploration Results

**Mineral tenement & land tenure status**

- Permit renewed in May 2013 for three year period expiring 10 February 2016.
- The company is in good standing & has the support of local government.

**Geology**

- See Geology chapter of report.

**Drill hole information**

- See Appendix 2: Exploration Data
- See Figure 3 for location of drill holes & trenches.

## Section 3: Estimation & Reporting of Mineral Resources

**Database integrity**

- Data stored in Microsoft SQL Server 2008 database
- Field logs provided in a consistent format & imported using a software importer to minimise human errors.
- Original laboratory files used to populate exploration database assay tables via an automatic software assay importer. Minimal human handling of assay data.
- Database assay values have been subjected to random reconciliation with laboratory certified values to ensure agreement.
- Any errors flagged during data import were reconciled in consultation with site personnel.
- Records validated down-hole visually.

**Site visits**

- September 2012 site visit conducted by competent person:
  - Trench & drill sites inspected & locations verified
  - Local geology witnessed at multiple locations
  - Sampling procedures witnessed
  - Drill core inspected
  - Discussions with field geologists about mineralisation structure, local & regional geology
  - Advice provided on improvements to logging & sampling procedures to increase confidence.
- Geological understanding increased & incorporated into the resource model.

**Geological interpretation**

- Current data spacing & quality is sufficient to imply, but not verify grade continuity.
- Faulting is known to occur throughout the resource area; however, the current data is insufficient to provide an understanding of relative motions or any associated effects on mineralisation.
- Local folding of mineralised horizon has been accommodated in the resource model.
- Outcrop limits mineralisation to the north and east and sections of the west and mineralisation appears fault-constrained on all sides. Where outcrop is unavailable, the position of the bounding fault has been inferred using topography and aerial imagery.
- Logged lithology used alongside assay results to establish & constrain mineralised working section.

**Dimensions**

- Inferred resource area: ~2.57km NNW-SSE x ~0.9km ENE-WSW
- Surface area: 2.36km<sup>2</sup>
- Average mineralisation thickness: 15.7m
- Maximum depth of cover: 157m

**Estimation & modelling techniques**

- Mineralisation divided into 3 domains on a down-hole/along-trench basis, according to P<sub>2</sub>O<sub>5</sub> grade (>=10%) & MgO content (4%). This approach was designed to delineate boundaries in gradational facies at the top & bottom of the sequence and separate the high-grade central portion of the profile.
- Dummy points used to constrain & project mineralised horizon geometry beyond exploration limits.
- Mineralisation domain roofs & floors gridded between points of observation. Variography used to model variance in horizon topography and provide parameters for Ordinary Kriging interpolation.
- Samples composited to 1m, in line with dominant sample length of 1m. Individual composite sets for each horizon to ensure no contamination.
- Block models created from roof and floor RL grid files at 40mN x 40mE x 1mRL with no sub-blocking. Block dimension chosen to preserve grade continuity within folded horizons.
- Block model & composites flattened to common plane by centre line to ensure grade continuity between holes & enable use of a thin search ellipse capable of preserving vertical stratified grade profile.
- Omnidirectional variography investigated to quantify grade continuity & provide Kriging & data search parameters.
- Range of mineralisation: ~700m – 1000m
- Grade interpolated for P<sub>2</sub>O<sub>5</sub> & MgO using 3D Ordinary Kriging.
- Search parameters (flattened state):
  - **A Horizon:** 700mX x 700mY x ~6mZ.
  - **B Horizon:** 750mX x 750mY x ~5mZ.
  - **C Horizon:** 1100mX x 1100mY x ~4.5mZ.
- Sectional appraisal of interpolation performance, validating block grades against raw assay/composite results.
- Block model sub-blocked post-grade interpolation to a minimum block dimension of 10mX x 10mY around peripheries only to ensure accurate block volumes around outcrop zones.
- Block model clipped to a resource boundary derived from:
  - Outcrop with hill side (corrected to trench bases in north of deposit to circumvent errors in contour data).
  - Inferred fault boundaries to south, west and east.
  - Data point spacing & clustering,
  - Local geological features capable of affecting mineralisation.
- Additional material excised from model interior around two zones of suspected faulting with insufficient proximal data support.

