

**16M42**

**Technical Report**  
**Três Estradas Phosphate Project,**  
**Rio Grande do Sul, Brazil**  
**Updated Resource Report**

Report Date: October 25, 2017

Effective Date: September 8, 2017

PREPARED FOR:  
Aguia Resources, Ltd.

Prepared By:  
Mr. Steven B. Kerr, C.P.G., Principal Consultant – Geology, Millcreek Mining Group  
Mr. Rainer Stephenson, MMSA-QP, Principal Engineer, Millcreek Engineering  
Mr. Alister D. Horn, MMSA-QP, Principal Consultant, Mining, Millcreek Mining Group

## CERTIFICATE OF QUALIFICATIONS

I, Steven B. Kerr, CPG, PG of Salt Lake City, Utah, do hereby certify that:

1. I am currently employed as a Principal Consultant – Geology at Millcreek Mining Group, 1011 East Murray Holladay Road, Suite 100, Salt Lake City, Utah, USA 84117.
2. I attended Utah State University where I earned a Bachelor of Science degree in Geology in 1981 and a Master of Science degree in Geology in 1987.
3. I am a Certified Professional Geologist with the American Institute of Professional Geologists (CPG-10352). I am licensed as a Professional Geologist in the states of Alaska (#512), Utah (#5557442-2250) and Wyoming (PG-2756).
4. I have worked as a geologist for a total of thirty-three years since my graduation from university, working with companies involved in the mining and exploration of industrial minerals, metallic minerals, and solid fuel energy deposits in North America, South America, Africa, and parts of Asia.
5. I have read the definition of “qualified person” set out in National Instrument (NI) 43-101 and that by reason of my education, affiliation with professional associations (as defined in NI 43-101), and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purpose of NI 43-101.
6. I am responsible for sections 2 through 12, 14, 22, 23, and have contributed to sections 1, 24, 25, 26, and 27 of the technical report titled “Technical Report Três Estradas Phosphate Project, Rio Grande do Sul, Brazil, Updated Resource Report” dated October 25, 2017 (Technical Report) with an **Effective Date of September 8, 2017**.
7. I personally visited and inspected the Três Estradas Phosphate Project from March 17 through March 19, 2016 and March 8 and 9, 2017.
8. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed for which I am responsible make the Technical Report not misleading.
9. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.
10. I have read NI 43-101 and Form 43-101 (F1), and the Technical Report has been prepared in compliance with this instrument and form.

Dated at Salt Lake City, Utah this 25<sup>th</sup> day of October, 2017.

**“ORIGINAL SIGNED AND SEALED BY AUTHOR”**

---

Steven B. Kerr, CPG

## CERTIFICATE OF QUALIFICATIONS

I, Rainer J Stephenson, of Salt Lake City, Utah, do hereby certify that:

1. I am currently employed as a Principal Engineer – Process at Millcreek Engineering Company, 1011 East Murray Holladay Road, Suite 200, Salt Lake City, Utah, USA 84117.
2. I attended University of Utah where I earned a Bachelor of Science degree in Chemical Engineering in 1997.
3. I am a Qualified Professional Member of the Mining and Metallurgical Society of America, Member 01508QP. I am a “qualified person” for the purposes of National Instrument 43-101.
4. I have worked as an engineer for a total of twenty years since my graduation from university, working with companies involved in the mineral processing of industrial minerals, metallic minerals, and solid fuel energy deposits in North America, South America, Australia, and parts of Asia.
5. I have read the definition of “qualified person” set out in National Instrument (NI) 43-101 and that by reason of my education, affiliation with professional associations (as defined in NI 43-101), and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purpose of NI 43-101.
6. I am responsible for sections 13 and have contributed to sections 1, 2 and 25 of the technical report titled “Technical Report Três Estradas Phosphate Project, Rio Grande do Sul, Brazil, Updated Resource Report” dated October 25, 2017 (Technical Report) with an **Effective Date of September 8, 2017.**
7. I personally reviewed the Três Estradas Phosphate Project process design criteria, process flow sheets and metallurgical test data from 2012, 2014, 2015, and 2016.
8. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed for which I am responsible make the Technical Report not misleading.
9. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.
10. I have read NI 43-101 and Form 43-101 (F1), and the Technical Report has been prepared in compliance with this instrument and form.

Dated at Salt Lake City, Utah this 25<sup>th</sup> day of October, 2017.

**“ORIGINAL SIGNED AND SEALED BY AUTHOR”**

\_\_\_\_\_  
Rainer J Stephenson, QP  
Process Engineer – Millcreek Engineering

## CERTIFICATE OF QUALIFICATIONS

I, Alister D. Horn, of Salt Lake City, Utah, do hereby certify that:

1. I am a Principal Consultant - Mining with Millcreek Mining Group, 1011 Murray Holladay Road, Suite 100, Salt Lake City, Utah, 84117 USA.
2. I attended McGill University in Montreal, Canada, where I earned a Bachelor of Engineering degree in Mining in 1996.
3. I am a Qualified Professional Member of the Mining and Metallurgical Society of America, Member #01369QP. I am a “qualified person” for the purposes of National Instrument 43-101.
4. I have worked as a mining engineer for a total of nineteen years since my graduation from university for mining companies and as a consultant specializing in coal, oil shale and industrial minerals throughout the Americas, Africa, Asia and Australasia.
5. I have read the definition of “qualified person” set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with professional associations (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.
6. I have contributed to sections 1, 2, 13, 14 and 25 of the technical report titled “Technical Report Três Estradas Phosphate Project, Rio Grande do Sul, Brazil, Updated Resource Report” dated October 25, 2017 (Technical Report) with an **Effective Date of September 8, 2017**.
7. I personally visited and inspected the Três Estradas property from March 17 through March 19, 2016.
8. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
9. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.
10. I have read NI 43-101 and Form 43-101 (F1), and the Technical Report has been prepared in compliance with this instrument and form.

Dated at Salt Lake City, Utah this 25<sup>th</sup> day of October, 2017.

**“ORIGINAL SIGNED AND SEALED BY AUTHOR”**

---

Alister D. Horn, QP  
Principal Consultant – Mining, Millcreek Mining Group

**TABLE OF CONTENTS**

<b>LIST OF TABLES</b> .....	<b>1-6</b>
<b>LIST OF FIGURES</b> .....	<b>1-8</b>
<b>COMMON UNITS &amp; STANDARDS</b> .....	<b>1-10</b>
<b>COMMON ACRONYMS &amp; ABBREVIATIONS</b> .....	<b>1-11</b>
<b>1 SUMMARY</b> .....	<b>1-1</b>
1.1 LOCATION AND TENURE .....	1-1
1.2 GEOLOGY .....	1-4
1.3 EXPLORATION .....	1-6
1.4 DENSITY AND GRADE ESTIMATION .....	1-8
1.5 RESOURCE CLASSIFICATION .....	1-9
1.6 MINERAL RESOURCES .....	1-10
1.7 METALLURGICAL TESTING .....	1-13
1.8 RECOMMENDATIONS .....	1-14
<b>2 INTRODUCTION</b> .....	<b>2-1</b>
2.1 RECENT PROJECT HISTORY .....	2-1
2.2 TERMS OF REFERENCE .....	2-2
Purpose of Report.....	2-2
2.3 SITE VISIT .....	2-3
2.4 STATEMENTS OF LIMITATION.....	2-3
<b>3 RELIANCE ON OTHER EXPERTS</b> .....	<b>3-1</b>
<b>4 PROPERTY DESCRIPTION AND LOCATION</b> .....	<b>4-1</b>
4.1 OWNERSHIP .....	4-2
4.2 LICENSING PROCESS .....	4-3
4.3 MINING ACTIVITIES IN INTERNATIONAL BORDER ZONES .....	4-5
4.4 SURFACE ACCESS RIGHTS FOR DEVELOPMENT .....	4-5
4.5 ROYALTIES .....	4-5
4.6 ENVIRONMENTAL LIABILITIES.....	4-6
<b>5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY</b> .....	<b>5-1</b>
5.1 ACCESIBILITY.....	5-1
5.2 CLIMATE AND PHYSIOGRAPHY .....	5-3
5.3 LOCAL RESOURCES AND INFRASTRUCTURE .....	5-5
<b>6 HISTORY</b> .....	<b>6-1</b>
<b>7 GEOLOGICAL SETTING AND MINERALIZATION</b> .....	<b>7-1</b>
7.1 REGIONAL STRATIGRAPHY .....	7-1

	7.2	TRÊS ESTRADAS .....	7-1
	7.3	MINERALIZATION .....	7-4
<b>8</b>		<b>DEPOSIT TYPES .....</b>	<b>8-1</b>
<b>9</b>		<b>EXPLORATION .....</b>	<b>9-1</b>
	9.1	GEOLOGICAL MAPPING .....	9-1
	9.2	TOPOGRAPHY .....	9-1
	9.3	REMOTE SENSING .....	9-1
	9.4	SOIL GEOCHEMISTRY .....	9-2
	9.5	ROCK GEOCHEMISTRY .....	9-2
	9.6	TRENCHING .....	9-2
	9.7	GEOPHYSICAL SURVEYS.....	9-2
<b>10</b>		<b>DRILLING.....</b>	<b>10-1</b>
	10.1	DRILLING METHODS .....	10-1
		Exploration Core Drilling .....	10-2
		RC Drilling.....	10-2
		Auger Drilling .....	10-2
	10.2	COMMENTS ON DRILLING.....	10-2
<b>11</b>		<b>SAMPLE PREPARATION, ANALYSES AND SECURITY .....</b>	<b>11-1</b>
	11.1	SAMPLING METHOD AND APPROACH.....	11-1
		Core Drilling .....	11-1
		RC Drilling.....	11-3
		Auger Drilling .....	11-3
		Sample Dispatch.....	11-4
	11.2	SAMPLING ANALYSES .....	11-4
		Soil Samples.....	11-6
		Rock Samples.....	11-6
		Auger, Core and Reverse Circulation Samples .....	11-6
		Specific Gravity Measurements.....	11-6
<b>12</b>		<b>DATA VERIFICATION.....</b>	<b>12-1</b>
	12.1	VERIFICATION OF CORE LOGS.....	12-1
	12.2	DATABASE VERIFICATION .....	12-2
	12.3	QUALITY ASSURANCE / QUALITY CONTROL (QA / QC).....	12-3
		Reference Samples .....	12-4

Blank Samples.....	12-4
Duplicate Samples.....	12-8
Check Assays.....	12-9
Confirmation Testing.....	12-9
QA / QC Conclusions.....	12-10
<b>13 MINERAL PROCESSING AND METALLURGICAL TESTING.....</b>	<b>13-1</b>
13.1 INTRODUCTION / SUMMARY.....	13-1
13.2 'BENCH-SCALE' METALLURGICAL TESTING – HISTORICAL DATA SUMMARY.....	13-3
13.2.1 TECHNOLOGICAL CHARACTERIZATION (EPUSP, 2012).....	13-5
13.2.2 TECHNOLOGICAL CHARACTERIZATION AND FLOTATION (HDA, 2014).....	13-8
13.2.3 FLOTATION TESTWORK (SGS, 2015).....	13-9
13.2.4 FLOTATION AND MAGNETIC SEPARATION TEST WORK (ERIEZ, 2016).....	13-10
13.3 'PILOT-PLANT' METALLURGICAL TESTS AND RESULTS (2017).....	13-12
13.3.1 COMMINUTION TESTING (METSO).....	13-13
13.3.1.1 SAMPLING FOR COMMINUTION TESTING.....	13-13
13.3.1.2 COMMINUTION TESTING PROGRAM.....	13-13
13.3.2 FLOTATION PILOT-PLANT TESTING (ERIEZ, 2017).....	13-18
13.3.2.1 SAMPLING FOR FLOTATION TESTING.....	13-18
13.3.2.2 SAPROLITE TESTING.....	13-18
13.3.2.3 FRESH CARBONATITE TESTING.....	13-23
13.3.2.4 AMPHIBOLITE TESTING.....	13-27
<b>14 MINERAL RESOURCE ESTIMATES.....</b>	<b>14-1</b>
14.1 INTRODUCTION.....	14-1
14.2 RESOURCE DATABASE.....	14-1
14.3 GEOLOGIC MODEL.....	14-2
Statistical Analysis, Compositing and Capping.....	14-3
Variography.....	14-9
Density and Grade Estimation.....	14-10
Resource Classification.....	14-12
Model Validation.....	14-16
14.4 MINERAL RESOURCE ESTIMATE.....	14-25
<b>15 RESERVES.....</b>	<b>15-1</b>
<b>16 MINING.....</b>	<b>16-1</b>
<b>17 MINERALS PROCESSING.....</b>	<b>17-1</b>

18	PROJECT INFRASTRUCTURE .....	18-1
19	MARKET STUDIES AND CONTRACTS .....	19-1
20	HEALTH, SAFETY, ENVIRONMENT AND COMMUNITY RELATIONS CONSIDERATIONS .....	20-1
21	CAPITAL AND OPERATING COSTS .....	21-1
22	ECONOMIC ANALYSIS .....	22-1
23	ADJACENT PROPERTIES .....	23-1
24	OTHER RELEVANT DATA AND INFORMATION .....	24-1
25	INTERPRETATION AND CONCLUSIONS.....	25-1
26	RECOMMENDATIONS.....	1
27	REFERENCES .....	2
28	APPENDIX A: TITLE OPINION SUPPORTING EXPLORATION PERMITS.....	5
29	APPENDIX B: DRILL HOLE DATABASE .....	6

**LIST OF TABLES**

Table 1.1 Summary of Drilling Database.....	1-7
Table 1.2 Model Lithologic Domains .....	1-8
Table 1.3 In-Situ Resource for the Três Estradas Phosphate Deposit.....	1-10
Table 1.4 Três Estradas Pit Optimization Parameters.....	1-11
Table 1.5 Audited Mineral Resource* Estimate, Três Estradas Phosphate Project, Millcreek Mining Group, September 8, 2017 .....	1-12
Table 4.1 Agua Resources, Ltd. Exploration Permits.....	4-2
Table 10.1 Summary of Drilling at Três Estradas .....	10-1
Table 12.1 Selected Core Holes for Detailed Examination .....	12-2
Table 12.2 Database Verification Holes .....	12-2
Table 12.3 Summary of Quality Control Samples for Três Estradas.....	12-3
Table 12.4 Três Estradas Reference Samples .....	12-4
Table 12.5 Blank Sample Characteristics.....	12-5
Table 13.1 Summary of Historical Metallurgical Test Programs .....	13-4
Table 13.2 Chemical Composition.....	13-5
Table 13.3 Mineral Composition.....	13-6
Table 13.4 Sink /Float and Magnetics Separation Results .....	13-7
Table 13.5 Abrasion Index .....	13-14
Table 13.6 Bond Work Index (Ball and Rod Milling) .....	13-15
Table 13.7 Bulk Density and Specific Gravity.....	13-15
Table 13.8 Point Load Tests .....	13-16
Table 13.9 Impact Work Index .....	13-16
Table 13.10 SMC Results .....	13-17
Table 13.11 Coarse and Fine Fractions Particle Size and Phosphate Distribution .....	13-19
Table 13.12 Sapolite - Rougher / Cleaner and Magnetic Separation Results .....	13-22
Table 13.13 Fresh Feed (Whole Core) - Particle Size and Phosphate Distribution.....	13-23
Table 13.14 Fresh Feed (Core Rejects) - Particle Size and Phosphate Distribution .....	13-24
Table 13.15 Flotation Results Summary – Fresh Carbonatite .....	13-25
Table 13.16 Magnetic Separation Results Summary – Fresh Carbonatite.....	13-26
Table 14.1 Summary of Drilling Database .....	14-1
Table 14.2 Model Lithologic Domains .....	14-2
Table 14.3 Block Model Dimensions .....	14-3
Table 14.4 Summary Statistics* of Oxide Grades for Mineralized Domains.....	14-4
Table 14.5 Summary Statistics* of Composite Grades for Mineralized Domains.....	14-7
Table 14.6 Normalized Variogram Parameters Used in the Grade Estimation Process.....	14-9

Table 14.7 Search Parameters for Grade Estimation ..... 14-11  
 Table 14.8 Search Parameters Specific Gravity ..... 14-12  
 Table 14.9 In-Situ Resource for the Três Estradas Phosphate Deposit..... 14-15  
 Table 14.10 General Statistics Comparing Composites to Block Model ..... 14-17  
 Table 14.11 Statistical Comparison of Density Model..... 14-24  
 Table 14.12 Três Estradas Pit Optimization Parameters ..... 14-26  
 Table 14.13 Audited Mineral Resource Estimate\*, Três Estradas Phosphate Project, Millcreek Mining Group, September 8, 2017 ..... 14-27

**LIST OF FIGURES**

Figure 1.1 General Location Map .....	1-3
Figure 1.2 Três Estradas Mineral Tenure .....	1-5
Figure 4.1 General Location Map .....	4-8
Figure 4.2 Três Estradas Mineral Tenure .....	4-9
Figure 5.1 Três Estradas Phosphate Project Location Map .....	5-2
Figure 5.2 Average Monthly Rainfall for the Três Estradas Phosphate Project – INMET Station of Bage (Normal Climate 1961-1990).....	5-3
Figure 5.3 Monthly Temperature Variation in the Três Estradas Phosphate Project Region – INMET Station of Bage (Normal Climate 1961-1990).....	5-4
Figure 5.4 Overview of the Três Estradas Phosphate Project Site .....	5-4
Figure 5.5 Google Image Showing General Layout of Rio Grande Port Area .....	5-5
Figure 7.1 Regional Geologic Setting.....	7-3
Figure 7.2 Três Estradas Geology Map.....	7-5
Figure 9.1 Três Estradas Ground Magnetic Survey.....	9-3
Figure 10.1 Drilling Locations for Três Estradas.....	10-3
Figure 10.2 Section 500NW .....	10-4
Figure 10.3 Section 900NW .....	10-5
Figure 10.4 Section 1200NW .....	10-6
Figure 10.5 Concrete Markers Used to Identify Drill Hole Collars: A) Core Hole marker; B) RC Hole marker .....	10-7
Figure 12.1 Coarse Blanks.....	12-6
Figure 12.2 Fine Blanks .....	12-7
Figure 12.3 Comparison of Duplicate Samples for Três Estradas .....	12-8
Figure 12.4 Comparison of Check Assays with Original Assay Values.....	12-9
Figure 12.5 Comparison of Confirmation Assays with Original Assay Values.....	12-10
Figure 13.1 Two-Stage Automated Column Flotation Circuit.....	13-20
Figure 13.2 Details of Saprolite Flotation Circuit.....	13-21
Figure 13.3 Four-Stage Column Flotation Circuit .....	13-24
Figure 13.4 ‘Bench-top’ Flotation Apparatus .....	13-28
Figure 13.5 Fresh Amphibolite (MAMP) Rougher Flotation .....	13-29
Figure 13.6 Saprolite of Amphibolite (AMPSAP) Rougher Flotation .....	13-29
Figure 13.7 (AMPSAP) Rougher Tails vs 3rd Cleaner Concentrate.....	13-30
Figure 13.8 MAMP Grade vs Recovery Relationship by Collector Type .....	13-30
Figure 13.9 AMPSAP Grade vs Recovery Relationship by Collector Type .....	13-31
Figure 14.1 Perspective View of Modeled 3D Solids from Três Estradas Block Model.....	14-5

Figure 14.2 Sample Length Probability .....	14-6
Figure 14.3 The Top Cut Process for P <sub>2</sub> O <sub>5</sub> .....	14-8
Figure 14.4 Variogram Map for P <sub>2</sub> O <sub>5</sub> Grade in MCBT .....	14-10
Figure 14.5 Example of Stage 2 Resource Coding.....	14-13
Figure 14.6 Comparisons of Measured Model Blocks to Supported Drill Holes .....	14-14
Figure 14.7 Comparisons of Indicated Model Blocks to Supported Drill Holes.....	14-14
Figure 14.8 Kriging Variances .....	14-15
Figure 14.9 Representative Cross-Section.....	14-16
Figure 14.10 Statistical Comparison of P <sub>2</sub> O <sub>5</sub> Block Model Grade Estimates with that of the Compositated Data in Mineralized Amphibolite (MAMP) .....	14-19
Figure 14.11 Statistical Comparison of P <sub>2</sub> O <sub>5</sub> Block Model Grade Estimates with that of the Compositated Data in Saprolitic Amphibolite (AMPSAP).....	14-20
Figure 14.12 Statistical Comparison of P <sub>2</sub> O <sub>5</sub> Block Model Grade Estimates with that of the Compositated Data in Mineralized Carbonatite (MCBT).....	14-20
Figure 14.13 Statistical Comparison of P <sub>2</sub> O <sub>5</sub> Block Model Grade Estimates with that of the Compositated Data in the Saprolitic Meta-Carbonatite (CBTSAP) .....	14-21
Figure 14.14 Swath plots Comparing the P <sub>2</sub> O <sub>5</sub> Block Model Grade Estimates with that of the Compositated Data Along Easting .....	14-22
Figure 14.15 Swath Plots Comparing the P <sub>2</sub> O <sub>5</sub> Block Model Grade Estimates with that of the Compositated Data Along Vertical Direction.....	14-23
Figure 14.16 Histograms of SG Block Model Grade Estimates with that of the Compositated Data for all Major Rock Types .....	14-24
Figure 14.17 Histograms of SG Block Model Grade Estimates with that of the Compositated Data for All Major Rock Types .....	14-25

**COMMON UNITS & STANDARDS**

°	Degree
%	Percent
°C	Celsius
cc	Cubic centimeter
d/y	Days per year
g, G	Gram
ha	Hectares
kg	Kilogram
km	Kilometer
km <sup>2</sup>	Square kilometers
Ktpy	Kilo tonnes per year
ktonnes	Kilo tonnes
kWh	Kilowatt hour
m	Meters
M	Million
mm	Millimeters
MT, Mt	Million tonnes
Mtpy	Million tonnes per year
MVA	Megavolt Ampere
ppm	Parts per million
T, t	Metric tonne (1000kg)
t/y	Metric tonnes per year
t/h	Metric tonnes per hour
t/m <sup>3</sup>	Tonnes per cubic meter
µm	Micrometer, micron

**COMMON ACRONYMS & ABBREVIATIONS**

Al <sub>2</sub> O <sub>3</sub>	Aluminum oxide	NPV	Net Present Value
AMPSAP	Saprolite of Amphibolite	P <sub>2</sub> O <sub>5</sub>	Phosphorus pentoxide
AGR	Agua Resources, Ltd.	PEA	Preliminary Economic Assessment
ASE	Australian Stock Exchange	pH	Potential of hydrogen
BaO	Barium Oxide	PRAD	Plan of Recovery of Degraded Areas
CaCO <sub>3</sub>	Calcium carbonate	QA/QC	Quality Assurance/Quality Control
CaO	Calcium Oxide	QP	Qualified Person
CBTSAP	Saprolite of Carbonatite	R\$	Brazil Real - unit of currency
CCE	Calcium Carbonate Equivalent	R <sup>2</sup>	Correlation coefficient
ENV	effective neutralizing value	RC	Reverse Circulation
Fe <sub>2</sub> O <sub>3</sub>	Iron(III) oxide or ferric oxide	ROM	Run of Mine
GPS	Global Positioning Satellite	RS	Rio Grande do Sul
ICP	Inductively coupled plasma spectrometry	RWi	Rod Mill Work Index
ID	Identification	SAG	Semi-autogenous grinding
IRR	Investment Rate of Return	SG	Specific Gravity
ITR	Independent Technical Report	SiO <sub>2</sub>	Silicon Dioxide
K <sub>2</sub> O	Potassium oxide	SMC	Sag Miller Comminution
LIMS	Low intensity magnetic separation	SP2RE	Rare earth wet drum separator
LOM	Life of Mine	SrO	Strontium Oxide
MAMP	Amphibolite	SSP	Single super phosphate
MCBT	Meta-carbonatite	TiO <sub>2</sub>	Titanium dioxide
MER	Minor Element Ration	US\$	U.S. Dollar - unit of currency
MgO	Magnesium oxide	UTM	Universal Transverse Mercator
MIMS	Medium intensity magnetic separation	WHIMS	High Wet Magnetic Separations
MnO <sub>2</sub>	Manganese dioxide	WMCBT	Weathered Meta-carbonatite
Na <sub>2</sub> O	Sodium oxide	XRF	X-Ray Fluorescence
NaOH	Sodium hydroxide		

## 1 SUMMARY

Agua Resources, Ltd.'s (Agua) Três Estradas Phosphate Project is located in the southern region of the State of Rio Grande do Sul, Brazil. Millcreek Mining Group (Millcreek) was first engaged by Agua in February, 2016 to perform an updated preliminary economic assessment (PEA) of the project. Since the issuance of the PEA, Agua has carried out an extensive drilling campaign that was completed in June 2017. The primary purpose of this drilling campaign was to further delineate resources increasing the geologic assurance and resource classification of the largely inferred resources estimate presented in the PEA with an effective date of June 24, 2016. This Technical Report presents an updated resource estimate to the 2016 estimate and includes the results of the drilling completed in June 2017.