**Moisture**

- Tonnes are estimated on a dry basis, using SG data obtained under the water displacement method with unsealed core.
- SG parameters:
  - **A Horizon:** 3.18 (n=3)
  - **B Horizon:** 2.65 (n=15)
  - **C Horizon:** 2.69 (n=4)

**Cut-off parameters**

- Samples selected for modelling based on 10% P<sub>2</sub>O<sub>5</sub> bottom cut. The central phosphatic unit employs a 4% MgO cutoff to avoid incorporation of material around gradational roof & base contacts

**Mining factors**

- Open-cut potential exists over the deposit, although some of the deeper mineralisation may be more economically suited to shallow underground workings.
- The continuity and thickness of central B horizon of the working section could allow a selective mining approach.
- Average strip ratio: 6.1

**Metallurgical factors**

- Use of MgO cutoff designed to provide a saleable product comparable to that of currently producing phosphate mines.
- Gassaa Kebira phosphate rock is assumed to be compatible with a suitable beneficiation process capable of reducing MgO & increasing P<sub>2</sub>O<sub>5</sub> concentrations in the saleable concentrate to commercially acceptable levels.

**Environmental factors**

- Not considered an environmentally sensitive area.
- Local inhabitants occasionally protest the lack of available employment on the project, although efforts are being made to incorporate local labour wherever possible.

**Bulk Density**

- Bulk density determined for each modelled horizon.
- SG of drill core measured on a dry basis using the water displacement method on unsealed core.
- 70 samples total (22 samples within working section).

**Classification**

- An Inferred Mineral Resource of 93Mt of phosphate rock at a grade of 20.2% P<sub>2</sub>O<sub>5</sub> compliant with the Joint Ore Reserves Committee (JORC) 2012 guidelines.
- It is felt that the current data spacing is sufficient to imply grade & mineralisation continuity over the resource area; however, the presence of structural features capable of impacting local mineralisation thickness &/or grade is likely. These currently cannot be assessed with available data and must be addressed to further increase resource confidence.

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**Relative accuracy/confidence**

- The resource model represents the available data as closely as possible and cross-sectional validation shows that sample grades reconcile closely with modelled block grades.
- The block model should not be used for detailed mine planning as the data spacing and sample support is currently inadequate for accurate positioning of mineralisation and grade.



## Appendix 2: Exploration Data

### A Drill Hole Data

Site_id	Site_type	East	North	RL	Survey_method	Dip	Azimuth	Metres_total
CHDD001	Drill	499083.6	3945286.5	987.7	DGPS Survey	-90	-	175.8
CHDD002	Drill	499419.6	3945466.8	1043.6	DGPS Survey	-90	-	188.2
CHDD003	Drill	499691.6	3945075.3	1081.8	DGPS Survey	-90	-	172
CHDD004	Drill	499833.3	3944607.1	1140.8	DGPS Survey	-90	-	130.8
CHDD005	Drill	499581.6	3944288.3	1152.9	DGPS Survey	-90	-	104.5
CHDD006	Drill	499705.2	3943972.5	1136.6	DGPS Survey	-90	-	139.25
CHDD007	Drill	500107	3943597.5	1144.2	DGPS Survey	-90	-	81.3
CHDD061	Drill	499678.4	3943791.5	1137.5	DGPS Survey	-75	30	176.7
CHDD063	Drill	500113	3943851.4	1137.6	DGPS Survey	-75	80	114.2
CHDD064	Drill	499432	3944518.4	1107.8	DGPS Survey	-70	170	135.2

### B Trench Data

Site_id	East	North	RL	Survey_method	Length
CHT001	499272.3	3944296.8	1089	DGPS Survey	55.51
CHT002	498959.8	3945839.3	996	DGPS Survey	33.66
CHT003	499845.5	3945838	1001.8	DGPS Survey	32.42
CHT004	499955.9	3945466.4	993.6	DGPS Survey	29.14
CHT005	500034.9	3945156.8	1012	DGPS Survey	19
CHT083	498904	3945767.6	978.5	DGPS Survey	18.56
CHT084	499030.2	3945880.5	996.5	DGPS Survey	30.44
CHT085	499534.4	3945933.7	995.3	DGPS Survey	20.99