Agua Resources, Ltd. is an exploration and development company focused on Brazilian phosphate projects to supply the Brazilian agriculture sector. Agua is listed on the Australian Stock Exchange (ASE) under the symbol AGR and earlier this year the company was listed on the TSX Venture Exchange (TSX-V) under the symbol AGRL. The company's corporate offices are located in Sydney, Australia and Belo Horizonte, Brazil. The company currently controls over 1,110 km<sup>2</sup> of land in the states of Rio Grande do Sul and Paraíba containing phosphate mineralization through exploration permits it has acquired from the Brazilian National Department of Mineral Production<sup>1</sup> (DNPM). The company seeks to develop its holdings of phosphate deposits into viable mining operations providing phosphate to Brazil's agriculture industry.

Millcreek has prepared this Technical Report on behalf of Agua in accordance with the current requirements of National Instrument (NI) 43-101. In accordance with accepted standards and best-practices for certification of resources, Millcreek personnel have completed two site visits to the Três Estradas Phosphate Project. The first site visit took place between March 17, 2016 and March 19, 2016. Millcreek's representatives included Mr. Steven Kerr (C.P.G.-10352) and Mr. Alister Horn (MMSAQP-01369), who are considered Qualified Persons under the NI 43-101 Standards of Disclosure for Mineral Projects. Mr. Kerr made a second site visit to the project on March 8 and 9, 2017.

### 1.1 LOCATION AND TENURE

The Três Estradas Phosphate Project is located in the municipality of Lavras do Sul, approximately 320 kilometers (km) southwest of Porto Alegre, the capital city of Rio

---

<sup>1</sup>Brazil has recently enacted legislation that will replace the DNPM with the Brazilian Regulatory Mining Agency. Further details are provided in Appendix A (legal title opinion provided by Azevedo Sette Advogados).

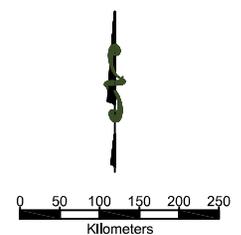
Grande do Sul State in southern Brazil and 1,790km south of Brasilia (Figure 1.1). By road the project area is located approximately 40km west-southwest of Lavras do Sul in a region characterized as low, gently sloping hills and intervening valleys with a mix of Pampas grass lands, shrubs, and small to medium height trees. The Lavras do Sul municipality is connected to Porto Alegre through a network of modern paved highways. A railroad passes through the project area and Lavras do Sul that connects the cities of Cecequi and Rio Grande, the largest port in the state.

Mineral tenure for the Três Estradas Project is held through six mineral rights: three mineral rights in phase of exploration permits; and three mineral rights in phase of exploration permit application, all issued by the DNPM. The six exploration permits combined, cover a total area of 6,203.92ha. Figure 1.2 shows the six exploration permits for the Três Estradas Phosphate Project.



**LEGEND**

- Três Estradas Phosphate Project
- States
- Cities/Towns



**FIGURE 1.1**

**General Location Map**

DATE: 10/02/2017  
By:

Millcreek Mining GROUP

## 1.2 GEOLOGY

The Três Estradas Phosphate Project is situated in the Santa Maria Chico Granulitic Complex (SMCGC), part of the Taquarembó domain. The SMCGC exposes the deepest structural levels within Brazil and may represent the western edge of the Precambrian Rio de la Plata Craton. The granulite complex is bounded to the northeast by the Ibaré Lineament, to the west by Phanerozoic cover, and to the south by Neoproterozoic Brazilian granites (potential melts of the granulite). The age of the granulite protolith is late Archean to early Paleoproterozoic (ca. 2.5-2.3 Ga), and can therefore be interpreted as the basement to the Taquarembó domain and as an extension of the Valentines-Rivera Granulitic Complex within bordering Uruguay.

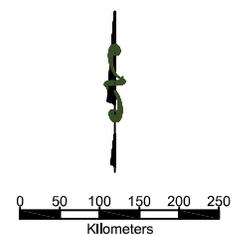
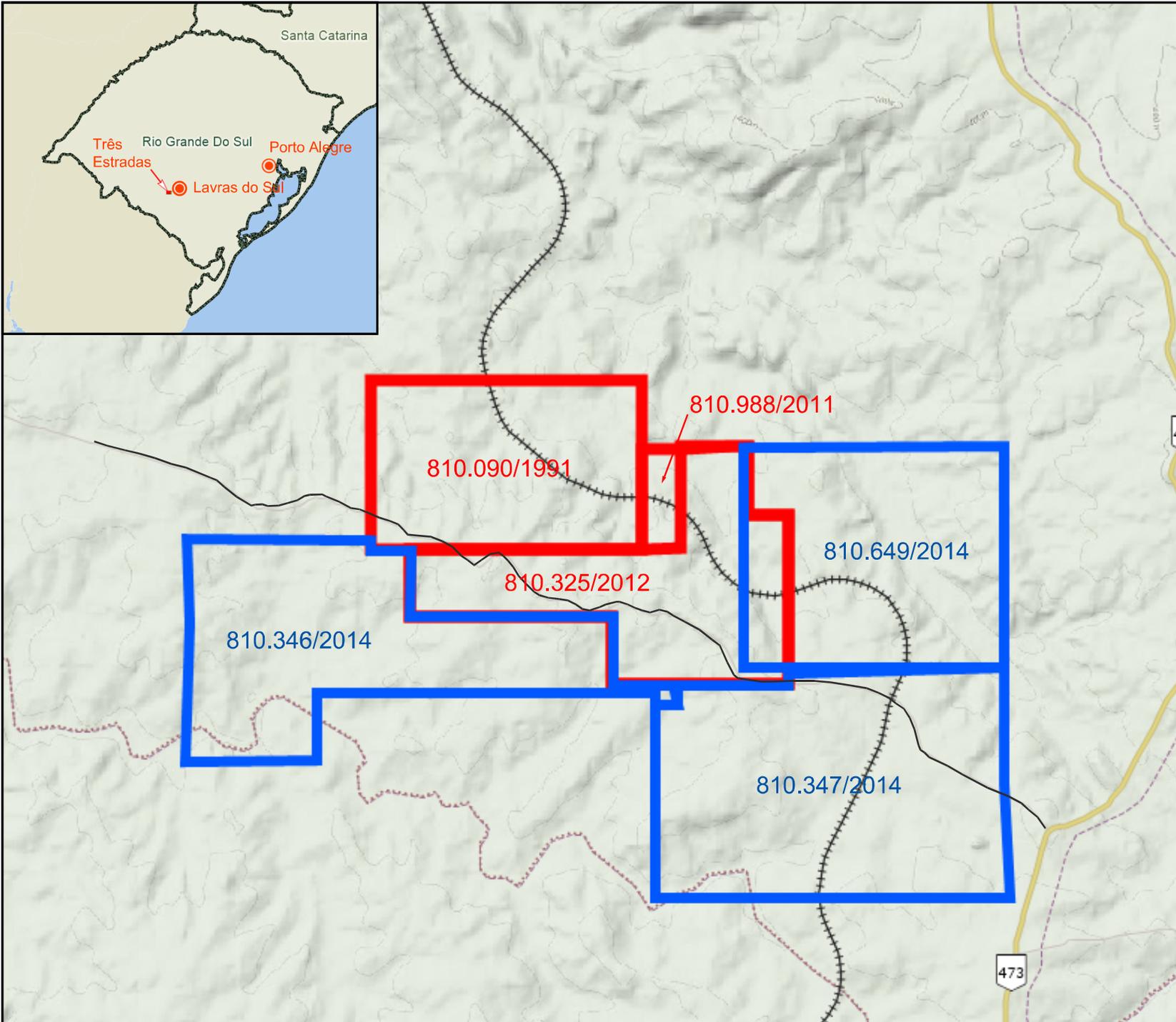
The Três Estradas deposit consists of an elongated carbonatite intrusion (meta-carbonatite and amphibolite) with a strike of 50° to 60°. The meta-carbonatite and amphibolite form a tightly folded sequence with limbs dipping steeply from 70° to vertical (90°). The surface expression of the intrusion is approximately 2.5km along strike with a width of approximately 300m. The Late Archean to Early Proterozoic intrusion is intensely recrystallized and metamorphosed to amphibolite assemblages. The carbonatite intrusion is bound mostly by biotite gneiss along with meta-syenite along its northeast and southeast boundaries

Phosphate mineralization, occurring as the mineral apatite ( $\text{Ca}_5(\text{PO}_4)_3(\text{F},\text{Cl},\text{OH})$ ), is the primary mineralization of economic interest at Três Estradas. Apatite is the only phosphate-bearing mineral occurring in the carbonatites. At Três Estradas phosphate mineralization occurs in both fresh and weathered meta-carbonatite and amphibolite. It also occurs as secondary mineralization in the saprolite directly overlying the meta-carbonatite and amphibolite.



**LEGEND**

- Exploration Permit
- Exploration Permit in Application
- Cities/Towns
- +++++ Railway
- Dirt Road



**FIGURE 1.2**

**Três Estradas  
Mineral Tenure**

## 1.3 EXPLORATION

Agua has been diligent in following a systematic approach in its exploration program for Três Estradas. Agua has undertaken detailed geologic mapping, topographic surveys, remote sensing, soil and rock geochemical surveys, and geophysical surveys. Agua has completed five drilling campaigns on the Três Estradas area beginning in October 2011 and completing the latest drilling campaign in June 2017. Drilling has included 139 core holes (20,509.5m), 244 reverse circulation (RC) holes (7,800.0m), and 487 auger holes (2,481.65m). Agua has followed standard practices in their core, RC, and auger drilling programs. They have followed a set of standard procedures in collecting cuttings and core samples, logging, and data acquisition for the project.

Agua has followed standard practices in their exploration, drilling, and sampling programs. Their procedures are well documented and meet generally recognized industry standards and practices. X-Ray Fluorescence (XRF) for the major oxides has been the primary analytical method employed, supplemented with ion-coupled plasma (ICP) spectrometry, mineralogical and beneficiation tests.

For quality assurance and quality control (QA/QC) of analyses, Agua uses a combination of reference samples, blanks, duplicate samples and umpire check assays. Care has been taken in the sequencing to distribute references and blanks so that references and blanks don't immediately follow each other, though a coarse-grained blank does immediately precede a fine-grained blank to track carryover contamination. The Geology QP has also selected a suite of 85 samples from coarse rejects for comparison testing at an analytical facility not affiliated with the exploration analyses. References, blanks, duplicates and check assays show a strong continuity in the dataset without any significant anomalies. The QPs are of the opinion that the data used in this report adequately depicts the geology and mineralization. The data is sufficient for resource estimation.

During our site visits, Millcreek performed a detailed review of randomly selected core holes for Três Estradas. Cores were directly compared to the original logs prepared by Agua geologists to verify intervals and measurements, lithologic and alteration descriptions. This was followed by a series of verifications to the databases provided to Millcreek. Millcreek reviewed assay certificates applied to the databases for more than 15% of the drill holes representing 15% of the assays in the database. Our review of QA/QC procedures and results show a strong continuity in the dataset without any significant anomalies.

Millcreek has reviewed the methodology and assumptions used by Aguia and has completed a detailed audit of the geologic model and the resource estimation. The resource database used for mineral resource evaluation includes 139 core holes and 244 RC holes as summarized in Table 1.1. Only samples from core and RC drilling are used in modeling and resource estimation.

**Table 1.1 Summary of Drilling Database**

<b>Drilling</b>	<b>Count</b>	<b>Cumulative Meters</b>	<b>Assay Intervals</b>
Core Holes	139	20,509.5	16,046
RC Holes	244	7,800.0	7,800
<b>Total</b>	<b>383</b>	<b>28,309.5</b>	<b>23,846</b>

Aguia has developed a geologic block model of the Três Estradas Property phosphate deposit using GEMS™ software. Modeling was constructed by developing a series of vertical sections spaced at 50m intervals. Three-dimensional shells were developed by linking the vertical sections together with tie lines. Mineralization has an approximate strike length of 2,500m and extends to a depth of 370m below surface. Mineralized zones range in thickness from 5m to 100m. The outer mineralized envelopes were modeled into wireframe solids using a 3.00% P<sub>2</sub>O<sub>5</sub> cut-off grade.

The model recognizes five mineralized, lithologic domains and nine non-mineralized domains as listed in Table 1.2.

**Table 1.2 Model Lithologic Domains**

Typology	Domain	Average Ordinary Kriging Density	Block Model Code	Description
MINERALIZED	CBTSAP	1.60	120	Saprolite of Carbonatite
	WMCBT	2.80	110	Weathered Carbonatite
	MCBT	2.85	100	Meta-Carbonatite
	AMPSAP	1.65	220	Saprolite of Amphibolite
	MAMP	2.87	200	Amphibolite
WASTE	AMPSAP-WASTE	1.77	22	Saprolite of Amphibolite Waste
	WMAMP-WASTE	2.83	21	Weathered Amphibolite Waste
	MAMP-WASTE	2.91	20	Amphibolite Waste
	W-SAP	1.81	32	Saprolite Waste (Meta-Syenite, Gneiss)
	W-WEATH	2.59	31	Weathered Waste (Meta-Syenite, Gneiss)
	W-ROCK	2.68	30	Fresh Rock Waste (Meta-Syenite, Gneiss)
	CBTSAP-WASTE	1.63	42	Saprolite of Carbonatite Waste
	WMCBT-WASTE	2.76	41	Weathered Carbonatite Waste
	MCBT-WASTE	2.80	40	Meta-Carbonatite Waste

#### 1.4 DENSITY AND GRADE ESTIMATION

All estimations are based on a homogeneous block model. The variography studies were performed on the six oxides ( $P_2O_5$ , CaO,  $Al_2O_3$ ,  $Fe_2O_3$ , MgO, and  $SiO_2$ ) for the five mineral domains and for specific gravity of MCBT and MAMP. Variography for the six oxides shows a preference in orientation that is nearly coincidental to the strike and dip of the meta-carbonatite and the Cerro dos Cabritos Fault. Variograms for specific gravity are omnidirectional. The variograms were normalized before running the resource estimation.

The estimation for the six oxide variables ( $P_2O_5$ , CaO,  $Al_2O_3$ ,  $Fe_2O_3$ , MgO, and  $SiO_2$ ) and specific gravity were done using ordinary kriging interpolation for all the domains: MCBT, WMCBT, MAMP, CBTSAP and AMPSAP. All estimations are based on 1.0m composites on a homogeneous block model with unitary dimensions of 12m N, by 6m E, and 10m in elevation rotated 40° in a clock-wise direction. Three estimation passes were used with progressively relaxed search ellipsoids and data requirements based on the variography.

- Pass 1: Blocks estimated in the first pass using half the distance of variogram range and based on composites from a minimum of three boreholes;

- Pass 2: Blocks estimated in the first two passes within the full range of the variogram and based on composites from a minimum of two boreholes; and
- Pass 3: All remaining blocks within the wireframe limits in an unconfined search not classified in the first two estimation passes.

## 1.5 RESOURCE CLASSIFICATION

The resource classification was completed in a two-stage process. In the first stage, relevant mathematical parameters interpolation pass (pass), closest distance of a sample to block center (mindist), average distance of samples to block center (avdist), number of drill holes used for estimating a block (nndh) and kriging variance of estimation (kvar) are saved for the second stage of the process. The second stage uses the above parameters as a guide for manually coding the resource blocks. By following this two-stage process, the following conditions were met for resource classification:

- i. Most of **Measured** category blocks were supported by three or more holes and nearly 20 composites;
- ii. **Measured** category blocks have at least one drill hole within half of the variogram range (major axis);
- iii. Most of **indicated** category blocks are supported by at least two drill holes and nearly 15 composites;
- iv. Measured category blocks have at least one drill hole within half of the variogram range (major axis);
- v. Remaining blocks with a  $P_2O_5$  grade estimation were coded as an **Inferred** Resource.

The two-stage process of classifying resources follows a ‘best practices’ approach allowing the QP to ensure that unreasonable conditions of: 1) measured blocks and inferred category blocks occurring side-by-side, and 2) the measured and indicated blocks are not dominated by blocks with low sample support, i.e., one drill hole with less than 10 composites<sup>2</sup>. The two-stage approach is a time-consuming process of smoothing the mixed Measured, Indicated and Inferred category blocks. However, this process eliminates the stripe or, spotted dog effect often seen in resource models.

---

<sup>2</sup> Compared to the block height of 10 m, the composites are of 1 m length.

## 1.6 MINERAL RESOURCES

The estimated in-situ resource identifies 87.03Mt of measured plus indicated material with an average grade of 4.5% P<sub>2</sub>O<sub>5</sub>, using a minimum cut-off of 3.0% P<sub>2</sub>O<sub>5</sub> and are shown in Table 1.3. By classification, 76.6% of the in-situ resources identified in the model are Measured and Indicated. The in-situ estimate also identifies 26.58MT of Inferred resource, with an average grade of 3.64% P<sub>2</sub>O<sub>5</sub>, Inferred resources account for 23.4% of the in-situ resource. Approximately 5% of the deposit (4.8Mt) is hosted in the saprolite (CBTSAP & AMPSAP) overlying the meta-carbonatite and amphibolite. The weathered transitional zone (WMCBT) represents 2.6% of the deposit (2.96Mt) and 105.2Mt (92%) of the resource is found in the two fresh rock domains (MAMP & MCBT). This is the in-place estimate without consideration for mining method, recovery, processing or economic constraints.

**Table 1.3 In-Situ Resource for the Três Estradas Phosphate Deposit**

Domain	Class	Volume (m <sup>3</sup> X 1000)	Density (T/m <sup>3</sup> )	In-Situ Tonnes (T X 1000)	Grade (wt. %)					
					P <sub>2</sub> O <sub>5</sub> %	CaO%	MgO%	Fe <sub>2</sub> O <sub>3</sub> %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %
<b>AMSAP</b>	Measured	36	1.54	55	6.63	10.75	9.32	15.19	37.94	7.39
	Indicated	435	1.66	711	4.82	11.31	7.52	15.42	40.08	8.57
	<b>Sub-Total</b>	<b>471</b>	<b>1.65</b>	<b>766</b>	<b>4.95</b>	<b>11.27</b>	<b>7.65</b>	<b>15.4</b>	<b>39.93</b>	<b>8.49</b>
<b>CBTSAP</b>	Measured	501	1.63	812	10.03	18.11	5.42	18.62	28.83	4.75
	Indicated	2,348	1.66	3,862	9.16	16.2	4.56	18.41	31.77	5.87
	Inferred	27	1.64	45	5.41	20.17	5.61	12.17	29.81	6.8
<b>Sub-Total</b>	<b>2,876</b>	<b>1.65</b>	<b>4,719</b>	<b>9.28</b>	<b>16.57</b>	<b>4.71</b>	<b>18.38</b>	<b>31.25</b>	<b>5.68</b>	
<b>WMCBT</b>	Measured	653	2.81	1,833	4.12	33.93	6.76	8.92	13.38	2.16
	Indicated	390	2.79	1,083	4.3	34.35	6.15	8.81	14.53	2.32
	Inferred	16	2.83	45	3.93	33.86	8.13	8.2	11.13	1.8
<b>Sub-Total</b>	<b>1,059</b>	<b>2.8</b>	<b>2,961</b>	<b>4.18</b>	<b>34.09</b>	<b>6.56</b>	<b>8.87</b>	<b>13.76</b>	<b>2.21</b>	
<b>MCBT</b>	Measured	12,139	2.84	34,461	3.8	34.17	8.09	8.01	11.33	1.94
	Indicated	13,637	2.85	38,788	3.64	35.02	7.49	7.6	11.36	2.15
	Inferred	8,574	2.87	24,555	3.58	34.69	7.87	7.61	11.69	2.09
<b>Sub-Total</b>	<b>34,350</b>	<b>2.85</b>	<b>97,804</b>	<b>3.68</b>	<b>34.64</b>	<b>7.8</b>	<b>7.75</b>	<b>11.43</b>	<b>2.06</b>	
<b>MAMP</b>	Measured	233	2.89	671	3.69	19.1	8.89	13.69	33.52	6.44
	Indicated	1,654	2.88	4,751	3.93	19.58	9.05	12.78	33.1	6.78
	Inferred	681	2.85	1,938	3.9	19.3	9.15	12.68	32.78	7.11
<b>Sub-Total</b>	<b>2,568</b>	<b>2.87</b>	<b>7,360</b>	<b>3.9</b>	<b>19.46</b>	<b>9.06</b>	<b>12.84</b>	<b>33.05</b>	<b>6.83</b>	
<b>Total</b>		<b>41,324</b>	<b>2.79</b>	<b>113,610</b>	<b>3.95</b>	<b>32.73</b>	<b>7.72</b>	<b>8.6</b>	<b>13.91</b>	<b>2.57</b>

Millcreek has conducted an audit of the block model prepared by Aguia and of the resources estimated from the model. Millcreek loaded the Três Estradas block model into the Maptek Vulcan® software system, a geology and mine planning software that

competes directly with GEMS. The Millcreek audit and validation of the Três Estradas block model consisted of the visual validation, statistical steps in validation, spatial validation through use of swath plots and a statistical and spatial review of specific gravity.

Millcreek considers the phosphate mineralization at the Três Estradas phosphate deposit to be amenable to extraction using open-pit mining methods and to conventional milling techniques using column flotation. Millcreek has used the Lerchs-Grossman optimizing algorithm to evaluate the profitability of each resource block in the model based on its value. Optimization parameters are derived from subsequent sections of this study that identify the mining, processing and economic constraints and are shown in Table 1.4.

**Table 1.4 Três Estradas Pit Optimization Parameters**

<b>Parameters</b>	<b>Value</b>
Cut-off grade P <sub>2</sub> O <sub>5</sub>	3.0%
Mining Recovery/Mining Dilution	100 / 0
Process Recovery P <sub>2</sub> O <sub>5</sub> Sapolite	87%
Process Recovery P <sub>2</sub> O <sub>5</sub> Fresh	80%
Concentrate Grade Sapolite	35.0%
Concentrate Grade Fresh Rock	32.0%
Overall Pit Slope Angle Sapolite/Fresh Rock	34/51 & 55 Degrees
Mining Cost (US\$/tonne Mined)	1.32
Process Cost (US\$/tonne ROM)	4.06
G&A (US\$/tonne of ROM)	0.79
Selling Price (US\$/tonne of concentrate at 30.2% P <sub>2</sub> O <sub>5</sub> )	\$215
Royalties (CFEM Tax) - Gross	2%
Marketing Costs - Gross	2%
Exchange Rate (US\$ to R\$)	3.2

The optimized pit shell for Três Estradas captures the resources estimated in the block model that have reasonable prospects for economic extraction. The pit optimization results are used solely for the purpose of testing the “reasonable prospects for economic extraction” and do not represent an attempt to estimate mineral reserves. Optimization parameters are derived from recent pilot-plant testing presented in Section 13, updated geotechnical assumptions and findings from the Preliminary Economic Assessment

completed May 12, 2017. The Audited Mineral Resource Estimate is presented in Table 1.5.

**Table 1.5 Audited Mineral Resource Estimate\*, Três Estradas Phosphate Project, Millcreek Mining Group, September 8, 2017**

Resource Classification	Domain	Volume (m <sup>3</sup> X 1000)	Tonnage (T X 1000)	Density (T/m <sup>3</sup> )	P <sub>2</sub> O <sub>5</sub> %	P <sub>2</sub> O <sub>5</sub> as Apatite (%)
Measured	AMSAP	36	55	1.54	6.63	15.70
	CBTSAP	491	796	1.63	10.18	24.11
	WMCBT	602	1,686	2.81	4.24	10.03
	MCBT	11,619	33,004	2.85	3.85	9.12
	MAMP	227	655	2.89	3.72	8.81
<b>Total Measured</b>		<b>12,975</b>	<b>36,196</b>	<b>2.82</b>	<b>4.01</b>	<b>9.50</b>
Indicated	AMSAP	400	653	1.65	5.00	11.85
	CBTSAP	2,330	3,834	1.66	9.21	21.82
	WMCBT	370	1,026	2.78	4.38	10.39
	MCBT	13,000	36,984	2.85	3.67	8.69
	MAMP	1,571	4,517	2.88	3.98	9.43
<b>Total Indicated</b>		<b>17,671</b>	<b>47,014</b>	<b>2.74</b>	<b>4.18</b>	<b>9.91</b>
<b>Total Measured + Indicated Resources</b>		<b>30,646</b>	<b>83,210</b>	<b>2.77</b>	<b>4.11</b>	<b>9.73</b>
Inferred	CBTSAP	27	45	1.64	5.41	12.82
	WMCBT	16	45	2.83	3.93	9.32
	MCBT	7,034	20,247	2.88	3.65	8.64
	MAMP	528	1,508	2.87	3.89	9.22
<b>Total Inferred</b>		<b>7,605</b>	<b>21,845</b>	<b>2.88</b>	<b>3.67</b>	<b>8.69</b>

\* Mineral resources are not mineral reserves and do not have demonstrated economic viability. All numbers have been rounded to reflect relative accuracy of the estimates. Mineral resources are reported within a conceptual pit shell at a cut-off grade of 3% P<sub>2</sub>O<sub>5</sub>. Optimization parameters are stated in Table 1.4.

The Audited Mineral Resource identifies 83.21Mt of measured and indicated material with an average grade of 4.11% P<sub>2</sub>O<sub>5</sub> using a minimum cut-off of 3.0% P<sub>2</sub>O<sub>5</sub>. The estimate also identifies 21.85Mt of inferred material with an average grade of 3.67% P<sub>2</sub>O<sub>5</sub>. By classification, 79% of the resources contained within the optimized pit shell are Measured and Indicated with the remaining 21% of the resource classified as Inferred resource.

The accuracy of resource and reserve estimates is, in part, a function of the quality and quantity of available data and of engineering and geological interpretation and judgment. Given the data available at the time this report was prepared, the estimates presented herein are considered reasonable. However, they should be accepted with the understanding that additional data and analysis

available subsequent to the date of the estimates may necessitate revision. These revisions may be material. There is no guarantee that all or any part of the estimated resources or reserves will be recoverable.

## 1.7 METALLURGICAL TESTING

Metallurgical and process testing began in 2012 with a bench-top study that covered mineralogical composition, particle size distribution and liberation by size fraction. Potential grade-recovery projections were extrapolated, and the study also looked into the applicability of magnetic separation. This led to further work in 2014 which covered comminution and the first specific (bench-scale) flotation test work, and resulted in the conclusion (among others) that the recovery of  $P_2O_5$  through flotation might be commercially viable, and that column flotation should be considered. This was followed by additional test work (HDA, 2015), again at a bench-scale, that confirmed the commercial potential for phosphate recovery through flotation, and provided better understanding of the nature of  $P_2O_5$  by size fraction, and in slimes.

It was at this point that the Eriez Flotation Division (Eriez) was engaged. Eriez had a proven record of designing and implementing column flotation applications at igneous phosphate projects around the world, including in Brazil, and it was determined that they would be well-positioned to develop the understanding the metallurgical nature of the Tres Estradas ore to a point suitable for a feasibility-level study.

Eriez began their engagement with a program in 2016 that produced concentrates from various ore types at a commercially viable level of performance, using column flotation. Preliminary bench-scale testing was performed in order to optimize the process approach which was then tested. As a direct result of this approach, Eriez was able to identify effective optimization of the process, and concluded that flotation grade – recovery performance could be reasonably expected, and that it was a significant improvement over historical (i.e., non-optimized) projections.

Metallurgical and process testing has culminated in Eriez’s most recent pilot-plant testing for flotation (2017), backed-up with a recent comminution study (Metso, 2017). A multi-month study, using bulk samples and performed at Eriez Flotation Division’s pilot-plant facilities in Pennsylvania, USA, has confirmed the earlier bench-scale work and, as well as further improvements in the process design to improve grade - recovery projections. The test work was structured to focus specifically on each of the major ore types, including:

- Phase I: Carbonatite;
- Phase II: Calcite;
- Phase III: Saprolite of Carbonatite;
- Phase IV: Amphibolite (both ‘fresh’, and saprolitic).

The current findings and conclusions from the most recent pilot-plant program are as follows:

- Phosphate grade and recovery are highly dependent on feed size distribution and grade;
- MIMS and WHIMS magnetic separation can improve the concentrate grades by over 2%, and reduce the MER;
- In saprolite of carbonatite, pilot-plant testing projects that a global phosphate recovery of 87% is achievable at a concentrate grade of 35% P<sub>2</sub>O<sub>5</sub>;
- In carbonatite:
  - Typically, recirculation of the second cleaner tails can provide up to a 2.5% increase in P<sub>2</sub>O<sub>5</sub> recovery at a 30% final grade. The percentage of which recovery is expected to increase is highly dependent upon the circuit feed grade and size distribution.
  - The use of additional cleaner stages may be more effective than a scavenger stage (not accounted for in grade – recovery projections);
  - At a feed-grade of 4%, pilot-plant testing projects that a global phosphate of 80% may be achievable at a concentrate grade of 32% P<sub>2</sub>O<sub>5</sub>.
- Testing of the flotation performance for amphibolites, while only at a bench-scale, indicates that the impact of amphibolite on overall plant performance will be negligible.

## 1.8 RECOMMENDATIONS

The latest drilling program completed in June 2017, has been successful in delineating the majority of inferred resources reported in the June 24, 2016 Mineral Resource Estimate to Measured and Indicated Resources. The drilling program has also identified a new zone of mineralization along the southeast side of the Três Estradas Deposit. The new zone of

mineralization is situated in an anticlinal climb to the main deposit, dipping to the southeast. The overall size of the deposit (Measured + Indicated + Inferred) has grown approximately 40%.

Agua has been very successful in delineating a sizeable resource to Measured and Indicated Resources. Agua believes they have delineated a sufficient quantity of resources to move forward with detailed engineering and other related studies to advance the Três Estradas Phosphate Project towards development.

At this time, Millcreek does not see the need to continue with additional exploration drilling. There may be a need at a later date to conduct selective drilling to further delineate a specific part of the deposit, depending on mine planning and design. Likewise, drilling needs may shift towards bulk sampling tests for continued metallurgical testing, geotechnical characterization, and hydrology assessment. The drilling needs for these studies have not been fully assessed at this time.

## **2 INTRODUCTION**

Millcreek Mining Group (Millcreek) has prepared this Technical Report on the Três Estradas Phosphate Project at the request of Aguia Resources, Ltd. (Aguia). The purpose of this report is to present an update to the Mineral Resource Estimate with an effective date of July 7, 2016. The updated Mineral Resource Estimate presented in this report has an effective date of September 8, 2017. Between November 2016 and June 2017, Aguia carried out an extensive drilling campaign focused on further delineating the mineral resources to a higher level of geologic assurance. During this drilling program, Aguia was also successful in identifying a new zone of mineralization along the southeast flank of the Três Estradas deposit. This latest drilling program has been successful in growing the size of the overall deposit as well as increasing a significant majority of the resources to Measured and Indicated levels of resource classification.

Aguia Resources, Ltd. is an exploration and development company focused on Brazilian phosphate projects to supply the Brazilian agriculture sector. Aguia is listed on the Australian Stock Exchange (ASE) under the symbol AGR and earlier this year the company was listed on the TSX Venture Exchange (TSX-V) under the symbol AGRL. The company's corporate offices are located in Sydney, Australia and Belo Horizonte, Brazil. The company currently controls over 1,110 km<sup>2</sup> of land in the states of Rio Grande do Sul and Paraíba containing phosphate mineralization through exploration permits it has acquired from the DNPM. The company seeks to develop its holdings of phosphate deposits into viable mining operations providing phosphate to Brazil's agriculture industry.

### **2.1 RECENT PROJECT HISTORY**

In 2012, SRK Consulting (Canada) Inc., was engaged by Aguia to prepare a geological model and mineral resource estimate for the project, in accordance with the JORC code. The results of additional drilling were incorporated in an updated resource estimate released by Aguia in January, 2013. In April, 2013, permit exploration rights for Três Estradas were granted by the DNPM, and shortly thereafter SRK provided an updated mineral resource Estimate to reflect Aguia's revised permit status.

SRK's updated resource estimate and ITR for 2013 served as the basis for a conceptual mining study / PEA completed in September, 2014. This PEA study was developed and updated during the interim with a summary report released in August, 2015.

In early 2016, Millcreek was engaged by Aguia to complete a new PEA for the Três Estradas Phosphate Project. Significant highlights of this PEA included:

- An updated mineral resource estimate following additional drilling at the Três Estradas deposit plus inclusion of another deposit, Joca Tavares;
- The introduction of column flotation testwork that yielded significantly better recoveries over standard flotation presented in the previous PEA completed by SRK;
- Producing phosphate concentrate to be sold at mine gate versus producing Super Single Phosphate (SSP).

The PEA completed by Millcreek was issued as a JORC compliant report on July 7, 2016. The PEA was later reformatted as an NI 43-101 technical report and issued on May 12, 2017, in support of Aguia's listing on the TSX-V.

## 2.2 TERMS OF REFERENCE

### Purpose of Report

The purpose of this report is to present an update to the Mineral Resource Estimate dated July 7, 2016. The Mineral Resource Estimate presented in this report reflects significant changes from the 2016 estimate, due primarily to the latest drilling program completed in June 2017. Key changes in the Mineral Resource Estimate presented in this report include:

- The previous estimate in 2016, identified 15.07 million tonnes (MT) of Measured plus Indicated resources at a  $P_2O_5$  grade of 4.75% using a 3.0% cut-off. The new estimate identifies 83.2MT of Measured plus Indicated resources at a 4.11%  $P_2O_5$  grade using a 3.0% cut-off. Inferred Resources have dropped from 58.9MT to 21.8MT in the 2017 estimate.
- The overall size of the deposit (Measured + Indicated + Inferred) has grown from 74.7MT to 105.1MT;
- Tighter estimation parameters have been implemented in the 2017 Mineral Resource;
- Rock density values have been incorporated into the block model versus the usage of average density values for each of the mineralized domains;

- The July 2016 Mineral Resource Estimate included resources for the Joca Tavares deposit. There has been no additional work done at Joca Tavares and resources from that deposit are not included in this Mineral Resource estimate.

## 2.3 SITE VISIT

In accordance with accepted standards and best-practices for certification of resources, Millcreek personnel have completed two site visits to the Três Estradas Phosphate Project. The first site visit took place between March 17, 2016 and March 19, 2016. Millcreek's representatives included Mr. Steven Kerr (C.P.G.-10352) and Mr. Alister Horn (MMSAQP-01369), who are considered Qualified Persons under the NI 43-101 Standards of Disclosure for Mineral Projects. Mr. Kerr made a second site visit to the project on March 8 and 9, 2017.

Mr. Kerr and Mr. Horn were accompanied and assisted by various Aguia staff including Dr. Fernando Tallarico, Mr. Thiago Bonas and Mr. Alfredo Nunes during the site visits.

## 2.4 STATEMENTS OF LIMITATION

**The accuracy of resource estimates is, in part, a function of the quality and quantity of available data and of engineering and geological interpretation and judgment. Given the data available at the time this report was prepared, the estimates presented herein are considered reasonable. However, they should be accepted with the understanding that additional data and analysis available subsequent to the date of the estimates may necessitate revision. These revisions may be material. There is no guarantee that all or any part of the estimated resources or reserves will be recoverable.**

**Economic analyses in technical reports are based on commodity prices, costs, sales, revenue, and other assumptions and projections that can change significantly over short periods of time. As a result, economic information in a technical report can quickly become outdated. Continued reference to outdated technical reports or economic projections without appropriate context and cautionary language could result in misleading disclosure.**

### **3 RELIANCE ON OTHER EXPERTS**

As described below, Millcreek has relied, in part, on information from Aguia as well as the opinions and statements of other experts who are not qualified persons. Further details on the sources of this information are included in Section 27.

Millcreek has prepared this report specifically for Aguia. The findings and conclusions are based on information developed by Millcreek available at the time of preparation and data supplied by outside sources. Millcreek staff have not conducted any independent field work for the preparation of this report and have relied on the results of exploration documented in various public reports and on recent drilling data supplied by Aguia.

Aguia has supplied the appropriate documentation that supports the exploration permits it holds with the DNPM of Brazil, believed to be in good standing. The existence of encumbrances to the exploration permits have not been investigated. Other Millcreek personnel assisted in the compilation and digitization of historical data and documents and the information contained within them. All of this work was reviewed and deemed reasonable for this level of study by the authors.

Millcreek has relied on a title opinion supplied by Azevedo Sette Advogados regarding the mineral rights and tenure held by Aguia. This title opinion is provided in Appendix A of this report.

#### **4 PROPERTY DESCRIPTION AND LOCATION**

The Três Estradas Phosphate Project is located in the municipality of Lavras do Sul, approximately 320 kilometers (km) southwest of Porto Alegre, the capital city of Rio Grande do Sul State in southern Brazil and 1,790km south of Brasilia, as shown in Figure 4.1.

The Três Estradas Phosphate Project area is situated at latitude  $-30.906137^{\circ}$ , longitude  $-54.197328^{\circ}$ . Mineral tenure is held through six mineral rights: three mineral rights in the phase of exploration permits and three mineral rights in the phase of exploration permit application, all issued by the DNPM<sup>3</sup> as listed in Table 4.1. The six exploration permits combined cover a total area of 6,203.92ha. Figure 4.2 shows the six exploration permits for Três Estradas.

A legal title opinion for Aguia's mineral holdings for the Três Estradas Phosphate Project is provided by Azevedo Sette Advogados in Appendix A of this report. The title opinion provides a summary of legal opinions for the mineral rights, a general overview of the mining regulatory framework in Brazil, an overview of the corporate structure Aguia and its subsidiaries and detailed information regarding payments made by Aguia in favor of surface owners.

---

<sup>3</sup>DNPM shall be replaced by the Brazilian Regulatory Mining Agency, as detailed in Appendix A (legal title opinion provided by Azevedo Sette Advogados).

**Table 4.1 Agua Resources, Ltd. Exploration Permits**

DNPM Permit	Issuing Date	Period	Expiry Date	Area (ha)	Status	Municipality/State	Title Holder
810.090/1991	4/12/2006	3	8/16/2012	1,000.00	Permit Extension	Lavras do Sul/RS	CBC*
810.325/2012	4/29/2013	3	4/29/2016	900.95	Permit Extension	Lavras do Sul/RS	CBC
810.988/2011	4/15/2015	3	4/15/2018	84.39	Permit	Lavras do Sul/RS	Falcon Petróleo S.A.
810.346/2014	Not Applicable			1,275.66	Permit Application	Lavras do Sul/Dom Pedrito/RS	Agua Fertilizantes S.A.
810.347/2014	Not Applicable			1,702.56	Permit Application	Lavras do Sul/Dom Pedrito/RS	Agua Fertilizantes S.A.
810.649/2014	Not Applicable			1,240.36	Permit Application	Lavras do Sul/RS	Agua Fertilizantes S.A.
				<b>Total Area</b>	<b>6,203.92</b>		

\*Companhia Brasileira do Cobre

#### 4.1 OWNERSHIP

Agua holds 100% interest in the six exploration permits covering the Três Estradas deposit. Two of the exploration permits were issued to Companhia Brasileira do Cobre (CBC) by the DNPM.

On July 1, 2011, CBC and Agua Metais Ltda., a subsidiary of Agua Resources, Ltd. in Brazil, executed an option agreement providing the irrevocable purchase option of these mineral rights by Agua Metais (or its affiliate or subsidiaries). On May 30, 2012, Agua Metais exercised the purchase option concerning the mineral rights of permit #810.090/1991 by means of its affiliate, Agua Fertilizantes S/A (Agua Fertilizantes). On July 20, 2012, CBC filed a request before the DNPM applying for the transfer of this mineral right to Agua Fertilizantes. On May 16, 2013, Agua Metais exercised the purchase option concerning mineral rights of permits #810.325/2012 and #810.996/2010 by means of its affiliate Agua Fertilizantes. On April 07, 2014 CBC filed a request before the DNPM applying for the transfer of those mineral rights to Agua Fertilizantes.

The transfer requests of the mineral rights (#810.090/1991 and #810.325/2012) are under DNPM's analysis. As per the Brazilian mining legislation, in order to be considered lawful and to also have legal effectiveness, the DNPM will analyze technical and legal aspects in order to approve or oppose the transfer. The assignor shall continue to be liable for any rights or covenant regarding the mining title up to the regular register of the full assignment.

The two permits transferred from CBC (#810.325/2012 and #810.988/2011) to Aguia Fertilizantes are currently operating under permit extensions. Moreover, considering that pursuant to Provisional Measure #790, 2017, after the expiration of the exploration permit, the titleholder may proceed with the exploration activities through a prior communication with DNPM (including field exploration activities), Aguia Fertilizantes may execute complementary exploration at its discretion. The third permit, DNPM #810.988/2012, is held by Falcon Petróleo S.A., a subsidiary of Aguia. This permit carries a 2018 expiry date. We understand Aguia will likely file for an extension on this permit as well.

## 4.2 LICENSING PROCESS

Exploration permits are granted for up to a three-year period, renewable for a further period at the decision of DNPM, under the objective conditions stipulated in the mining code. Exploration must begin no later than 60 days after the granting of the permit. Exploration must not stop, without due reason, for more than three consecutive months or 120 non-consecutive days. The permit holder must notify the DNPM of any changes to the exploration plan and, on completion of the work, submit a final report on exploration. The holder of an exploration permit is required to pay annual fees to DNPM in the amount of R\$1.90/ha for the first three years, increasing to R\$2.87/ha for authorized term extensions. The holder of an exploration permit is also responsible for all expenses related to DNPM site inspections of the area.

Mining concessions are granted, solely and exclusively, to individual firms or companies incorporated under Brazilian law, which have head offices and management in Brazil, and are authorized to operate as a mining company.

Mining concessions can be applied for upon the presentation of: (i) a mining plan within one (1) year<sup>4</sup>, counted from the approval of the final exploration report by

---

<sup>4</sup>. Upon holder request, this term may be renewable for one (1) year at DNPM's discretion.

DNPM; and (ii) installation license issued by environmental license. The mining plan must include an economic feasibility analysis, and the company must demonstrate to the DNPM that it has the financial capability to carry out the forecasted plan. The application for a concession must also include a Plan for Recovery of Degraded Areas (PRAD) covering water treatment, soil erosion, air quality control, re-vegetation or reforestation and site reclamation. Once the legal and regulatory requirements are met, a mining concession is granted. The terms of the concession will include conditions concerning mitigating environmental impact, site safety, construction codes, waste disposal and site reclamation.

The holder of a mining concession shall also comply with the Compensation for the Exploitation of a Mineral Resource (CFEM), which is a legal royalty based on the type of commodity and levied on the sale of the ore, discounted of marketing taxes, external transportation and insurance. Mining companies that verticalize their operations (i.e., industrialize the ore) calculate royalty not on the proceeds from sales of the industrialized product, but rather on the cost of extracting and processing the ore up to the stage of the production process immediately before industrialization occurs. The owner of the surface rights must also be financially compensated for the occupation of the land and indemnified in case of damages caused by the mining activities.

The company holding the mining concession has the right to mine the deposit until it is completely exhausted according to the mining plan approved by DNPM and the environmental license granted by the relevant agency. The mined product can be disposed of without any restriction except general taxation. The concession holder also has the right to sell, transfer or lease the mining rights to another mining company, with prior consent of the federal government.

Work described in the mining plan must start no later than six months from the publication of the granting notice in the Federal Gazette. Once mining activity has begun it must not be suspended, without due reason, for more than six months without risking the penalty of possible cancellation of the concession. Annual statistical data on production must be reported to DNPM which will also send representatives on periodic site inspections.

## 4.3 MINING ACTIVITIES IN INTERNATIONAL BORDER ZONES

Both project areas fall within the International Border Zone of Brazil. The International Border Zone is a 150km buffer zone to the country's international borders. Três Estradas is within this zone with respect to the Uruguay border. The mining activities in border zones are ruled by special laws. According to Federal Law No. 6.634/1979 and Decree No. 85.064/1980, mining activities in border areas must be submitted to prior approval of the National Defense Council. Companies interested in performing mining activities within the border areas must fulfill these requirements:

- At least 51% of the company's capital shares be held by Brazilians;
- At least two-thirds of the employees involved in the mining activities must be Brazilian citizens;

The management of the company must be exercised by a majority of Brazilian individuals.

## 4.4 SURFACE ACCESS RIGHTS FOR DEVELOPMENT

As project development moves forward, Aguia will need to secure surface access rights for the lands it intends to develop. Aguia has engaged Vaz de Mello, an independent consulting company to assess property values and to assist in discussions and negotiations with property owners to secure surface rights for the lands needed to develop the project. The land acquisition model Aguia intends on using is to close an option agreement with a 10% down payment upon signature and legal due diligence followed with the remaining 90% due upon issuance of the Construction License granted by FEPAM, the State Environmental Protection Foundation.

## 4.5 ROYALTIES

Under terms of the option agreement, Companhia Brasileira do Cobre ("CBC") is entitled to receive royalties levied at the rate of 2% (two percent) of the net revenue (capped at \$10M) that results from the commercialization of the mineral products for Três Estradas. However, Aguia may, at any time, purchase the royalty right from CBC for US\$5,000,000, and indeed have communicated that they intend to do so.

Agua entered into an Offer Letter and Agreement with Sulliden Mining Capital Inc. (Sulliden) on November 3, 2014. The agreement provided Agua Aus\$2,000,000 in exchange for 40,000,000 shares of AGR stock to Sulliden plus a 1% (one percent) net smelter returns royalty (applies to sale of all minerals, metals, concentrates, or other phosphate extracted or derived from ore mined from the property). It is understood that Agua may purchase the royalty right from for US\$1,000,000, with a deadline of November 2017. For this study, it is assumed that Agua will indeed purchase these royalty rights by the deadline (Year -3).

Finally, as explained in Sections 4.2 and 22.2.2, a CFEM royalty of 2% on net smelter returns, payable to the Brazilian government, has been estimated.

## 4.6 ENVIRONMENTAL LIABILITIES

Properties required for the development of the open pit, beneficiation plant, tailings dam, water dam and waste piles are in the process of being acquired by Agua Fertilizantes.

Agua Fertilizantes is not aware of any environmental liabilities or any royalties attached to the properties already acquired and those identified for purchase.

Current environmental liabilities are limited to cut lines for drilling, drill pad clearings, mud pumps and various infrastructures.

The Project will comply with the environmental provisions of the Brazilian Constitution and mining code, including:

- The rehabilitation of the surface soil or other areas adjacent to the mine or deposit in accordance with a rehabilitation plan or land use, concurrently, or with other work required in case of closure or cessation of work;
- The reinstatement of forests or other areas whose integrity has been impaired as a result of mining activities; and
- The work of exploration or exploitation of a mine or quarry will be in compliance with the obligations relating to:
  - Safety and health of personnel and the population;
  - Protection of the environment;

- Preservation of the mine;
- Conservation of buildings, ground safety and soundness of dwellings;
- Conditions of environmental permit license.

To the extent known, the QPs are not aware of any significant factors or risks besides those noted in this Technical Report that may affect access, title, or the right or ability to perform work on the property.



LEGEND

- ★ Três Estradas Phosphate Project
- States
- Cities/Towns

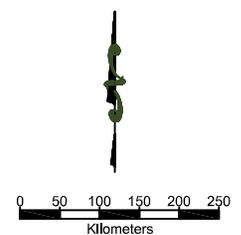


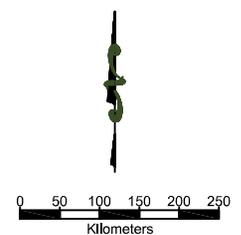
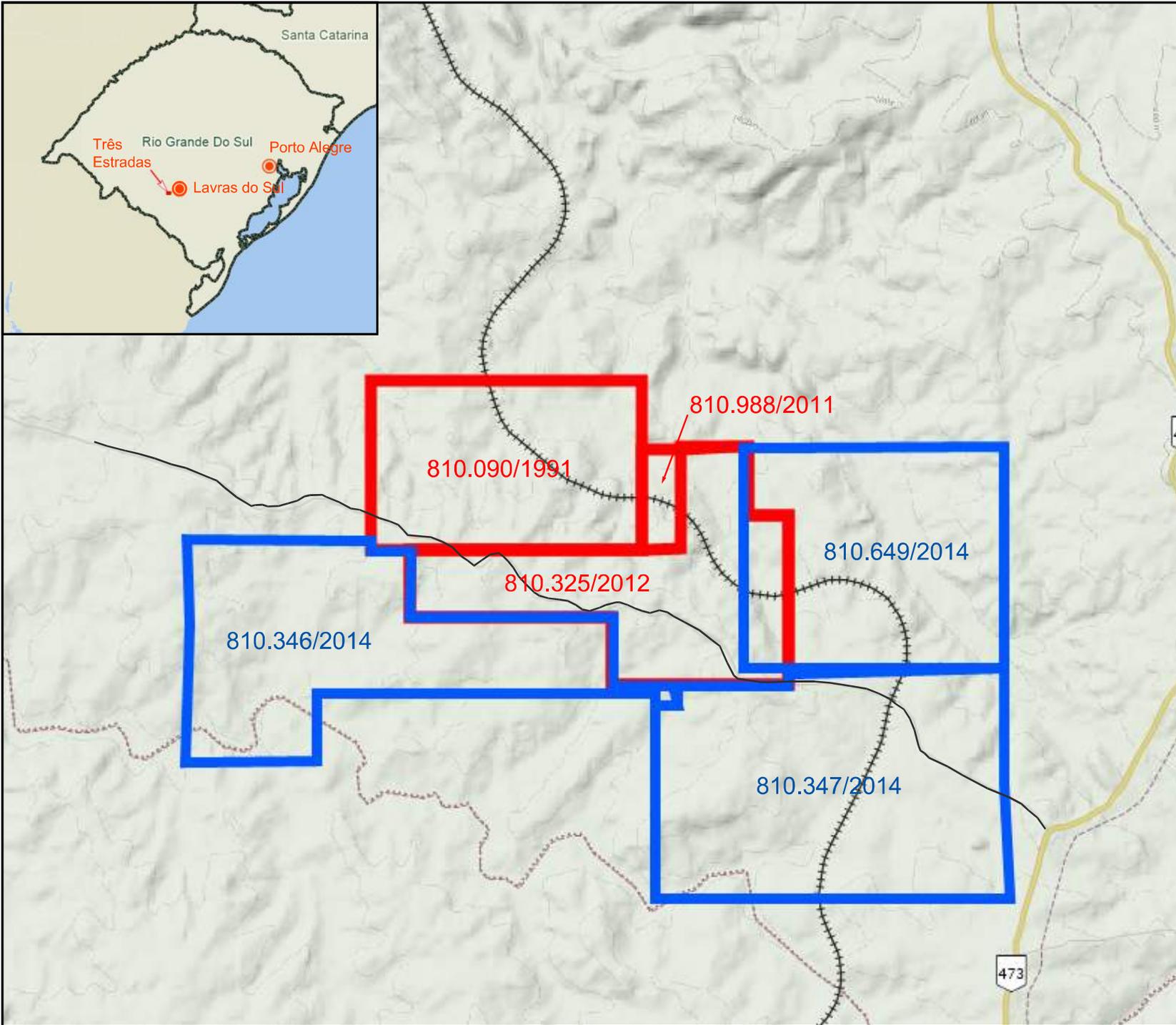
FIGURE 4.1

General Location Map



**LEGEND**

- Exploration Permit
- Exploration Permit in Application
- Cities/Towns
- +++++ Railway
- Dirt Road



**FIGURE 4.2**

**Três Estradas  
Mineral Tenure**

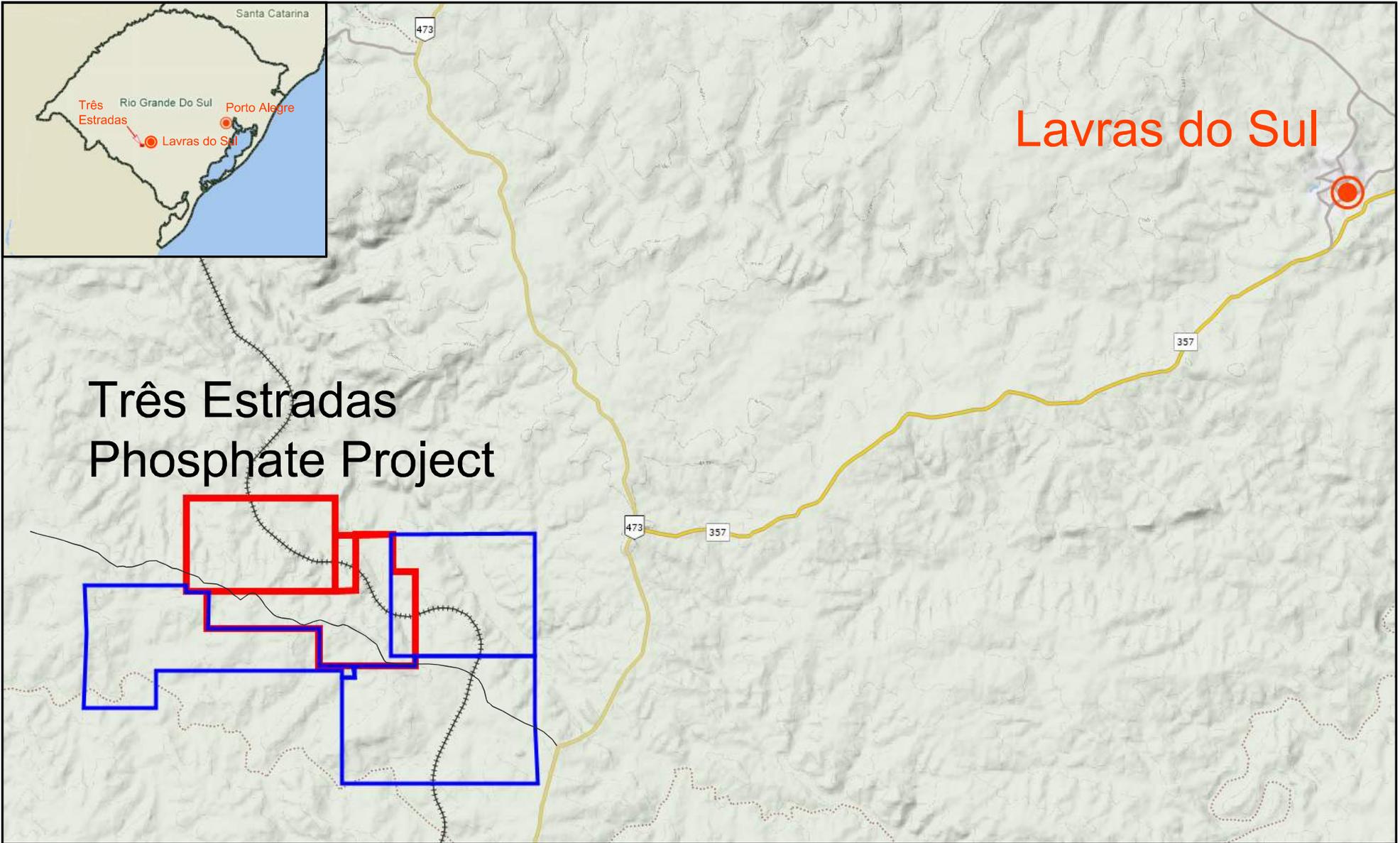
## **5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY**

### **5.1 ACCESIBILITY**

The Três Estradas Phosphate Project is located approximately 30km southwest of Lavras do Sul, located in the south-central portion of the state of Rio Grande do Sul. The project area is located approximately 320km from Porto Alegre, the capital and largest city of Rio Grande do Sul State. Porto Alegre is a major metropolitan hub to the region with a population of approximately 4.4 million inhabitants and serviced by an international airport. A network of modern paved highways connect Lavras do Sul to Porto Alegre and other communities throughout the region. Highways BR-290, BR-392, and BR-357 are the primary links from Porto Alegre to Lavras do Sul.

Lavras do Sul is a community of 8,300 inhabitants. The town has a history founded in gold mining dating back to the 1880s. The town has a well-developed infrastructure, including an airstrip for small planes, availability of unskilled and semi-skilled mining personnel and access to non-specialized supplies. Aguia bases its field operations in Lavras do Sul with an office complex and core storage facility.

From Lavras do Sul, the Três Estradas Phosphate Project area is accessed by RS-357, southwestward for approximately 23km, then south on BR-473 for 7km to an intersection with a secondary ranch road (Figure 5.1). The southeast corner of the property is located another 10km northeast on the ranch road from the intersection with BR-473.



Lavras do Sul

Três Estradas  
Phosphate Project

- Exploration Permit
- Exploration Permit in Application
- Cities/Towns
- Railway
- Dirt Road

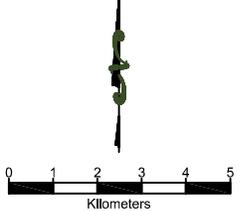
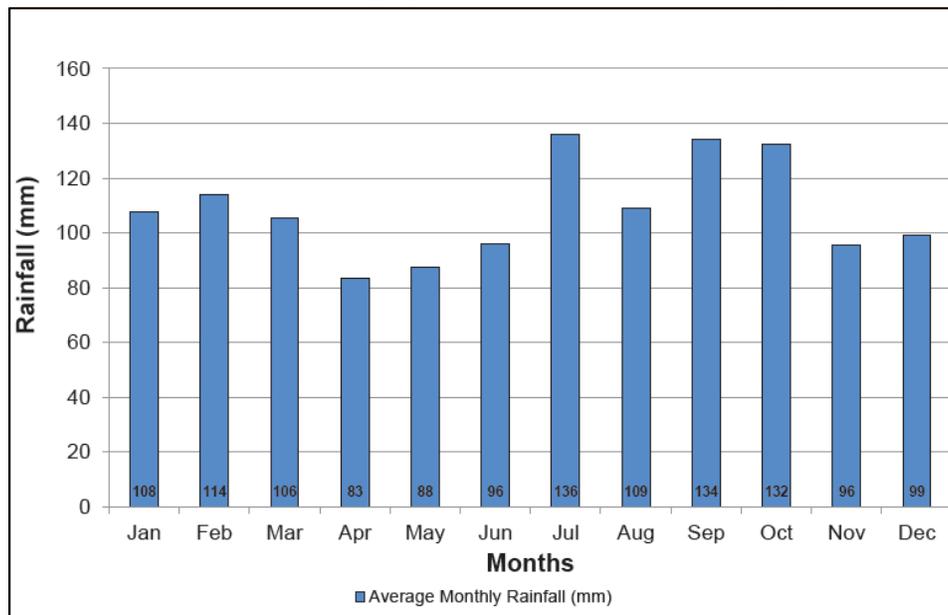


FIGURE 5.1	
Aguia Resources Ltd. Três Estradas Phosphate Project Location Map	
DATE: 10/19/2017 By: <i>Steve C. Hays</i>	<b>Millcreek Mining</b> <small>GROUP</small>

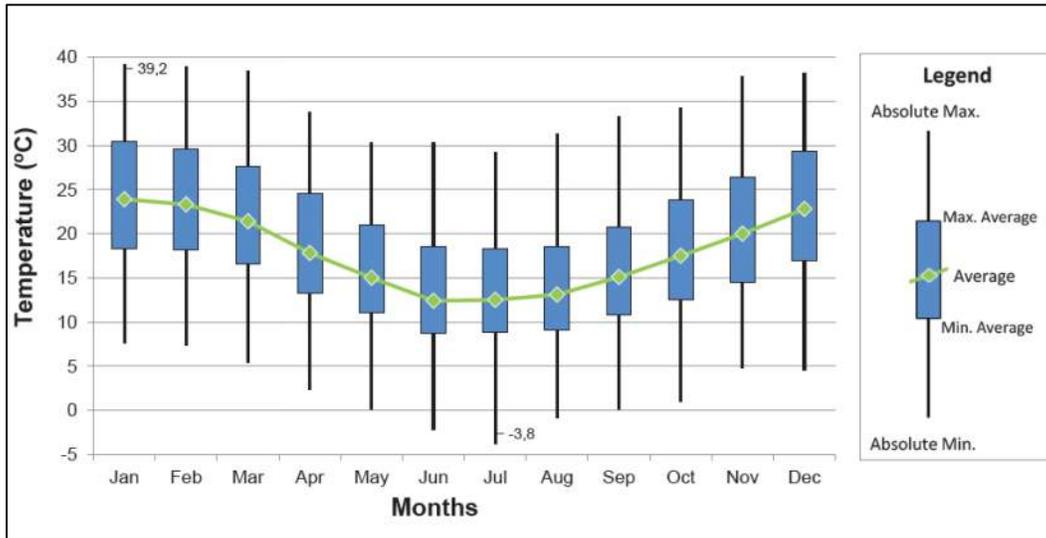
## 5.2 CLIMATE AND PHYSIOGRAPHY

The region has a humid subtropical climate. Annual precipitation ranges from 1,300 to 1,800 millimeters (mm) and is relatively uniform throughout the year. April, May, November and December are typically the driest months of the year where monthly rainfall may fall below 100mm (Figure 5.2). Temperature ranges from 0° to 22°C between April and September and 13° to 30°C from October to March. Frost is known to occur during the winter months and temperature occasionally reaches 40°C in the summer (Figure 5.3).

**Figure 5.2 Average Monthly Rainfall for the Três Estradas Phosphate Project – INMET Station of Bage (Normal Climate 1961-1990)**



**Figure 5.3 Monthly Temperature Variation in the Três Estradas Phosphate Project Region – INMET Station of Bage (Normal Climate 1961-1990)**



The landscape surrounding Lavras do Sul and the Três Estradas deposit can be characterized as low, gently sloping hills. The gentle hills and intervening valleys are a mix of Pampas grass lands, shrubs and small to medium height trees. Três Estradas Phosphate Deposit is located between two hydrographic basins: the Santa Maria River Basin and the Camaquã River Basin. Elevation for the Três Estradas project area ranges from 249m to 367m with a mean elevation of 348m MSL for the deposit area (Figure 5.4).

**Figure 5.4 Overview of the Três Estradas Phosphate Project Site**



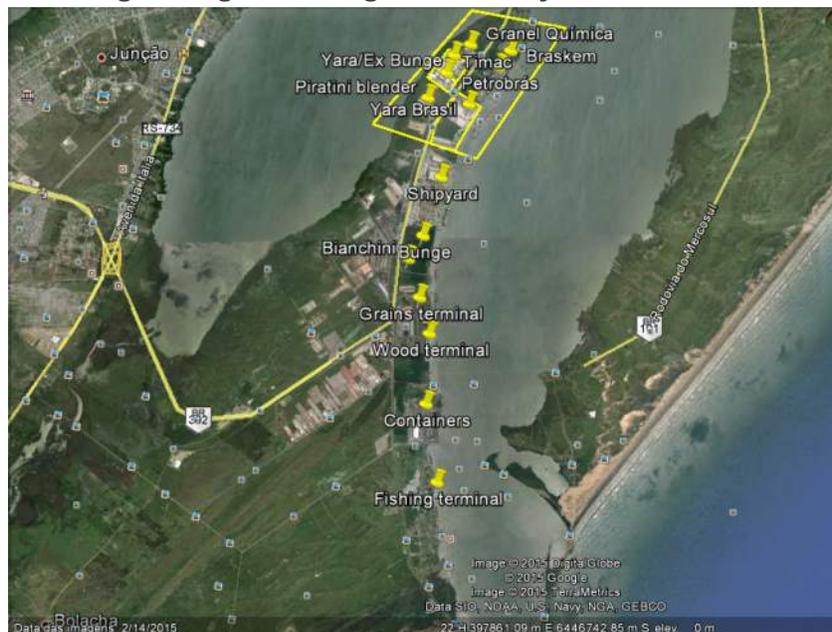
## 5.3 LOCAL RESOURCES AND INFRASTRUCTURE

Electric power for the region is provided by Companhia Estadual de Energia Elétrica (CEEE – State Electric Power Company). CEEE has 62 substations in Rio Grande do Sul with a total capacity of 8,237.4MVA and 6,056km of transmission lines that are supported by 15,058 structures and operate voltages of 230, 138, and 69 kilovolts.

The water supply in the Lavras do Sul and Bagé municipalities is managed by the Rio Grande do Sul State water utility, CORSAN. Regional water demands are carefully managed during the summer months when demand is high due to local rice farming in order to avoid impact on the urban supply. Agüia has retained Walm Engenharia, a local consulting firm, to provide hydrological assessment for the project. Walm has recommended that water to the project area should be supplied through the development of small reservoirs or dams to manage water flow from local streams.

A railroad crosses through the Três Estradas Phosphate Project area and through Lavras do Sul. The railroad is operated by RUMO Logistics and links the cities of Cecequi and Rio Grande. The city of Rio Grande is the largest port in the state. Figure 5.5 is a Google image of the Rio Grande port area and delineates the area utilized by the fertilizer and petrochemical industries.

**Figure 5.5 Google Image Showing General Layout of Rio Grande Port Area**



## 6 HISTORY

Lavras do Sul was originally developed in the 1880's as a gold mining camp on the Camaquã of Lavras River. In 1959, more detailed studies were organized by the DNPM, which were followed in the 1970s by major survey and sampling programs of all mineral occurrences by the Companhia de Pesquisa e Recursos Minerais (CPRM – The Geological Survey of Brazil). In recent years there have been renewed exploration activities for gold and base metals in the region by Companhia Brasileira do Cobre (CBC), Amarillo Mining, Companhia Riograndense de Mineração (CRM) and Votorantim Metais Zinco SA.

Phosphate mineralization was first observed at Três Estradas in a gold exploration program being conducted jointly by Santa Elina and CBC. Santa Elina was prospecting for gold in DNPM #810.090/1991, conducting soil, stream sediment and rock geochemistry, ground geophysical surveys (magnetometry and induced polarization) and a limited drilling program.

Results of the soil sampling and drilling program led to the discovery of phosphate-rich rocks. A total of 944 soil samples were collected in a regular North-South grid of 400m by 500m and within detailed grids ranging from 25m by 50m to 200m by 50m.

Exploration results for gold were not encouraging and Santa Elina pulled out of the joint venture with CBC. However, the phosphate chemical analysis from two core boreholes in the DNPM #810.090/1991 area yielded results of 6.41% P<sub>2</sub>O<sub>5</sub> from soil and 6.64% P<sub>2</sub>O<sub>5</sub> from core. This information was communicated to CPRM. Following petrographic studies, apatite mineralization occurring in carbonatite was confirmed. This discovery was published in the proceedings of the 45<sup>o</sup> Congresso Brasileiro de Geologia (Brazilian Geology Congress), in Belém, Pará (Parisi et al., 2010), and in the Simpósio de Exploração Mineral (SIMEXMIN), in Ouro Preto, MG, in 2010 (Toniolo et al., 2010).

In July 2011, CBC entered into a partnership with Aguia Metais Ltda, a subsidiary of Aguia Resources, Ltd, to explore and develop phosphate deposits in Rio Grande do Sul State. The two companies entered into an option agreement providing Aguia the irrevocable purchase option for phosphate mineral rights. Aguia exercised the purchase option the following year, granting them 100% interest in the Três Estradas deposit. Since 2011, Aguia has carried out a systematic and detailed exploration program to delineate phosphate mineralization at the deposits.

## **7 GEOLOGICAL SETTING AND MINERALIZATION**

### **7.1 REGIONAL STRATIGRAPHY**

The region surrounding Lavras do Sul consists of geologic domains within the Sul-riograndense Shield, a major lithotectonic assemblage in southernmost Brazil, which includes a Paleoproterozoic basement and Neoproterozoic orogenic belts linked to the Brasiliano/Pan-African cycle (Figure 7.1).

The Três Estradas Phosphate Project is situated in the Santa Maria Chico Granulitic Complex (SMCGC), part of the Taquarembó domain. The SMCGC exposes the deepest structural levels within Brazil and may represent the western edge of the Precambrian Rio de la Plata Craton. The granulite complex is bounded to the northeast by the Ibaré Lineament, to the west by Phanerozoic cover and to the south by Neoproterozoic Brasiliano granites (potential melts of the granulite). The age of the granulite protolith is late Archean to early Paleoproterozoic (ca. 2.5-2.3 Ga), and can therefore be interpreted as the basement to the Taquarembó domain and as an extension of the Valentines-Rivera Granulitic Complex within bordering Uruguay.

The granulitic complex and post-tectonic granites are largely surrounded by volcanic and sedimentary cover rocks of the Camaquã Basin. These rocks were deposited as a result of Neoproterozoic to Early Cambrian post-orogenic extension.

### **7.2 TRÊS ESTRADAS**

The Três Estradas Phosphate Project area is situated in the SMCGC, south of the northwest trending Ibaré Lineament (Figure 7.2). The area is characterized by Late Archean to Early Proterozoic rocks of the granulite complex and Neoproterozoic felsic intrusive and sedimentary rocks of the Camaquã basin. The area has undergone amphibolite grade metamorphism and significant deformation throughout and following the emplacement of the granulite complex. This was followed by felsic intrusions and deposition of cover rocks during the formation of the Camaqua Basin during the Neoproterozoic and into the early Cambrian. The dominant rock types found within the local confines of the Três Estradas Phosphate Project include:

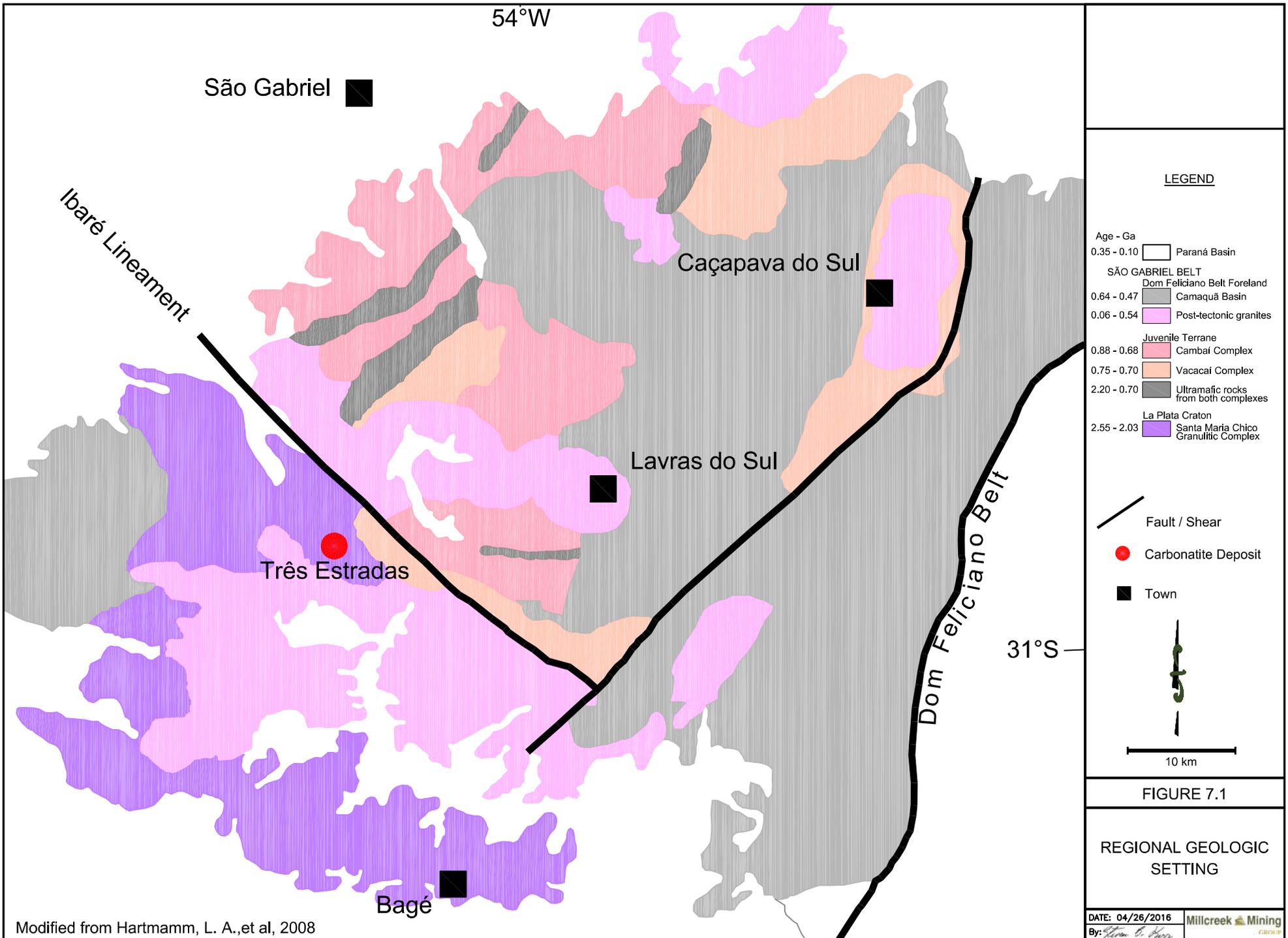
Intermediate gneiss, amphibolite, schist, and metatonalite of the SMCGC. These lithologies have been strongly deformed and metamorphosed to amphibolite assemblages. They are interpreted to have experienced deformation during at least two

tectonic events during the Paleo and Neoproterozoic, and subsequently have been affected by retrograde amphibolite metamorphism.

- Granites belonging to the São Gabriel Domain. Granites from this domain are poorly exposed. Where exposed the granites show little evidence of deformation, though extensive quartz veins trending parallel to the Cerro dos Cabritos Fault are common where they are in contact with gneiss of the SMCGC.
- The Três Estradas meta-carbonatite. The meta-carbonatite is intensely recrystallized and metamorphosed to amphibolite assemblages. The carbonatite intrusion is characterized by three magmatic phases: apatite bearing pyroxenite, carbonatite and syenite.
- Medium to coarse grained, subangular to subrounded poorly sorted, white to grey sandstone of the Maricá Formation, a component of the Camaquã Basin sedimentary cover units. This unit is characterized by cross bedding, lenses of polymictic conglomerates and rhythmites associated with sandy to pelitic turbidites; and
- Quartz veins are common and are both concordant and crosscutting all lithologies. The veins can reach widths of up to 30m and can reach strike extents of up to 300m.

The majority of the Três Estradas phosphate project area is composed of the major rock types described above. The targeted area consists of an elongated carbonatite intrusion with a strike of 50° to 60° similar to that of the Cerro dos Cabritos Fault. Shear sense indicators suggest a sinistral sense of motion along this fault. The carbonatite and amphibolite form a tightly folded sequence with limbs dipping steeply from 70° to vertical (90°). The surface expression of the intrusion is approximately 2.5km along strike with a width of approximately 300m.

With the exception of meta-syenite along its northeast and southeast boundaries, the carbonatite is surrounded by biotite gneiss of the SMCGC. The carbonatite is tightly folded and strongly foliated, resulting in a well-developed gneissic texture. Locally, abundant subparallel quartz veins are present resulting in elevated topographic ridges as the quartz is more resistant to weathering than the surrounding country rock. These veins range from a few centimeters to a couple of meters in width and can be up to 300m long. Also, flanking the carbonatite is a minor unit of meta-tonalite with intercalated meta-carbonatite and amphibolite. The unit is characterized by gneissic banding, a gray-green color on weathered surfaces and a recrystallized granular texture.



**LEGEND**

- Age - Ga
- 0.35 - 0.10  Paraná Basin
- SÃO GABRIEL BELT
- Dom Feliciano Belt Foreland
- 0.64 - 0.47  Camaquã Basin
- 0.06 - 0.54  Post-tectonic granites
- Juvenile Terrane
- 0.88 - 0.68  Cambai Complex
- 0.75 - 0.70  Vacacai Complex
- 2.20 - 0.70  Ultramafic rocks from both complexes
- La Plata Craton
- 2.55 - 2.03  Santa Maria Chico Granulitic Complex

- Fault / Shear
- Carbonatite Deposit
- Town

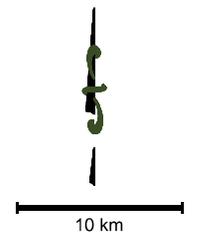


FIGURE 7.1

REGIONAL GEOLOGIC SETTING

Modified from Hartmann, L. A., et al, 2008

The carbonatite intrusion is characterized by varying amounts of amphibolite. Amphibolite and carbonatite bands alternate on a meter- to millimeter-scale. Phosphate mineralization is disseminated and contained in apatite crystals throughout the carbonatite intrusion and in the overlying saprolite (discussed in detail in following section). Aguia's current interpretation suggests that the carbonatite intrusion is formed from three magmatic phases that were later metamorphosed to an amphibolite assemblage.

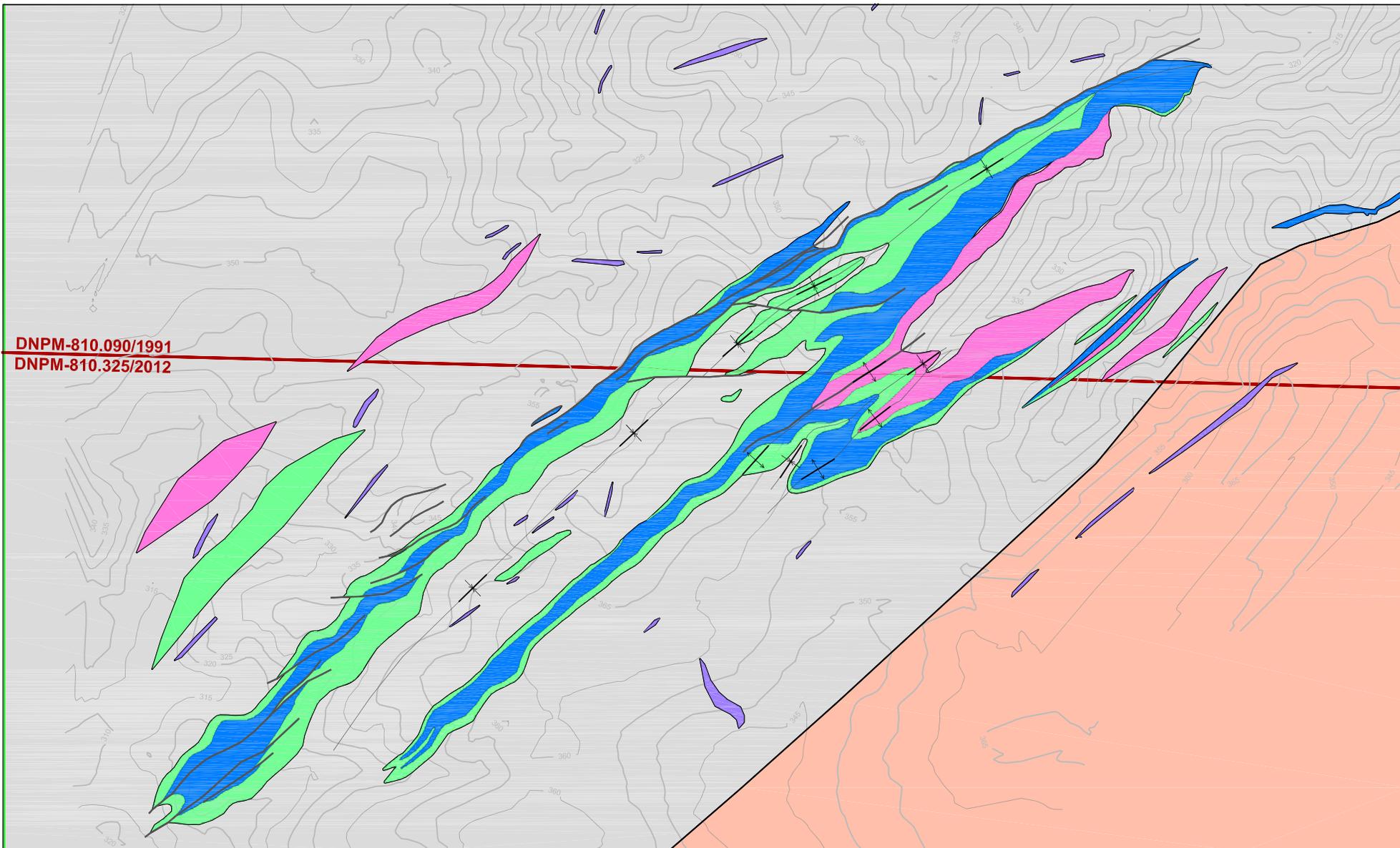
### 7.3 MINERALIZATION

Phosphate mineralization, occurring as the mineral apatite ( $\text{Ca}_5(\text{PO}_4)_3(\text{F},\text{Cl},\text{OH})$ ), is the primary mineralization of economic interest at Três Estradas. Apatite is the only phosphate-bearing mineral occurring in the carbonatite. Phosphate mineralization occurs in both fresh and weathered meta-carbonatite and amphibolite. It also occurs as secondary mineralization in the saprolite directly overlying the meta-carbonatite and amphibolite.

Apatite is a common accessory mineral in carbonatite and ultramafic igneous deposits. The apatite forms submillimeter-sized, subhedral to euhedral crystals that are disseminated throughout the groundmass. Apatite crystals are pale in color, requiring care when observing fresh, unaltered rock. In weathered rock, apatite is resistive to weathering relative to the carbonate matrix, making then easier to identify with a hand lens.

Calcite is the primary carbonate mineral at Três Estradas and accounts for approximately 60% of the mass of the carbonatite.

Carbonatites are typically complex, multi-phase intrusions with subsequent phases showing signs of fractionation. Apatite along with anatase and magnetite tends to be dominant in early phases of an intrusion while later phases of intrusion tend to be dominated by higher concentrations of niobium and rare-earth elements. Aguia geologists have noted up to three distinct phases within the cores of Três Estradas.



**Geological Units**

Quartz Vein

**Proterozoic**

Intermediate to Acid Gneiss

Granite

**Três Estradas Meta-carbonatite Complex**

Meta-syenite

Meta-carbonatite

Amphibolite

Faults and Fractures

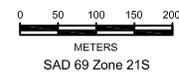
Fold Axis Trace

Anticline

Syncline

Exploration Permit Boundary

Topographic Contour



**FIGURE 7.2**

**Três Estradas Geology Map**  
**Aguia Resources Ltd.**  
**Três Estradas PEA**

DATE: 06/22/2016

By: \_\_\_\_\_

G:\Users\jw\Documents\Três Estradas\0002.g

000191944 - Agua PEA - 10/10/15 - 10/10/15 - 10/10/15

## 8 DEPOSIT TYPES

Phosphate is an important raw material that is used primarily for the production of fertilizers and for a variety of industrial applications. It occurs in both sedimentary and igneous deposits. In both types of deposits, the primary phosphate mineral is apatite. In igneous rocks, appreciable quantities are most commonly found in layered mafic intrusions and carbonatite complexes. Três Estradas is a carbonatite intrusion. Carbonatite melts contain at least 50% carbonate by volume, rich in calcium, magnesium, iron and/or sodium and form as a result of fractional crystallization from silicate and carbonate-rich source rocks and/or through carbon dioxide degassing in the presence of calcium and magnesium.

Carbonatite intrusions are often complex bodies formed from multiple intrusive phases, and are typically small in size, with dimensions ranging from 1.5 to 2 km (Biondi, 2003). Carbonatites are often associated with ultramafic complexes in cratonic regions. The magma uses deep fractures as a conduit for emplacement. In an alkaline-carbonatitic ultramafic complex the first products are alkaline-ultramafic rocks and the carbonatite rock corresponds to the final phase of magma crystallization.

Carbonatite intrusions typically fall into two morphological classes: (i) central or dome type intrusions and (ii) linear type intrusions. Central-type carbonatites typically form in regions of tectonic and magmatic reactivation in stable cratons or platform regimes. They tend to be shallow seated events with high energy and are often the final fractionate of a larger alkalic intrusion. Central-type carbonatites have occurred throughout geologic history. Linear-type carbonatites are predominantly Paleoproterozoic, preferential to deep faults and are typically not linked by magmatic differentiation to ultramafic rocks like central-type carbonatites.

Brazil hosts some of the best-known mineralized carbonatites in the world. Well known examples include Araxá - Minas Gerais, Catalão - Goiás, Cajati - São Paulo, and Tapira - Minas Gerais. All of these have an early Cretaceous to Eocene age range and are developed along the margins of the Parana Basin and can be classified as central-type carbonatites. Três Estradas is a linear-type carbonatite and is one of only two known linear-type carbonatite complexes known in Brazil.

The vast majority of Brazil's phosphate production is derived from the mining of carbonatite bodies and their near surface weathered products (Biondi, 2003).

## **9 EXPLORATION**

Agua has been diligent following a systematic approach in its exploration programs for Três Estradas.

### **9.1 GEOLOGICAL MAPPING**

The geological mapping of the three exploration permits was executed by Agua geologists on a scale of 1:10,000. Mapping was performed along north-south profiles at intervals of 100m. Within the area surrounding the meta-carbonatite, geologic mapping was completed at a scale of 1:1,000. Detailed mapping of the carbonatite complex was completed at a scale of 1:200.

### **9.2 TOPOGRAPHY**

In March 2012, Agua commissioned a detailed topographic survey of the meta-carbonatite area using differential GPS technology. The survey was carried out by Planageo – Serviços e Consultoria Ltda., from Caçapava do Sul, RS, Brazil. The survey comprised 35.35 line kilometers, consisting of survey lines spaced 25m apart and control lines spaced 100m apart. In addition, relief points between the lines, borehole collars, and auger borehole collars from the first exploration campaign were used to build the topography. The topographic survey generated contour lines at 1m intervals in the meta-carbonatite area. Contour lines at 5m intervals were obtained for the remaining area using shuttle radar topography mission (SRTM) and orthorectified Geoeye images with 0.5m resolution.

In December 2016, Agua completed an expanded detailed topographic survey of the area to cover an extended area beyond the main deposit. The air survey was carried out by SAI (Serviços Aéreos Industriais) or Industrial Air Services, using Lidar technology (light detection and ranging) including a new set of orthorectified images. The contour lines at 1m intervals were obtained in 1:2000 scale and the adopted flight level returned orthophotographic images at 1:5000 scale.

### **9.3 REMOTE SENSING**

Images from Landsat 7, sensor ETM+ and Geoeye-1 satellites were used to help in the geological interpretation and in the understanding of physiographic and infrastructure aspects.

#### **9.4 SOIL GEOCHEMISTRY**

Aguia in a partnership with CBC executed a soil sampling program in the northern portion of the meta-carbonatite exposure. The program covered a small area of the meta-carbonatite along the southern edge of DNPM #810.090/91 to complement the historical soil sampling completed by Santa Elina. Soil samples were collected every 25m along lines spaced 100m apart, for a total of 52 soil samples.

Results of both soil sampling programs were used to delimit  $P_2O_5$  anomalies in a northeast direction following the Cerro dos Cabritos Fault, to test for a continuation of the meta-carbonatite in that direction. Values higher than 1.42%  $P_2O_5$  were considered first order anomalies and values between 0.83% and 1.42%  $P_2O_5$ , were considered second order anomalies.

#### **9.5 ROCK GEOCHEMISTRY**

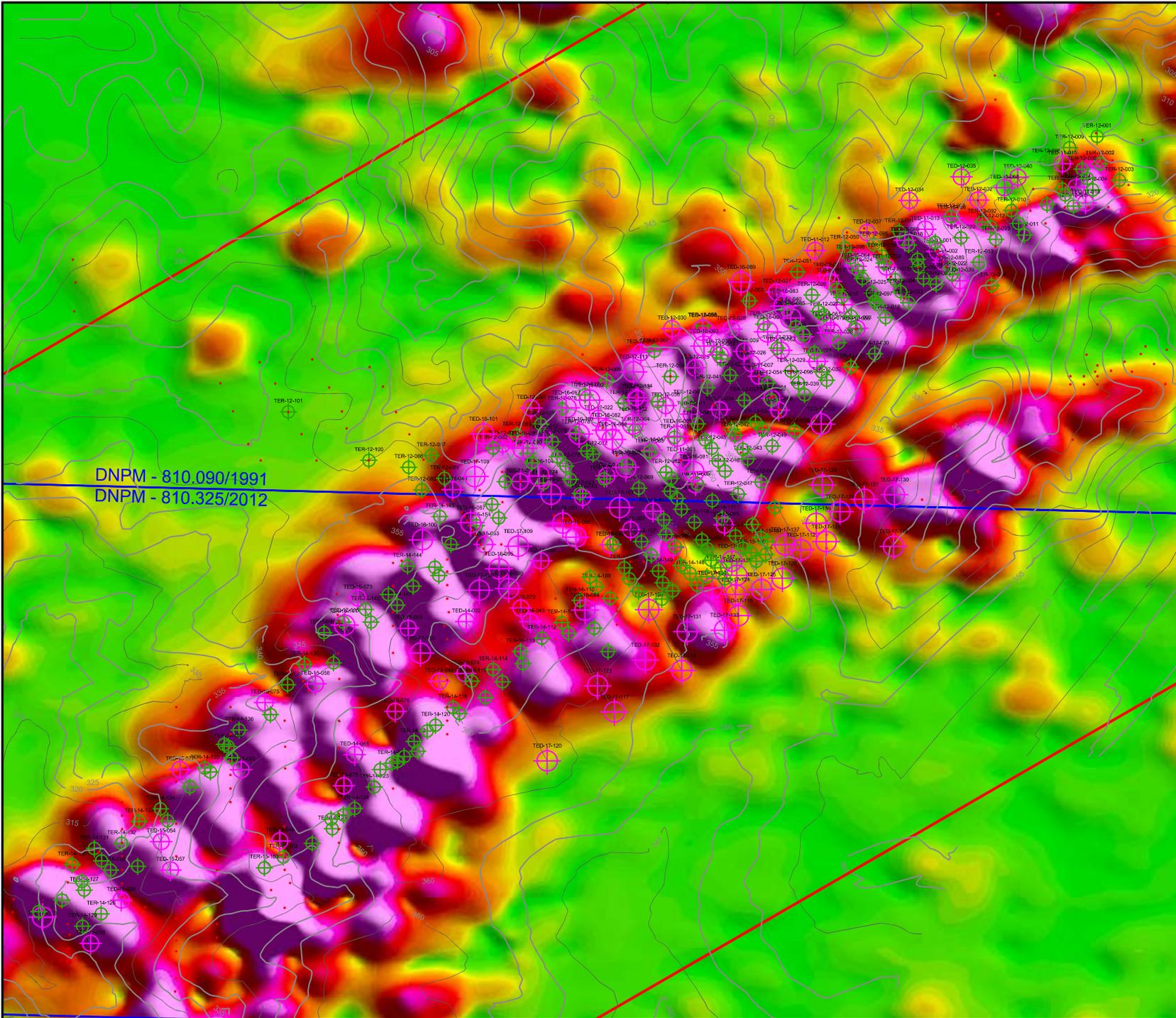
A total of 77 rock samples have been collected from within the project area. The majority of these samples represent meta-carbonatite. Assay results yielded up to 32%  $P_2O_5$  within the meta-carbonatite. Fresh or weathered carbonatite yielded mean values of 4% to 5%  $P_2O_5$ . Gneiss and meta-syenite rocks within the area did not return any significant  $P_2O_5$  grades. Few results are available from the amphibolite unit, as outcrops are scarce in the area.

#### **9.6 TRENCHING**

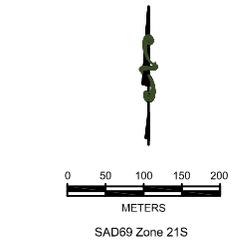
One historical trench exists on the tenement, cut perpendicular to the meta-carbonatite. According to Aguia, this trench was dug over 10 years ago by Santa Elina while prospecting for gold in the area. Within the trench Aguia sampled three vertical channels. Within each channel, two samples were collected from bottom to top. The  $P_2O_5$  results from these samples vary from 24.10% to 28.80%.

#### **9.7 GEOPHYSICAL SURVEYS**

Aguia made use of data from an airborne geophysical survey completed by CPRM, using rectified imagery for Total Magnetic Field (TMF), signal amplitude of TMF, First Derivative of the TMF, Uranium Concentration and Total Count of Gamma spectrometry. The magnetic anomalies identified in the airborne survey assisted in delineating areas of interest and led to Aguia completing a ground-based magnetic survey over the entire northern tenement area in March, 2012. The survey was carried out by AFC Geofísica, Ltda. from Porto Alegre, Brazil. The survey comprised 104 line kilometers oriented north-south. Survey lines and control lines were spaced at 25m and 100m apart respectively (Figure 9.1).



-  License Boundary
-  Model Area
-  Core Drillhole
-  RC Drillhole
-  Auger Drillhole
-  Drillhole Trace
-  Topography Contour



**FIGURE 9.1**

Agüia Resources Ltd.  
 Três Estradas Phosphate Project  
 Ground Magnetic Survey

## 10 DRILLING

Agua has completed five drilling campaigns on the Três Estradas area between 2011 and 2017. Drilling has included 139 core holes (20,509.5m), 244 reverse circulation (RC) holes (7,800.0m) and 487 auger holes (2,481.65m). Table 10.1 presents a summary of Agua's drilling activities at Três Estradas. A complete listing of drill holes is provided in Appendix B. Drill hole locations are shown in Figure 10.1. Figures 10.2 through 10.4 shows representative cross sections of the Três Estradas Deposit. It should be noted that only data from the core and RC drilling has been used in developing the resource model.

**Table 10.1 Summary of Drilling at Três Estradas**

Company	Drilling Campaign	Time Period	Type	No. of Holes	Total Length (m)
Agua Resources, Ltd.	1	Oct - Nov 2011	Core	19	1,317.15
			Auger	26	169.90
	2	Jul - Oct 2012	Core	21	4,016.75
			Auger	158	994.65
			RC	105	2,151.00
	3	Nov 2014 - Jan 2015	Core	20	3,272.90
			RC	49	1,153.00
			Auger	203	818.70
	4	Oct - Dec 2015	Core	18	2,194.65
			Auger	100	498.40
	5	Nov 2016 – Jun 2017	Core	61	9,708.05
			RC	90	4,496.00
<b>Total</b>				<b>719</b>	<b>30,791.15</b>

### 10.1 DRILLING METHODS

Agua used REDE Engenharia e Sondagens S.A. (REDE) to complete all core drilling in the five drilling campaigns at Três Estradas. Auger drilling was completed by Agua personnel and RC drilling was undertaken by Geosedna Perfurações Especiais S.A. (Geosedna). All drill collars are surveyed using differential GPS both before and after drill hole completion. Coordinates are recorded in Universal Transverse Mercator (UTM) using the SAD69 Datum, Zone 21S.

Following completion of a drill hole, collar locations are marked by concrete markers with an embedded plastic collar pipe and an aluminum tag identifying drill hole ID, UTM coordinates, azimuth, dip, and penetration depth. All core and RC drill collars are marked by concrete markers as shown in Figure 10.2.

### **Exploration Core Drilling**

All core holes were drilled using wireline coring methods. HQ size (63.5mm diameter core) core tools were used for drilling through weathered material and NQ size (47.6mm diameter core) tools were used for drilling through fresh rock. Core recovery has exceeded 90% in 97% of all core holes.

All but 10 of the core holes (129) have been drilled as angle holes with dip angles ranging from  $-45^{\circ}$  to  $-75^{\circ}$ , with the majority drilled at  $-60^{\circ}$ . Two principal orientations have been used in core drilling. Ninety-six (96) of the core holes have an azimuth bearing of  $150^{\circ}$ , with the remaining 33 angle holes having an azimuth of  $330^{\circ}$ . Beginning in the second drilling campaign at Três Estradas, down hole surveys were completed on core holes using a Maxibore II down-hole survey tool. Readings are collected on three-meter intervals. A total of 96 core holes have received down-hole surveys at Três Estradas.

### **RC Drilling**

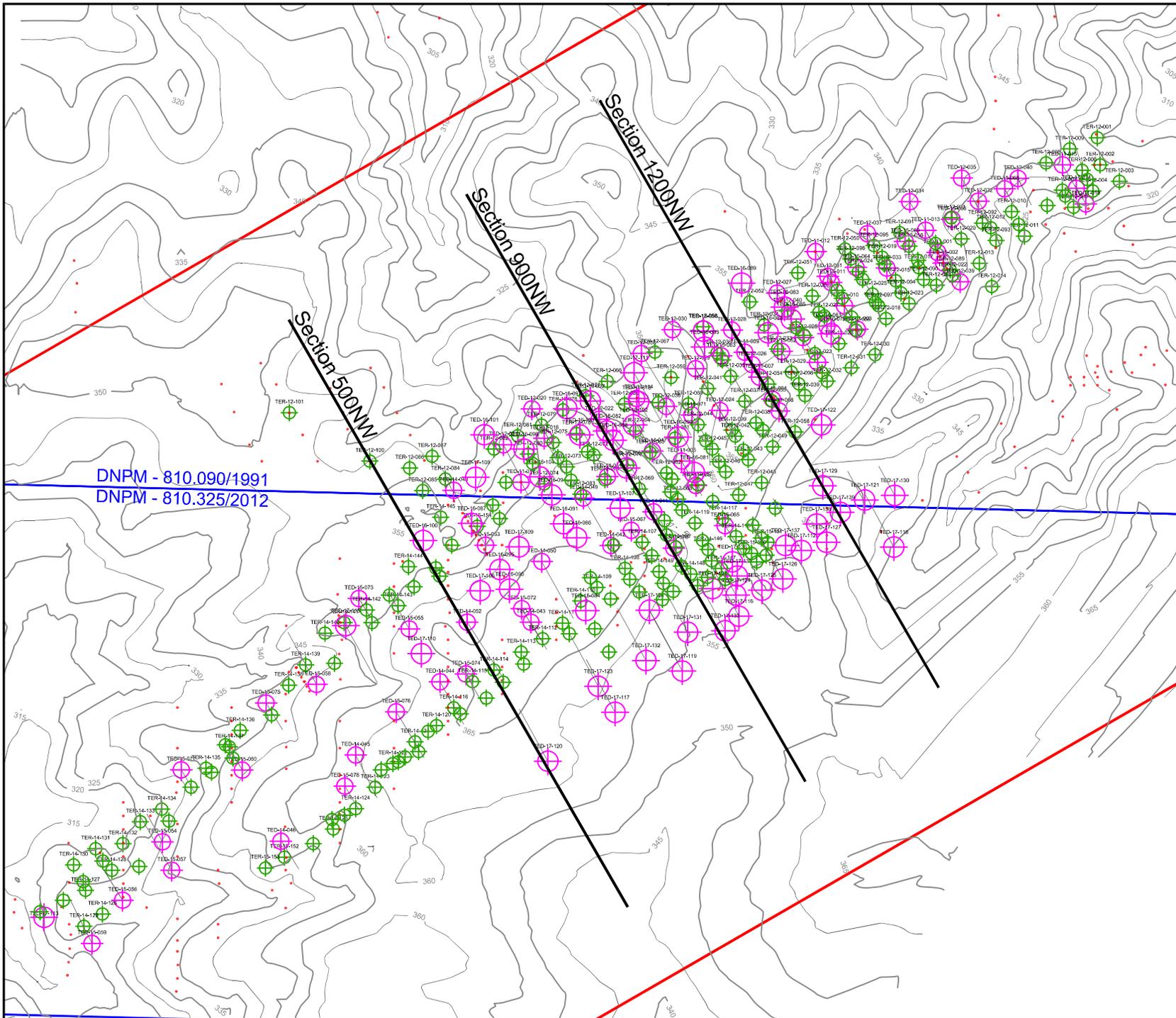
RC drilling was used to complete 244 holes with a cumulative length of 7,800.0m. All RC holes were drilled vertically ( $-90^{\circ}$ ) using 140mm button hammer bit. Holes were primarily drilled dry.

### **Auger Drilling**

Auger drilling was completed by Aguia personnel testing the extents of mineralization in the overlying saprolites. Auger holes were drilled to a maximum depth of 15m. Two tipper scarifier motorized augers were used to drill the auger holes.

## **10.2 COMMENTS ON DRILLING**

Aguia has followed standard practices in their core, RC, and auger drilling programs. They have followed a set of standard procedures in collecting cuttings and core samples, logging, and data acquisition for the project. Their procedures are well documented and meet generally recognized industry standards and practices. Millcreek considers the exploration data collected by Aguia to be of sufficient quality to support mineral resource evaluation.



- License Boundary
- Model Area
- ⊗ Core Drillhole
- ⊗ RC Drillhole
- Auger Drillhole
- Drillhole Trace
- ~ Topography Contour

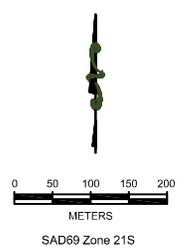
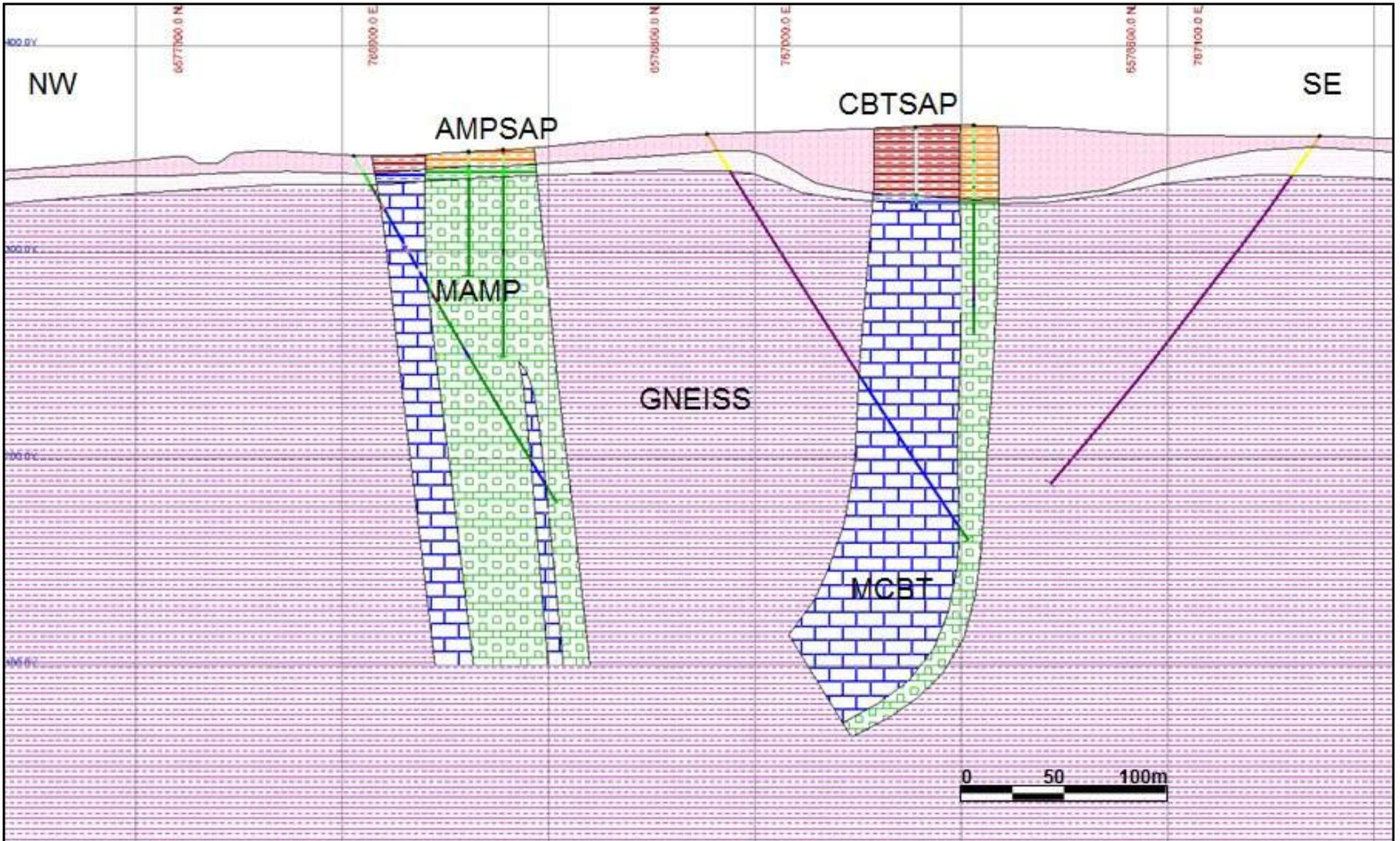
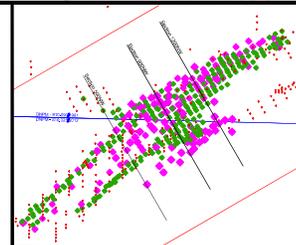


Figure 10.1

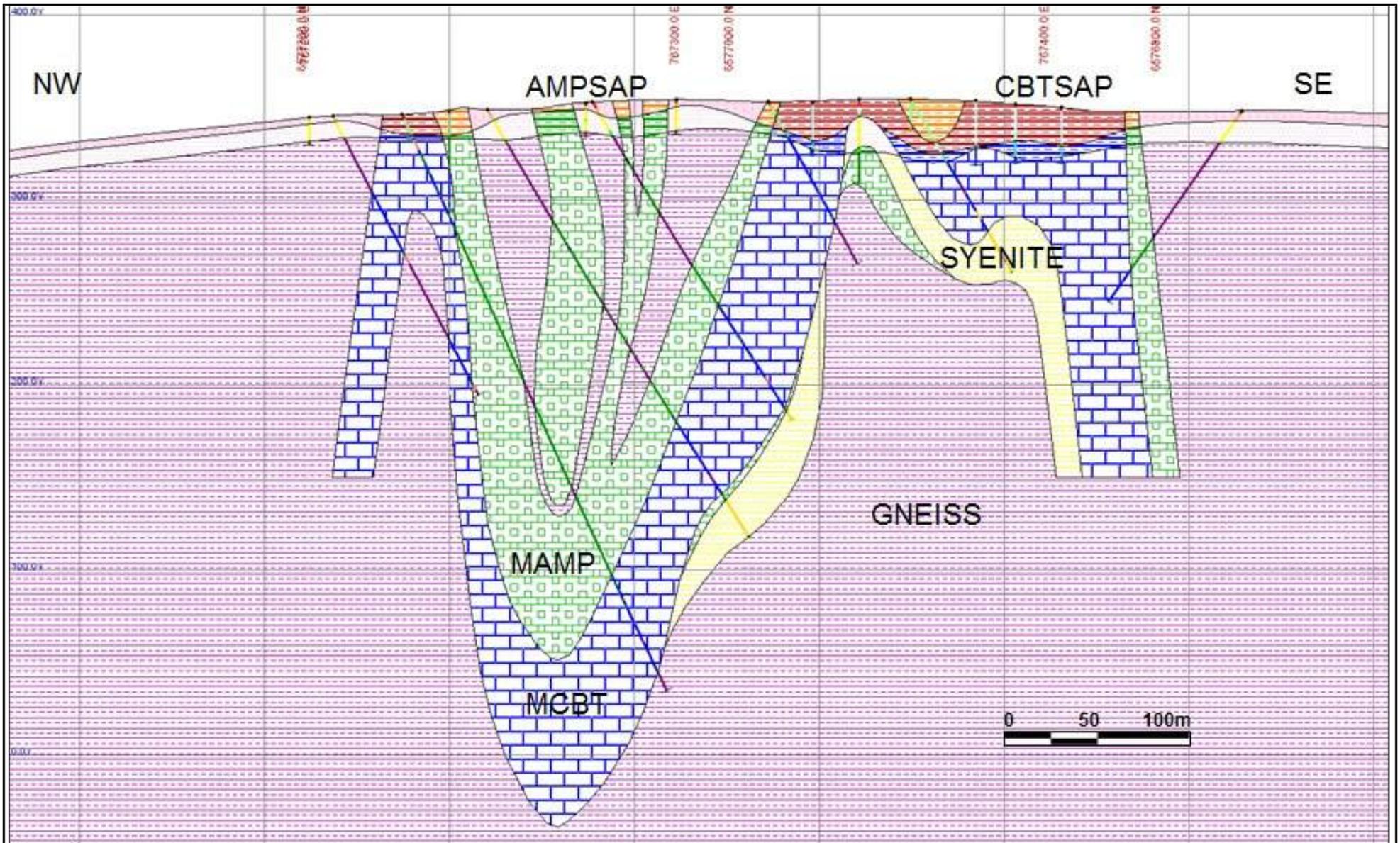
Agua Resources Ltd.  
Trés Estradas Phosphate Project  
Drill Hole Location Map



- |  |   |
|--|---|
|  AMSAP - Saprolite of Amphibolite       |  MAMP - Amphibolite |
|  CBTSAP - Saprolite of Meta-Carbonatite |  Syenite            |
|  WMCBT - Weathered Carbonatite          |  Gneiss             |
|  MCBT - Meta-Carbonatite                |   |



**FIGURE 10.2**  
 Três Estradas Phosphate Project  
 Agüa Resources Ltd.  
 Section 500NW  
 DATE: 09/08/2017  
 BY: *[Signature]*  
 Millcreek Mining GROUP



- |  |   |
|--|---|
|  AMSAP - Saprolite of Amphibolite       |  MAMP - Amphibolite |
|  CBTSAP - Saprolite of Meta-Carbonatite |  Syenite            |
|  WMCBT - Weathered Carbonatite          |  Gneiss             |
|  MCBT - Meta-Carbonatite                |   |

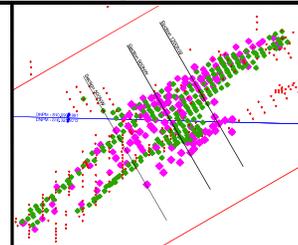


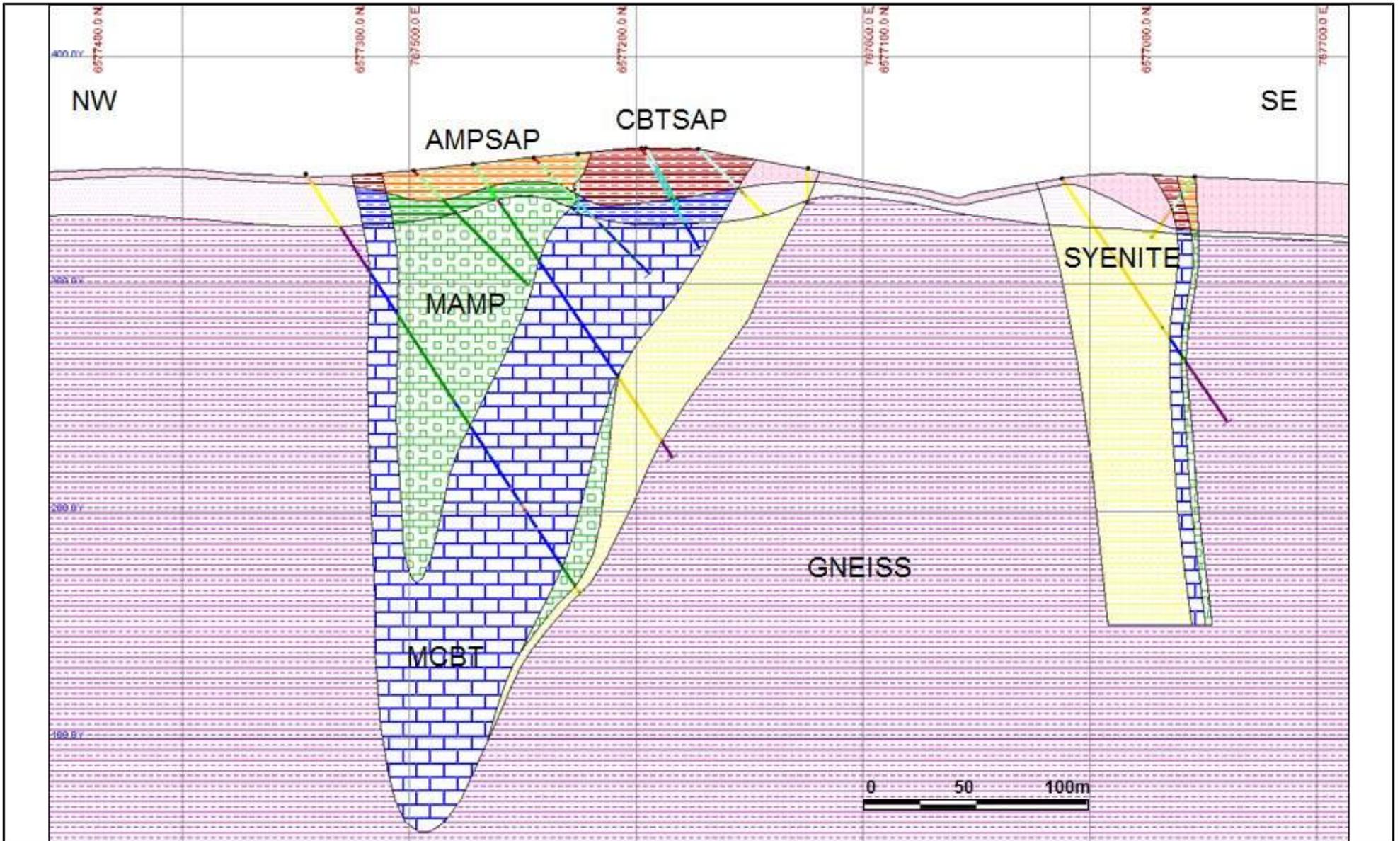
FIGURE 10.3

Três Estradas Phosphate Project  
 Agua Resources Ltd.  
 Section 900NW

DATE: 09/08/2017

BY: *Steven G. Harris*

Millcreek Mining GROUP



- |  |   |
|--|---|
|  AMSAP - Saprolite of Amphibolite       |  MAMP - Amphibolite |
|  CBTSAP - Saprolite of Meta-Carbonatite |  Syenite            |
|  WMCBT - Weathered Carbonatite          |  Gneiss             |
|  MCBT - Meta-Carbonatite                |   |

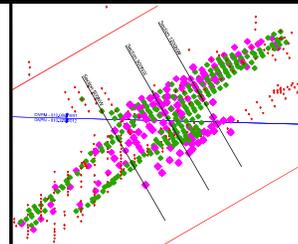


FIGURE 10.4

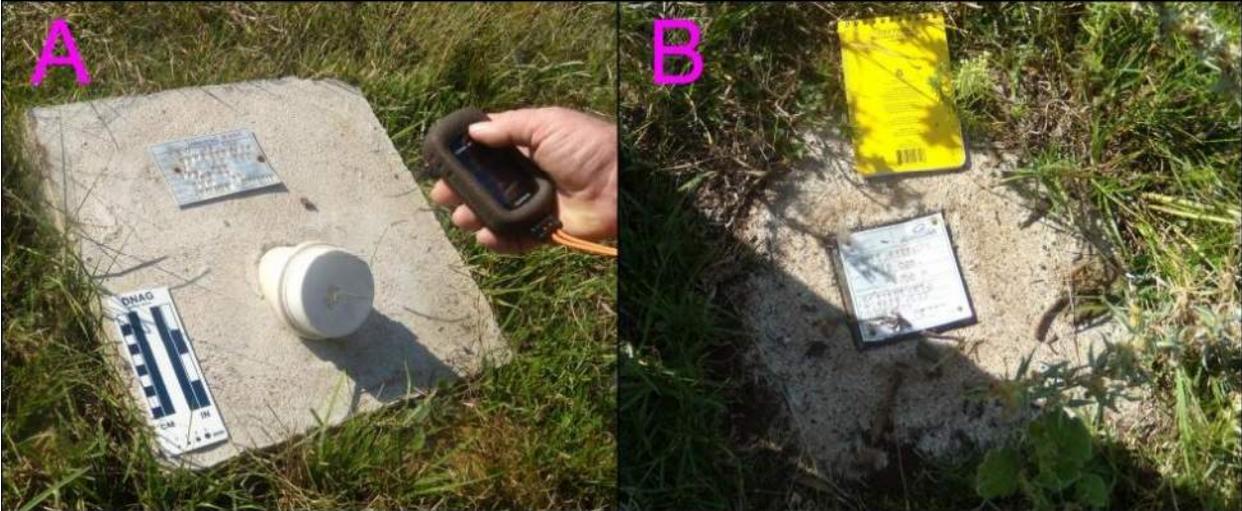
Três Estradas Phosphate Project  
 Agua Resources Ltd.  
 Section 1200NW

DATE: 09/08/2017

BY: *Steven G. Perry*

Millcreek Mining GROUP

Figure 10.5 Concrete Markers Used to Identify Drill Hole Collars: A) Core Hole marker; B) RC Hole marker



## 11 SAMPLE PREPARATION, ANALYSES AND SECURITY

Agua has followed standard practices in their geochemical surveys, core, RC and auger drilling programs. They have followed a set of standard procedures in collecting cuttings and core samples, logging and data acquisition for the project. Their procedures are well documented and meet generally recognized industry standards and practices. Millcreek considers the exploration data collected by Agua to be of sufficient quality to support mineral resource evaluation.

### 11.1 SAMPLING METHOD AND APPROACH

All core and drilling samples are transported from the project sites to Agua's sample storage and preparation facility in Lavras do Sul.

#### Core Drilling

All core logging is completed by Agua geologists and directly entered into a comprehensive database program. Agua's geologists are responsible for identifying and marking core intervals for sampling. Sample intervals range in length from 0.15m to 6.20m with 90% of all core samples falling within the range of 0.8m to 1.2m. Agua's procedures for the sampling of core drill holes were as follows:

- The driller and/or driller's helper removes the core from the core barrel and places the core in the core tray;
- Core depths, core cut and recovery measurements are confirmed;
- Core is gently washed and rinsed of drilling muds and fluids with clean water;
- Core is then transferred to standard wooden core boxes;
- Core boxes are labeled with a metal tag denoting hole ID, box number, and depth intervals. Depth markers are inserted in the core boxes marking the depths at the start and end of each core run.
- Core is transferred at routine intervals by Agua personnel from the drill site to the sample storage and preparation facility in Lavras do Sul.
- One sampling card is completed for each sample. The sampling cards have two detachable tags that are used further in the sampling process. One tag is inserted into the core box in the interval that has been sampled and the second tag is inserted into the sample bag together with the sample.

- Each sample is assigned a unique sample number that allows it to be traced through the sampling and analytical procedures and for validation against the original sample site.
- Three readings per meter are performed with a portable x-ray fluorescence (XRF) analyzer. Each set of readings is averaged to produce a semi-quantitative  $P_2O_5$  log. This log is referenced to ensure the proper insertion of control samples. This procedure was used during the first drilling campaign at Três Estradas and from the beginning of the second drilling campaign until the drilling of Borehole TED-12-027. Portable XRF was used as a semi-quantitative tool for screening samples. Portable XRF readings are not used in resource estimation. This procedure was abandoned with subsequent holes at Três Estradas.
- A photographic record is maintained of all core boxes with each photograph recording three boxes;
- Detailed geological logs are completed for every core hole using an appropriate logging form. Sampling intervals in the amphibolite and the carbonatite are typically targeted for a 1.0m length but may fall within a range of 0.50m to 1.50m. Samples in the unmineralized gneiss host rock may have considerably longer lengths of up to 6.2m.
- For the weathered material, a spatula or a machete is used to split the sample into two subsamples along the core axis;
- Fresh core is split lengthwise using a core saw;
- Samples are systematically taken using the right half of the core, returning the left half of the core to the core box for archival storage. One paper tag with the sample number is inserted into the core box with the remaining left half-core to register the sampling interval.
- Samples are then packed in plastic bags and a second paper tag with the sample number is inserted into the bag for identification;
- Blanks and standards are inserted systematically;
- A geologist determines the number of standards and blanks to be sent to the laboratories by reviewing the sampling cards and sample bags;
- Archived core is stored in Aguia's facility in Lavras do Sul. All sample pulps and rejects returned from the laboratory are subsequently returned for storage in Lavras do Sul.

- Digital and hard copies of all sampling and shipment documentation are stored in the project office at Lavras do Sul. Documentation includes: geological logs, core photographs, core recovery records, portable XRF readings and down-hole surveys.

## **RC Drilling**

The sampling procedures for RC drilling are as follows:

- The sequential distribution of samples, as well as the sampled interval, are checked;
- Moist samples are split using a plastic liner and a metal cross-blade device. Saturated samples are dried before being homogenized.
- Dry samples are split using a Jones riffle splitter;
- Every metre drilled produces two aliquots with a minimum weight of 500g and a maximum of 2kg. The two aliquots are identified as “archive” and “analysis”; and
- The “archive” samples are identified by hole ID and the sampling interval. The “analysis” samples are identified by hole ID, sample interval and an assigned sample number.

## **Auger Drilling**

Auger sampling procedures are as follows:

- The first 20 centimeters of cuttings is discarded;
- Samples are taken at 1m increments;
- Sample cuttings are transferred from the auger to a plastic box and then to a large plastic sheet;
- On the plastic sheet any large pieces of sample material are manually broken apart;
- Two technicians then shake the contents onto the plastic sheet in a rolling motion to homogenize and blend the sample cuttings;
- After homogenizing the cuttings, approximately 2kg of sample material is collected from the sample mound and labeled with auger borehole ID and depth interval;
- Throughout the drilling, a representative piece of rock is collected and stored at 1m intervals. These samples are analyzed for phosphorus, calcium and aluminum content using a portable XRF analyzer. For every 30 readings, two standard certified materials (samples GRE-03, GRE-04) and a blank certified material are analyzed.

During each stage of the field sample preparation, a small sample is taken and archived in a purpose-built box for geological logging and for later reference;

- The portable XRF is used to screen samples for further testing at the analytical laboratory. Portable XRF is not a substitute to analytical testing performed at the commercial laboratory. Samples yielding greater than 1.31% phosphorus (equivalent to 3% P<sub>2</sub>O<sub>5</sub>) are forwarded on to the analytical laboratory. Samples yielding less than 1.31% Phosphorous are placed in storage.
- Certified reference samples are inserted with every 20 samples followed by a fine and coarse blank sample. Blanks were also inserted at the end of mineralized intervals;
- A batch of samples for shipment can contain samples from more than one auger borehole. However, all samples from an individual auger borehole are shipped within the same batch to the laboratory; and
- Samples are shipped to the ALS or SGS laboratories, in Vespasiano, MG, Brazil in plastic bags and are labeled with the sample identification along with another label provided in a small plastic bag.

### **Sample Dispatch**

Samples from drilling were transported from Lavras do Sul to Bage, RS by Aguia personnel using Aguia vehicles. From Bage, samples were transported by a commercial carrier, TNT Mercurio, to Belo Horizonte, MG. In Belo Horizonte, a dispatcher was responsible for transporting samples to the appropriate testing facility.

## **11.2 SAMPLING ANALYSES**

From the start of exploration activities up through October, 2012, ALS Laboratory in Vespasiano, MG was the primary facility used for the analysis of soil, rock and drilling samples. After October, 2012, all subsequent samples from Três Estradas were sent to SGS Geosol, also in Vespasiano, as the primary analytical laboratory.

The ALS laboratory in Vespasiano is primarily an intake and preparation facility. Samples are crushed and pulverized into rejects and pulps and entered into the ALS tracking system before being forwarded to ALS Peru S.A. in Lima or ALS Minerals in North Vancouver, Canada. The Vespasiano facility is not specifically accredited but operates as part of the ALS Group whose management system is consistent with ISO 9001:2008 requirements. Both the Lima and North Vancouver facilities have ISO/IEC17025:2005

accreditation through the Standards Council of Canada. ALS is not specifically accredited for the methods used to analyze the samples submitted by Aguia. The ALS laboratories used by Aguia are commercial fee-for-service testing facilities and are independent of Aguia.

The SGS Geosol laboratory is a full analytical facility. SGS Geosol is an internationally recognized mineral testing laboratory. Its management system is accredited to ISO 9001:2008 by ABS Quality Evaluation Inc., Texas, USA. SGS Geosol is not specifically accredited for the methods used to analyze the samples submitted by Aguia. The SGS Geosol laboratory is a commercial fee-for-service testing facility and is independent of Aguia.

Aguia used blanks in the first drilling campaign that were prepared by Acme Analítica Laboratórios, Ltda in Aparecida de Goiânia, Goiás, Brazil and analyzed and certified by Acme Analytical Laboratories S.A, in Santiago, Chile. Mechanical preparation of mineral samples in Aparecida de Goiania operates as part of a management system that fulfills the requirements of ISO 9001:2008. Acme Santiago is accredited under ISO/IEC 17025:2005 by the Standards Council of Canada (accredited laboratory no. 764). Acme is not accredited for the specific methods used to analyze the samples submitted by Aguia.

Aguia also commissioned two laboratories at the University of São Paulo (Technological Characterization Laboratory and Ore Treatment Research Group) to carry out a mineralogical characterization study and a beneficiation study. Though both labs are highly reputable research facilities, they have not undergone any accreditation programs common with commercial laboratories. At the University of São Paulo, the mineralogical analysis included scanning electron microscope (SEM) with an energy dispersive spectrometer (EDS) and employed a mineral liberation analysis (MLA) routine.

Beneficiation studies were performed first at the University of São Paulo (USP). Studies were also performed at SGS Lakefield, Canada that basically reproduced the USP results with slight improvements. SGS Lakefield is a recognized facility, meeting ISO/IEC 17025 standards for 67 specific registered tests for the minerals industry, including flotation tests performed for Aguia. Finally, we have recent beneficiation work from Eriez USA that are of outstanding quality. Beneficiation testing completed by USP, SGS Lakefield, and Eriez USA were completed on a commercial, fee-for-service basis.

## **Soil Samples**

Soil samples were collected from the B Horizon of the soil profile. Sample locations were excavated completely to the base of the B Horizon before collecting a representative 2kg sample. Both ALS and SGS were used for soil geochemistry. Since Três Estradas started out as a gold exploration play, samples were analyzed for gold using fire assay with an atomic absorption finish and a 31 element analytical package using inductively coupled plasma (ICP) spectrometry. Soil samples were sent for analysis to SGS Geosol in Belo Horizonte. Samples of 50 grams passing 80 mesh were analyzed for gold using fire assay with an atomic absorption finish and for a suite of 31 elements using ICP.

## **Rock Samples**

Rock samples were collected in order to represent every distinct lithology outcropping over the entire project area. All samples were screened using a portable XRF unit. Samples yielding more than 3% P<sub>2</sub>O<sub>5</sub> were shipped to the laboratories (ALS and/or SGS Geosol) for preparation and laboratory analysis. Samples were weighed and dried to a maximum of 120°C and crushed to 70% passing through a 2mm screen. A 250g split was then pulverized to 85% percent passing 75µm to produce the analytical pulp. Samples underwent two analytical procedures. XRF was used to determine major oxides: Al<sub>2</sub>O<sub>3</sub>, CaO, Fe<sub>2</sub>O<sub>3</sub>, K<sub>2</sub>O, MgO, MnO<sub>2</sub>, Na<sub>2</sub>O, P<sub>2</sub>O<sub>5</sub>, SiO<sub>2</sub>, and TiO<sub>2</sub>. XRF uses a sample fused with lithium metaborate. The loss on ignition (LOI) from the analysis is calculated from the difference in weight of a 1.0g sample prior and after placing the sample in an oven at 1,000 °C for one hour, then allowing the sample to cool. Samples were also analyzed for a suite of 31 minor, trace and rare-earth elements using an aqua regia digestion and ICP - Mass Spectrometry.

## **Auger, Core and Reverse Circulation Samples**

XRF analysis has been used to determine major oxide amounts on all auger, core and RC samples following the same procedures outlined above for rock samples. Sample pulps are fused with lithium metaborate and analyzed by XRF for Al<sub>2</sub>O<sub>3</sub>, CaO, Fe<sub>2</sub>O<sub>3</sub>, K<sub>2</sub>O, MgO, MnO<sub>2</sub>, Na<sub>2</sub>O, P<sub>2</sub>O<sub>5</sub>, SiO<sub>2</sub>, and TiO<sub>2</sub>. All oxides are reported in weight percent. In addition, samples from the first campaign of drilling at Três Estradas were also subjected to the 31 element ICP analysis.

## **Specific Gravity Measurements**

During the first drilling campaign in 2011, the specific gravity of 48 core samples were measured by SGS Geosol using a standard weight in water and weight in air methodology. Uncut core segments of approximately 15 to 20 centimeter lengths were wrapped in PVC film and submerged in water. Aguia took over this testing with all subsequent drilling following the same procedures used by SGS Geosol. To date, 4,216 specific gravity measurements have been determined for Três Estradas.

## **12 DATA VERIFICATION**

The QPs completed a site visit to the Três Estradas project site on March 17, 18 and 19, 2016. The site visit confirmed the location and access routes of previous and current exploration activities. The QPs were able to visit outcrops hosting phosphate mineralization, view exposures of surrounding country rock, as well as visiting numerous drill sites at both project areas. During the site visits, photographs and GPS coordinates were taken at drill sites and outcrops that were later compared to coordinates in the drilling databases and maps provided by Aguia. The QPs also spent time at Aguia's core storage and logging facility in Lavras do Sul where they were able to examine drill core, review procedures used in logging, archiving information, density measurements and sample preparation.

A second site visit was made to the property by the Geology QP on March 8 and 9, 2017. The purpose of this site visit was to review the outcome of the delineation drilling carried out during the previous few months and to observe first-hand the drilling currently underway to test mineralization in the new zone located along the southeast side of the main deposit. The QP was able to observe drilling that was underway by two core rigs on the new zone as well as drilling that was ongoing for geotechnical/hydrological characterization and comminution sampling. In total, there were four core rigs operating at the time of the site visit.

During the second site visit, the Geology QP reviewed core and working cross-sections of the recent delineation drilling and from core from recently completed holes in the new zone. During the site visit, the QP selected a list of 85 coarse reject samples to be used as an independent confirmation program.

### **12.1 VERIFICATION OF CORE LOGS**

During our first site visit, Millcreek submitted a list of randomly selected core holes for Aguia to retrieve from storage for Millcreek to examine in detail. Table 12.1 provides a listing of core holes examined by Millcreek. The core storage and logging facility has a large viewing area outdoors but is under cover for viewing the core, which allowed the QPs to lay out the core boxes for up to four complete core holes at a time for examination. The cores were directly compared to the original logs prepared by Aguia geologists to verify intervals and measurements, lithologic, and alteration descriptions. Our detailed review of the cores with logging records found no discrepancies. The logs Millcreek reviewed with the cores show a good level of detail in the descriptions and

consistency in nomenclature and terminology. During the second site visit, an additional 11 core holes that were part of the recent delineation drilling campaign and drilling on the new zone were examined.

**Table 12.1 Selected Core Holes for Detailed Examination**

2016 Site Visit	2017 Site Visit
TED-11-001	TED-16-091
TED-11-002	TED-16-095
TED-11-004	TED-17-109
TED-11-006	TED-17-112
TED-11-008	TED-17-116
TED-12-024	TED-17-117
TED-14-043	TED-17-118
TED-15-065	TED-17-119
TED-15-067	TED-17-120
	TED-17-121
	TED-17-122

## 12.2 DATABASE VERIFICATION

Millcreek completed a series of routine verifications to ensure reliability of the compiled databases provided by Aguia. This work included checking the compiled databases with assay certificates for both core and RC drill holes. Twenty-four (24) core holes and 36 RC were reviewed against the assay certificates. More than 15% of the drill holes and 15% of the assays were audited against the laboratory assay certificates. Table 12.2 identifies the drill holes audited against assay certificates.

**Table 12.2 Database Verification Holes**

Core Holes		RC Holes		
TED-11-007	TEC-15-071	TER-12-013	TER-12-078	TER-16-162
TED-11-015	TED-15-076	TER-12-020	TER-12-088	TER-16-169
TED-11-019	TED-16-083	TER-12-024	TER-12-090	TER-16-176
TED-12-025	TED-16-084	TER-12-026	TER-12-095	TER-16-184
TED-12-029	TED-16-092	TER-12-031	TER-14-106	TER-16-191
TED-12-033	TED-16-102	TER-12-034	TER-14-117	TER-17-199
TED-14-043	TED-17-107	TER-12-037	TER-14-130	TER-17-207
TED-14-050	TED-17-111	TER-12-045	TER-14-136	TER-17-213
TED-15-054	TED-17-116	TER-12-059	TER-14-145	TER-17-222
TED-15-055	TED-17-122	TER-12-062	TER-15-150	TER-17-230
TED-15-061	TED-17-132	TER-12-064	TER-15-153	TER-17-237
TED-15-068	TED-17-137	TER-12-074	TER-16-155	TER-17-242

### 12.3 QUALITY ASSURANCE / QUALITY CONTROL (QA / QC)

For quality assurance and quality control of analyses, Aguia uses a combination of reference samples, blanks, duplicate samples and umpire check assays. Aguia follows a protocol for accepting/refusing each batch of assays returned from the analytical laboratory:

- If a reference sample fails between two and three standard deviations and no other failure occurs in the batch, the batch is accepted;
- If a reference sample fails beyond three standard deviations the reference sample is classified as a failure;
- If two or more reference samples fail between two and three standard deviations in a batch, the batch is deemed a failure;
- If both blank samples (coarse and fine) fall over the warning line, the batch is classified as a failure until the next blank sample sequence;
- If a duplicate sample exceeds 5% difference over the mean of the original and duplicate sample and no other failure occurs with other duplicates samples in the batch, then the batch is accepted.

Reference, blanks and duplicate samples were inserted into the stream of drill samples such that one in 20 samples was a reference sample, one in every 30 samples was a blank sample, and one in every 30 samples was a duplicate sample. Care has been taken in the sequencing to distribute references and blanks so that reference and blanks didn't immediately follow each other, though a coarse-grained blank does immediately precede a fine-grained blank to track carryover contamination. Tables 12.3 and 12.4 summarize the samples used to evaluate QA/QC of the drilling samples.

**Table 12.3 Summary of Quality Control Samples for Três Estradas**

Type		Core	%	RC	%	Total	%
<b>Sample Assays</b>		16,046	67.29	7,800	32.71	23,846	100.00
<b>Reference Samples</b>	<b>GRE-3</b>	15	0.06	104	0.44	119	0.50
	<b>GRE-4</b>	182	0.76	0	0.00	182	0.76
	<b>ITAK-910</b>	561	2.35	192	0.81	753	3.16
	<b>ITAK-911</b>	57	0.24	102	0.43	159	0.67
<b>Blanks</b>	<b>Fine</b>	466	1.95	237	0.99	703	2.95
	<b>Coarse</b>	470	1.97	237	0.99	707	2.96
<b>Check Assays</b>		478	2.00	301	1.26	779	3.27
<b>Duplicates</b>		733	3.07	412	1.73	1,145	4.80
<b>Total QA/QC Samples</b>						<b>4,547</b>	<b>19.07</b>

### Reference Samples

During the first two drilling campaigns at Três Estradas, Agüia used two certified control samples, GRE-3 and GRE-4, prepared by Geostats Pty. The reference samples were certified for phosphorous and several trace elements (P reported in ppm and converted to wt.% P<sub>2</sub>O<sub>5</sub> by Agüia). The control samples are not certified for the other five oxides considered in the resource evaluation. ALS delivered consistent P<sub>2</sub>O<sub>5</sub> results, mostly within two standard deviations and always within three standard deviations. With all subsequent drilling at Três Estradas, Agüia had two samples prepared by Instituto de Tecnologia August Kekulé (ITAK) to be used as certified reference samples. Both samples were prepared from carbonatite material sourced from Três Estradas. Reference samples were inserted at regular intervals with each batch of samples sent to the laboratory. Table 12.5 summarizes the characteristics and analytical results for the reference samples utilized with the drilling at Três Estradas.

**Table 12.4 Três Estradas Reference Samples**

Reference Sample	GRE-3	GRE-4	ITAK-910						ITAK-911					
	P <sub>2</sub> O <sub>5</sub>	P <sub>2</sub> O <sub>5</sub>	P <sub>2</sub> O <sub>5</sub>	CaO	SiO <sub>2</sub>	MgO	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	P <sub>2</sub> O <sub>5</sub>	CaO	SiO <sub>2</sub>	MgO	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>
<b>Certified Value</b>	15.23	6.19	4.42	39.70	7.71	6.10	1.27	6.92	11.06	18.52	26.64	5.67	5.40	19.44
<b>Standard Deviation</b>	0.08	0.03	0.10	0.67	0.08	0.10	0.05	0.12	0.18	0.28	0.21	0.10	0.20	0.13
<b>Estimated Uncertainty</b>	0.22	0.10	0.21	1.40	0.17	0.20	0.10	0.24	0.37	0.57	0.43	0.20	0.41	0.27
<b>Sample Count</b>	119	182	753	753	753	753	753	753	159	159	159	159	159	159
<b>Average Value</b>	15.02	6.09	4.40	39.89	7.63	6.07	1.24	6.96	10.86	18.44	26.35	5.59	5.23	19.36
<b>Minimum</b>	14.70	5.95	4.18	38.30	7.32	5.72	1.16	6.62	10.51	17.80	25.60	5.40	5.04	18.80
<b>Maximum</b>	15.55	6.45	4.57	42.30	8.11	6.50	1.62	7.43	11.13	18.80	26.90	5.82	5.46	20.10
<b>Standard Deviation</b>	0.16	0.08	0.63	0.42	0.09	0.11	0.34	0.11	0.11	0.16	0.24	0.09	0.06	0.28

### Blank Samples

Blank samples are used to monitor physical contamination during sample preparation. A coarse-grained blank was created using locally-sourced quartz. The coarse-grained blank is used to track possible carryover contamination of samples through crushing and pulverizing of samples. The fine-grained blank is used to monitor and track any other signs of physical contamination that may affect analytical results. Table 12.5 summarizes the characteristics and analytical results for the two blank samples.

**Table 12.5 Blank Sample Characteristics**

Sample	Parameter	P <sub>2</sub> O <sub>5</sub> %	CaO%	SiO <sub>2</sub> %	MgO%	Al <sub>2</sub> O <sub>3</sub> %	Fe <sub>2</sub> O <sub>3</sub> %
<b>Coarse Blank</b>	Average Value	0.012	0.022	98.000	<0.1	<0.1	0.642
	Detection Limit	0.010	0.010	0.100	0.100	0.100	0.010
	Upper Warning Limit (Avg + 5X Detection Limit)	0.062	0.072	98.500	0.500	0.500	0.692
	Lower Warning Limit - SiO <sub>2</sub> (Avg-2X Detection Limit)			97.800			
<b>Fine Blank</b>	Average Value	0.012	0.022	98.000	<0.1	<0.1	0.642
	Detection Limit	0.010	0.010	0.100	0.100	0.100	0.010
	Upper Warning Limit (Avg + 3X Detection Limit)	0.042	0.052	98.300	0.300	0.300	0.672
	Lower Warning Limit - SiO <sub>2</sub> (Avg - 2X Detection Limit)			97.800			

Blank samples were analyzed for six oxides utilized by Aguia to evaluate the mineral resource (P<sub>2</sub>O<sub>5</sub>, CaO, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, MgO, and SiO<sub>2</sub>). The most relevant of these oxides (P<sub>2</sub>O<sub>5</sub>) typically yielded values below the 0.062% upper warning limit for coarse blanks and is always below the 0.04% upper warning limit for fine blanks. Four of the remaining oxides, CaO, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, MgO, commonly yielded values over the upper warning limits on coarse blanks and occasionally with the fine blanks. Coarse blanks yielded considerably more results over the upper warning limit than fine blanks, particularly for Al<sub>2</sub>O<sub>3</sub> and MgO. Values for Fe<sub>2</sub>O<sub>3</sub> are consistently above their respective warning limits, though this might reflect contamination from crushing and grinding. Fe<sub>2</sub>O<sub>3</sub> was not determined in the coarse blank samples assayed by SGS. Figures 12.1 and 12.2 displays the results of the coarse and fine blanks, respectively.

Figure 12.1 Coarse Blank Samples

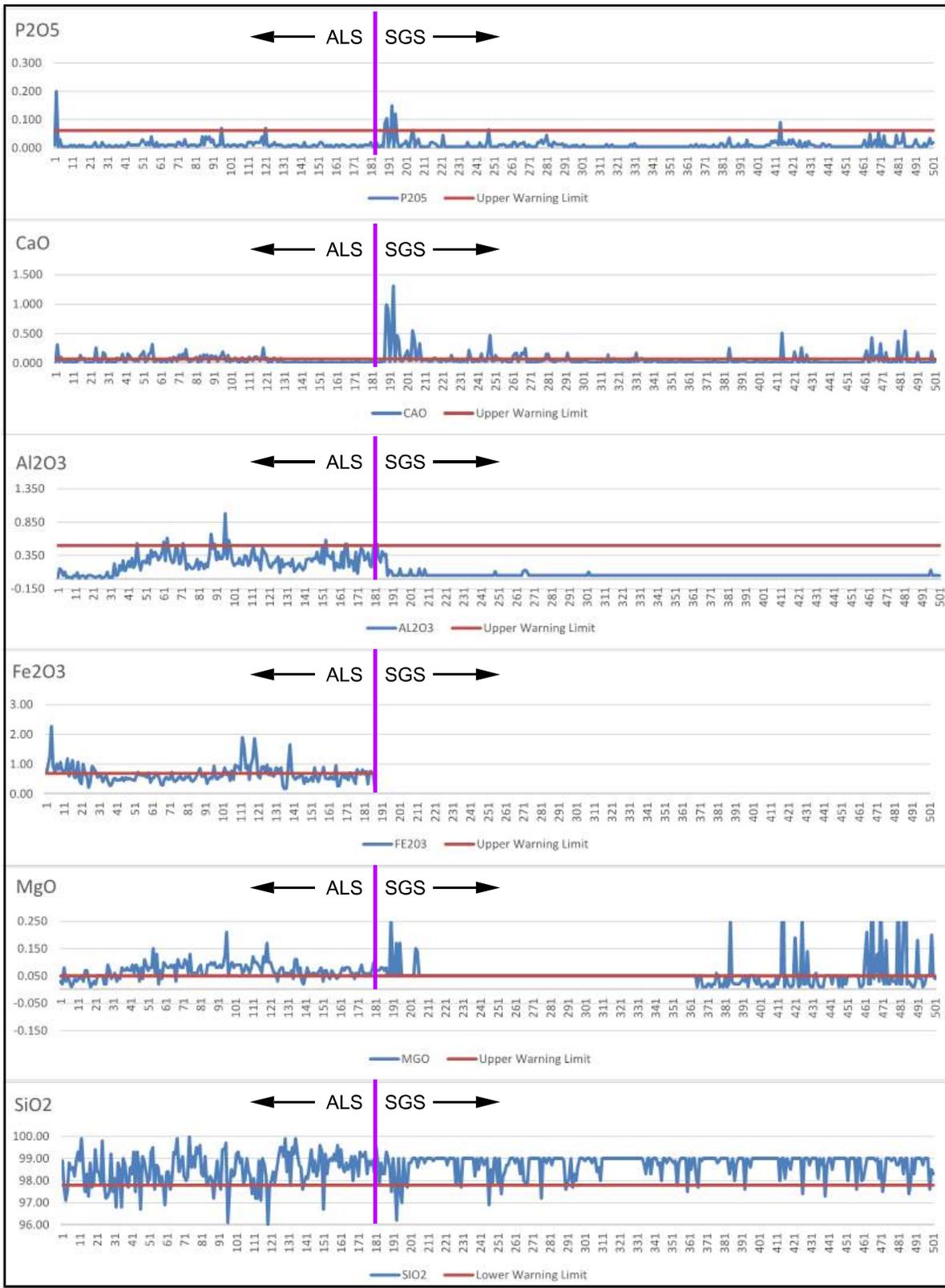
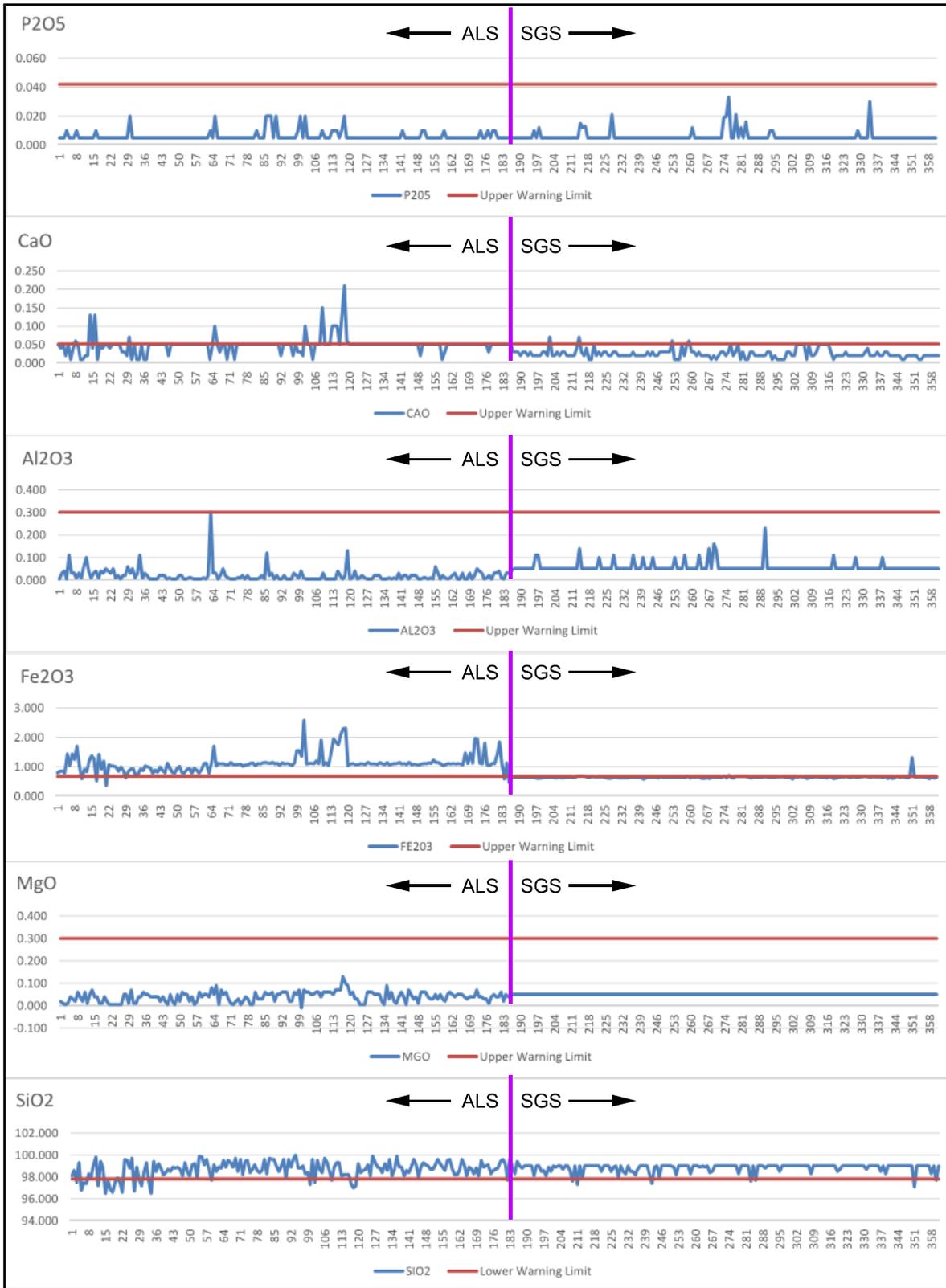


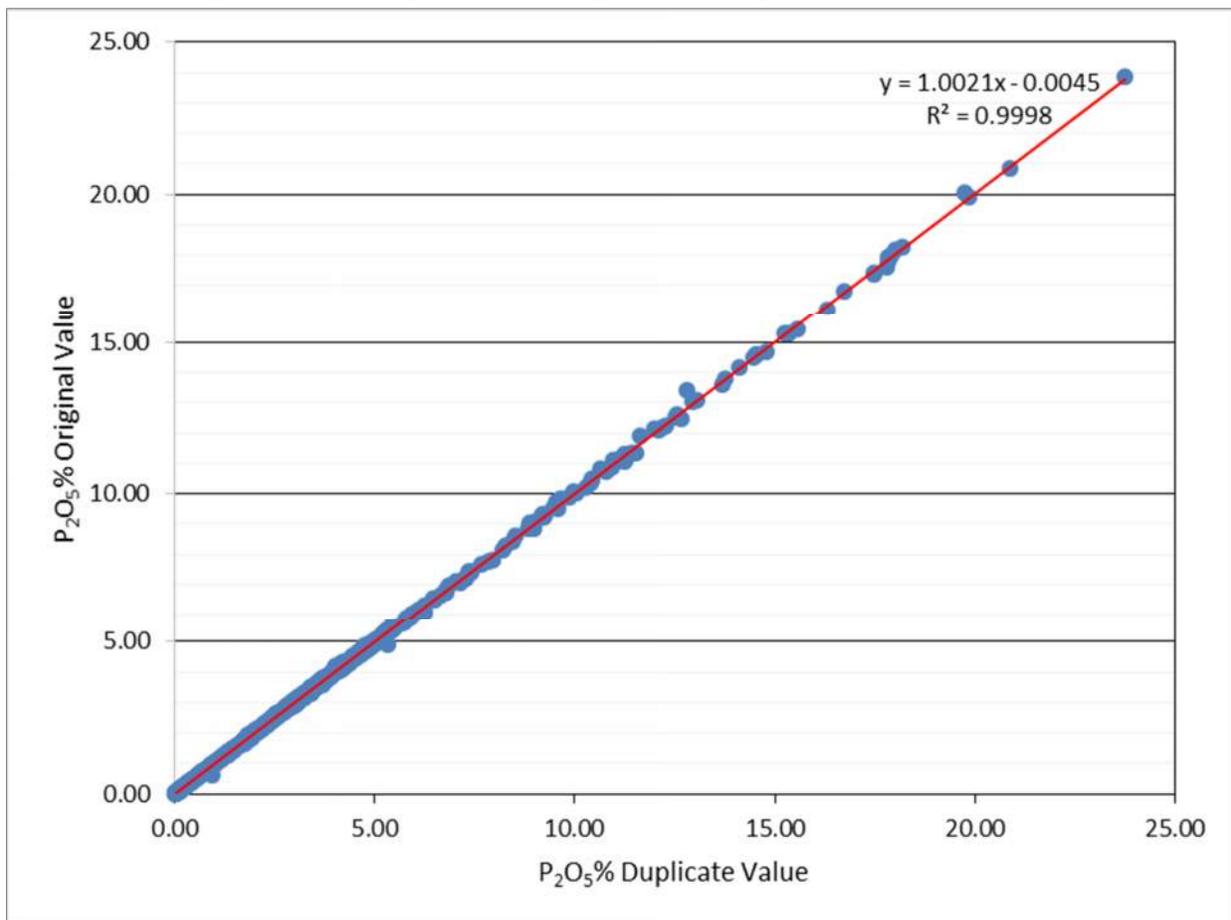
Figure 12.2 Fine Blank Samples



**Duplicate Samples**

Duplicate samples are used to track analytical precision. Duplicate samples are prepared by creating two identical samples for an interval. The second pulp is re-inserted with a blind identity into the submitted samples. There are 1,145 pairs of duplicate samples for Três Estradas. Figure 12.3 compares the results of the duplicate samples with the original pulps. Comparison of duplicates to original samples show a very good correlation coefficient ( $R^2$ ) equal to 0.9999 for Três Estradas. Only one pair of duplicates have a rank absolute difference (HARD) in excess of 10%.

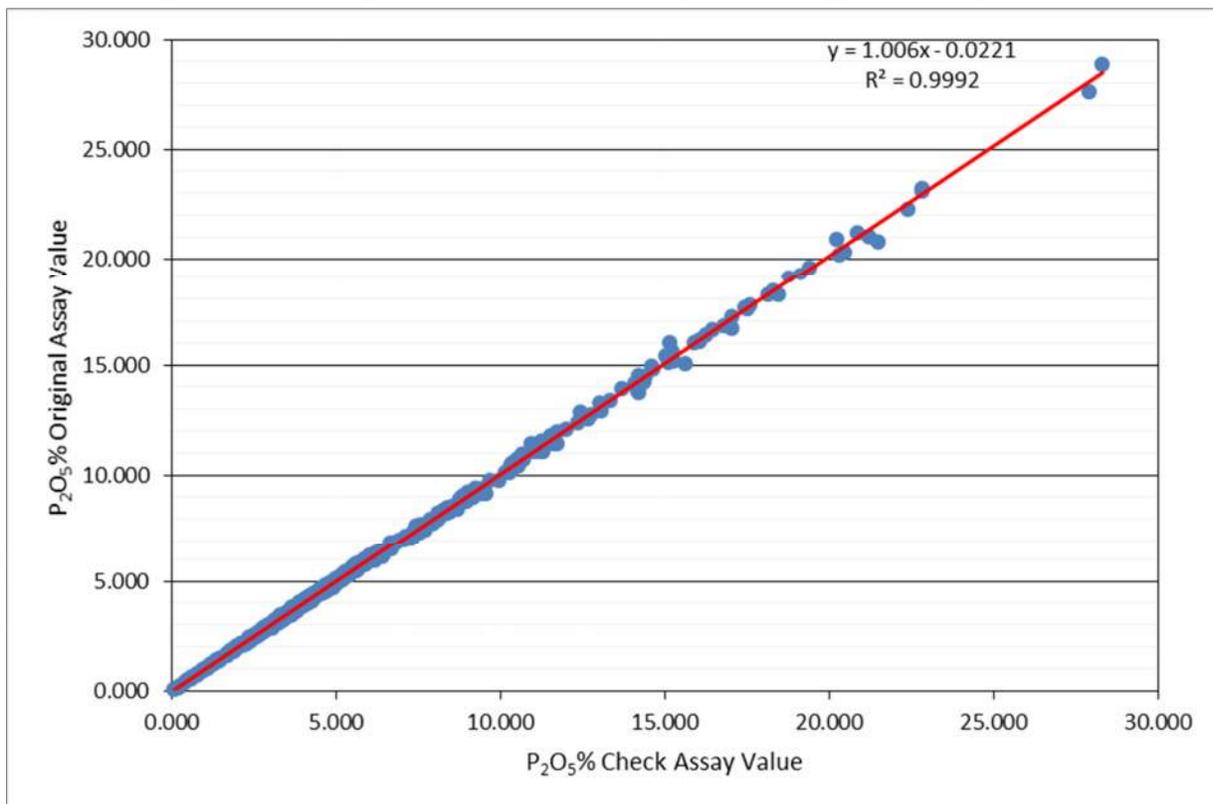
**Figure 12.3 Comparison of Duplicate Samples for Três Estradas**



**Check Assays**

Selected samples are routinely subject to a second umpire analysis as a further check to laboratory performance. During the first two drilling campaigns at Três Estradas, ALS was the primary lab and SGS was used for umpire assays. With subsequent drilling at Três Estradas 5, SGS became the primary laboratory and ALS was used for umpire testing. There are 713 check assays for Três Estradas showing a strong correlation with  $R^2$  equal to 0.9992. Only one sample has a HARD value in excess of 10%. Figure 12.4 compares the results of the check assays for  $P_2O_5$ .

**Figure 12.4 Comparison of Check Assays with Original Assay Values**

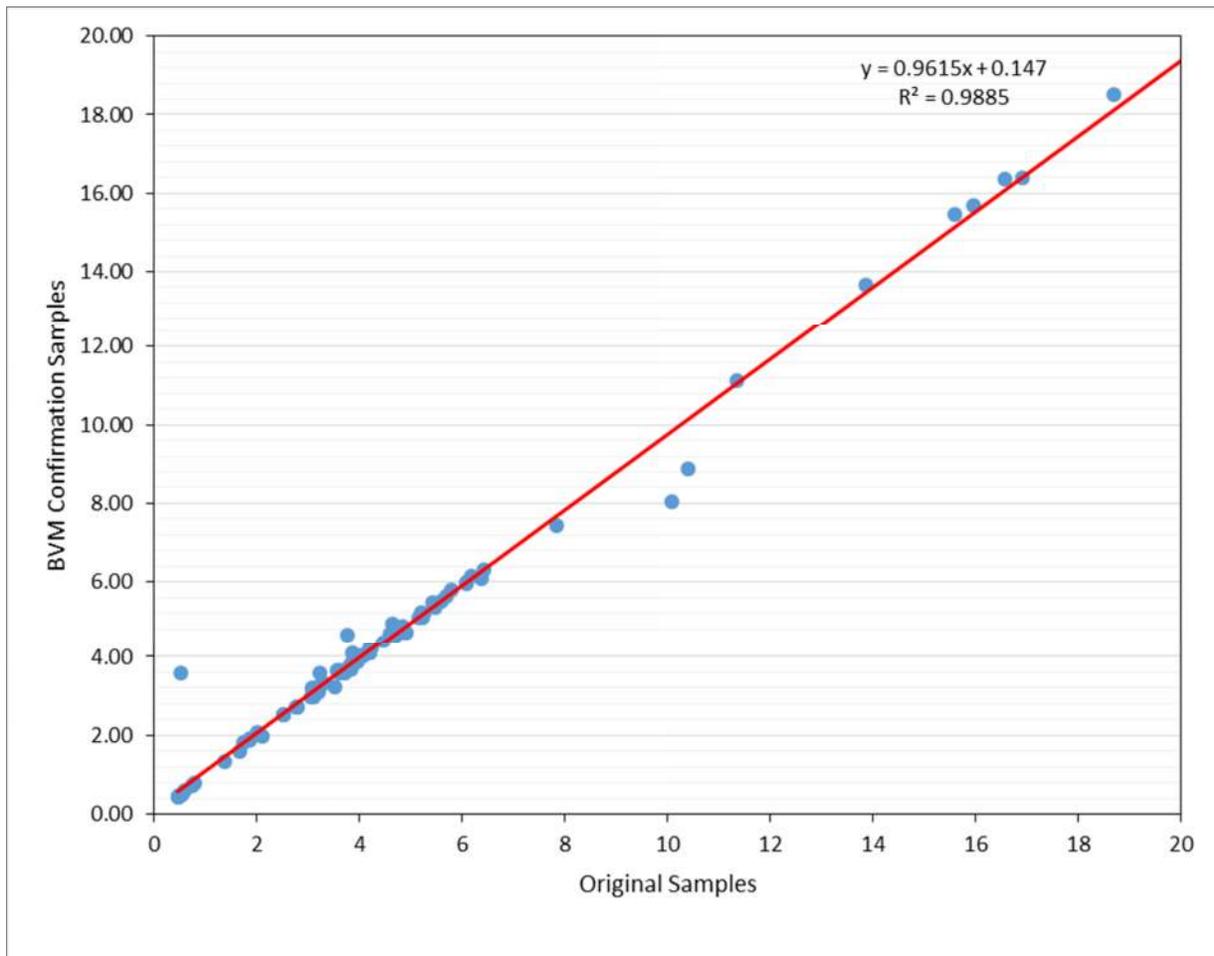


**Confirmation Testing**

During the second site visit, the Geology QP selected a suite of 85 coarse reject samples for confirmation testing. The selected suite of samples represents each phase of drilling, is spatially representative of the deposit and mineral domains and from both core and RC drilling. The selected samples also include five each of reference samples ITAK-910 and ITAK-911 and blank QF-08. Samples were sent to Bureau Veritas

Minerals in Vancouver, BC for XRF analysis. Eighty-two of the samples compare closely with the original samples. Three samples have HARD vales that exceed 10% and upon closer inspection, one of these samples has oxide values that indicate the sample is amphibolite when it should be meta-carbonatite. Figure 12.5 compares the results of the confirmation samples for P<sub>2</sub>O<sub>5</sub>%.

**Figure 12.5 Comparison of Confirmation Assays with Original Assay Values**



**QA / QC Conclusions**

References, blanks, duplicates and check assays show a strong continuity in the dataset without any significant anomalies. The QPs are of the opinion that the data used in this report adequately depicts the geology and mineralization. The data is sufficient for resource estimation.

## **13 MINERAL PROCESSING AND METALLURGICAL TESTING**

### **13.1 INTRODUCTION / SUMMARY**

Mineral processing and metallurgical testing for the Três Estradas Phosphate project has been ongoing since 2012. Over that time the understanding of the metallurgical properties and characteristics of the ore and its response to various processes to concentrate and recover phosphate has gradually improved as a series of studies have steadily increased their relevance and level of detail. The most current level of work reflects a well-developed and considered approach to phosphate recovery that is optimized and verified to a level suitable to support a selection of a process route as well as the basis for preliminary equipment sizing.

Metallurgical and process testing began in 2012 with a bench-top study that covered mineralogical composition, particle size distribution and liberation by size fraction. Potential grade-recovery projections were extrapolated and the study also looked into the applicability of magnetic separation. This led to further work in 2014 which covered comminution and the first specific (bench-scale) flotation test work and resulted in the conclusion (among others) that the recovery of  $P_2O_5$  through flotation might be commercially viable and that column flotation should be considered. This was followed by additional test work (HDA, 2015), again at a bench-scale, that confirmed the commercial potential for phosphate recovery through flotation and provided a better understanding of the nature of  $P_2O_5$  by size fraction and in slimes.

It was at this point that the Eriez Flotation Division (Eriez) was engaged. Eriez had a proven record of designing and implementing column flotation applications at igneous phosphate projects around the world, including in Brazil, and it was determined that they would be well-positioned to develop an understanding of the metallurgical nature of the Três Estradas ore to a point suitable for a feasibility-level study.

Eriez began their engagement with a program in 2016 that produced concentrates from various ore types at a commercially viable level of performance using column flotation. Preliminary bench-scale testing was performed using mechanical test cells in order to optimize the process approach, which was then tested. As a direct result of this approach, Eriez was able to identify effective optimizations of the process and concluded that flotation grade – recovery performance could be reasonably expected to have a significant improvement over historical (i.e., non-optimized) projections. Such optimizations included retention of the fines in the plant feed, the use of a second

cleaner circuit on the fresh carbonatite, and reduction of the Minor Element Ratio, MER, (and subsequent increase in concentrate grade) with the use of magnetic separation.

Metallurgical and process testing has culminated in Eriez's most recent pilot-plant testing for flotation (2017), supported with a recent comminution study (Metso, 2017). A multi-month study, using bulk samples and performed at Eriez Flotation Division's pilot-plant facilities in Pennsylvania, USA, has confirmed the earlier bench-scale work as well as further improvements in the process design to improve grade - recovery projections. The test work was structured to focus specifically on each of the major ore types, including:

- Phase I: Carbonatite;
- Phase II: Calcite;
- Phase III: Saprolite of Carbonatite;
- Phase IV: Amphibolite (both 'fresh', and saprolitic);

The current findings and conclusions from the most recent pilot-plant program, are as follows:

- Phosphate grade and recovery are highly dependent on feed size distribution and grade;
- MIMS and WHIMS magnetic separation can improve the concentrate grades by over 2%, and reduce the MER;
- In saprolite of carbonatite, pilot-plant testing projects that a global phosphate recovery of 87% is achievable at a concentrate grade of 35% P<sub>2</sub>O<sub>5</sub>;
- In carbonatite:
  - Typically, recirculation of the second cleaner tails can provide up to a 2.5% increase in P<sub>2</sub>O<sub>5</sub> recovery at a 30% final grade. The percentage of which recovery is expected to increase is highly dependent upon the circuit feed grade and size distribution.
  - The use of additional cleaner stages may be more effective than a scavenger stage (not accounted for in grade – recovery projections);
  - At a feed-grade of 4%, pilot-plant testing projects that a global phosphate recovery of 80% may be achievable at a concentrate grade of 32% P<sub>2</sub>O<sub>5</sub>.

Testing of the flotation performance for amphibolites, while only at a bench-scale, indicates that the impact of amphibolite on overall plant performance will be negligible.

The conclusions from the latest pilot-plant metrical testing program are based solely on the technical merits. The costs and economics for mineral processing have yet to be considered and are not addressed in this report.

### **13.2 'BENCH-SCALE' METALLURGICAL TESTING – HISTORICAL DATA SUMMARY**

Prior to the current pilot-plant work, four 'bench scale' metallurgical testing programs were performed on material taken from Tres Estradas phosphate project since 2012 (in addition to a costing study, by KEMWorks, in 2015). A summary of these historical test programs and results is presented in Table 13.1 and described below.

Table 13.1 Summary of Agua Metallurgical Testing Programs

Laboratory	Date	Deposit	Report Title	Samples	Testwork Performed	Summary Results	Reported Recommendations
Escola Politecnica da Universidade de Sao Paulo Departamento de Engenharia de Minas e de Petroleo, Laboratorio de Caracterizacao Technologica - LCT- EPUSP	Apr-12	Agua Metais Tres Estradas	Technological Charaterization Studies on Phosphate Ore Samples	RG-CM-01, Saprolite of Carbonatite, RG-CM-02, Fresh Carbonatite, RG-CM-03, Saprolite of Amphibolite, RG-CM-04, Fresh Amphibolite. Saprolite, auger samples. Fresh rock, drill core.	Mineral analyses. Chemical and mineralogical analysis. Mineral separation by size fraction studies using heavy liquids(TBE=2.95g/cm3) and magnetic separation. Mineral associations and liberation studies by size fraction. Potential grade recovery curves were generated for P2O5.		
Escola Politecnica da Universidade de Sao Paulo Departamento de Engenharia de Minas e de Petroleo, Grupo de Pesquisa em Tratamento de minerios - GPTM - EPUSP	Sep-12	Agua Metais Tres Estradas	Complementary Study on the Concentration of Phosphate Ores	Same source as previous test program. EB-01, EB-02, EB-03, EB-05. EB-02 and EB-05 Fresh Carbonatite, EB-01 and EB-03 Weathered Carbonatite.	Laboratory testing to determine a process route to concentrate the phosphate ore from the Tres Estradas RS, Brazil.	The best process route for EB-02 and EB-05 comprises grinding to P80 of 110 microns, low intensity magnetic separation, desliming at 20 microns followed by flotation. The best process route for EB-01 and EB-03 comprises grinding to 210 microns followed by desliming at 20 microns. The ore is conditioned at 36% solids with starch at a pH of 10.6-11.0 and then floated in a rougher, cleaner circuit. The cleaner concentrate is the final concentrate.	EB-02 and EB-05 yielded a concentrate of 3.7% mass with a grade of 34.9% P2O5. Overall recovery was approximately 30% with 37% loss to slimes and 33% lost to flotation tailings. To reduce losses, products should be recycled with 2 stages of cleaning. EB-01 and EB-03 yielded a concentrate of 22 - 32% mass and a grade of 78.2 - 82.8% P2O5. 20% of the P2O5 is lost to slimes and 10% to flotation tailings.
HDA Servicos S.S. Ltda.	May-14	Agua Metais Tres Estradas	Comminution and Flotation Testwork for Rio Grande Project	RG-EB-06, Oxidized Saprolite Rock and RG-EB-07, Fresh Metacarbonatite Rock. Samples were composites of	Comminution and classification testing including Bond work indices, JK Drop Weight tests, batch grinding, specific Gravity determination, magnetic separation and classification for removal of -20micron fine material (slimes) in preparation for flotation.	A series of process routes were investigated including crushing, rod mill grinding and ball mill grinding and magnetic separation. The objective was to achieve the required liberation for flotation while minimizing the amount of slimes generated, which are losses in recovery. EB-06 - drop weight tests not performed due to the fine size of feed material. EB-06 results: BWi = 4.9kWh/t at 250microns and EB-07 was 12.2kWh/t at 105 microns.	The selected flow sheet included staged crushing, staged grinding, wet low intensity magnetic separation and desliming prior to flotation. Recommended further pilot plant testing to determine realistic mass and metallurgical recovery figures.
HDA Servicos S.S. Ltda.	Jun-14	Agua Metais Tres Estradas	Comminution and Flotation Testwork for Rio Grande Project	RG-EB-06, Oxidized Saprolite Rock and RG-EB-07, Fresh Metacarbonatite Rock	Flotation testing.	Selected best test results for EB-06 yielded a 30.8% P2O5 concentrate grade with 58.4% P2O5 recovery. The best results for EB-07 yielded a 27% P2O5 concentrate grade with a 58.1% P2O5 metallurgical recovery.	The best process route for EB-06 comprises grinding to P80 of 212 microns, desliming at 10 microns followed by flotation, including rougher, cleaner and scavenger stages. The best process route for EB-07 comprises grinding to P80 of 106 microns, low intensity magnetic separation, desliming at 10 microns followed by flotation, including rougher, cleaner and recleaner stages. Recommended further pilot plant testing to determine realistic mass and metallurgical recovery figures.
SGS Canada Inc.	May-15	Agua Metais Tres Estradas	A Scoping Level Flotation Test Program on Samples from the Tres Estrada Phosphate Project, prepared for Agua Resouces Limited, Final Report	Fresh Caronatite Samples: Drill holes TED-11-006, TED-11-007, TED-11-010. Oxidized Carbonatite Samples, Drill holes TET-11-022, TET-11-024, TET-12-123, TET-12-124, TET-12-125.	Comminution and classification testing including Bond work indices, SMC testing, and classification for removal of -20micron fine material (slimes) in preparation for flotation.	SMC breakage indices for the fresh carbonatite Sample TED-11-006 and a composite of Samples TED-11-007 and TED-11-010 were 57.3 and 54.6 respectively. Bond work indices for fresh caronatite samples TED-11-006 and a composite of TED-11-007 and TED-11-010 and the oxidized TET series composite were 9.9kWh/t, 9.5kWh/t and 6.4kWh/t respectively. The oxidized composite sample was very soft, consisting of fine saprolite. It was not possible to perform SMC tests on the saprolite as the particle size of the sample was too small.	
SGS Canada Inc.	May-15	Agua Metais Tres Estradas	A Scoping Level Flotation Test Program on Samples from the Tres Estrada Phosphate Project, prepared for Agua Resouces Limited, Final Report	80 kg of the fresh carbonatite samples were stage ground to 106microns and deslimed in 10kg batches and split into three composites G1-G3. Similarly, 10kg of the oxidized carbonatite samples stage ground to 212microns and were composited into a single sample, G4. The samples were deslimed by screening at 20microns and split into charges for flotation testing.	A total of 28 flotation tests were performed on the composite samples using mechanical flotation cells. Two column flotation tests were performed on each of the fresh composite samples, one on the deslimed feed and one on the slimes. A total of 4 flotation tests were performed on deslimed feed from the oxidized composite and 4 cleaner flotation tests were performed on the oxidized slimes fraction.	The flotation flow sheet selected for the <b>fresh</b> composites included a deslimed feed flotation circuit and a -20um slimes flotation circuit. The concentrates from the two circuits were then combined. Both circuits include a pyrite rougher-cleaner circuit followed by an apatite rougher-cleaner circuit. The best results for the fresh carbonatite composites were obtained from tests F17 and F15 on delimed feed and slimes respectively. The combined concentrate graded 22.9% P2O5 with 69% recovery. The best results for oxidized carbonatite were tests F23 and F28 on deslimed feed and slimes respectively. The combined apatite concentrate graded 29.6% P2O5 with 75% P2O5	Recommendations include additional flotation testing on the fresh carbonatite slimes. Flotation testing of ground material without desliming, locked cycle testing on both deslimed feed and slimes, and further column flotation work, but at a pilot scale. Then variability flotation on multiple composites from across the deposit to investigate differences in grade, mineralogy, spatial variation and alteration.

### 13.2.1 TECHNOLOGICAL CHARACTERIZATION (EPUSP, 2012)

The first two studies on processing of Três Estradas ore types were performed in 2012 by two departments of the Escola Politécnica da Universidade de Sao Paulo (EPUSP). The first study was titled “Technological Characterization Study on Phosphate Ore Samples” and the second was titled “Complementary Study on the Concentration of Phosphate Ores”.

The scope of testing covered:

- Chemical and mineralogical analyses;
- Mineral separation by size fraction using heavy liquids;
- Magnetic separation.

Mineral associations and liberation studies by size fraction were performed and potential grade recovery curves were generated for P<sub>2</sub>O<sub>5</sub>. The studies included the determination of the best process route to recover P<sub>2</sub>O<sub>5</sub> into a saleable concentrate, focusing on heavy media gravity separation, as well as magnetic separation.

Four composite samples were provided to LCT-EPUSP for testing: RG-CM-01 (saprolite of carbonatite), RG-CM-02 (fresh carbonatite), RG-CM-03, (saprolite of amphibolites) and RG-CM-04 (fresh amphibolite). The samples were prepared by crushing, milling and wet screening on a 20 µm screen.

The major findings are described below.

Geochemical characterization of the four major rock types, represented by samples RG-CM-01 through 04, is summarized below:

**Table 13.2 Chemical Composition**

Sample	Grades (%)											
	P <sub>2</sub> O <sub>5</sub>	CaO	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	MgO	Na <sub>2</sub> O	K <sub>2</sub> O	TiO <sub>2</sub>	SrO	BaO	PF
RG-CM-01	15.0	19.5	23.2	3.7	24.8	2.56	<0.10	<0.10	2.24	0.25	0.20	4.22
RG-CM-02	4.32	38.2	6.8	1.2	7.28	8.05	<0.10	0.40	0.83	<0.10	0.19	31.3
RG-CM-03	3.73	11.2	38.3	8.5	16.6	8.79	0.95	1.19	4.68	4.68	<0.10	6.64
RG-CM-04	3.04	17.0	32.2	6.7	14.7	9.39	0.59	2.43	0.20	0.20	0.23	7.32

Apatite content was found to be as follows (note: apatite was the only identified phosphate bearing mineral);

- 39% - RG-CM-01 – (saprolite of carbonatite);
- 10% - RG-CM-02 – (fresh carbonatite);
- 9% - RG-CM-03 – (saprolite of amphibolite);
- 6% - RG-CM-04 – (fresh amphibolite).

The remaining mineral composition of each of the composite samples is summarized below:

**Table 13.3 Mineral Composition**

Mineral	Samples			
	CM-01	CM-02	CM-03	CM-04
Apatite	39	10	9	6
Carbonates	-	70	-	11
Oxides (Fe, Ti, Mn)	31	4	9	5
Philosilicates	10	9	32	31
Quartz + Feldspar	16	2	9	6
Titanite	-	-	9	9
Amphibole	3	3	31	31
Others	1	2	1	1

It was found that the mass and recovery losses at the 20µm fraction were significant in both the saprolites and fresh rock samples (both carbonatite and amphibolite):

- Saprolite of Carbonatite: mass loss of 39.0%, recovery loss of 25.7%;
- Saprolite of Amphibolite: mass loss of 21.5%, recovery loss of 16.0%;
- Fresh Carbonatite: mass loss of 51.6%, recovery loss of 44.5%;
- Fresh Amphibolite: mass loss of 44.3%, recovery loss of 41.5%;

Degree of liberation was found to be as follows:

- 85% at 0.15 mm fraction - RG-CM-01 (saprolite of carbonatite);
- 90% at 0.074 mm fraction - RG-CM-02 (fresh carbonatite);
- 82% at 0.074 mm fraction - RG-CM-03 (saprolite of amphibolite);
- 84% at 0.15mm fraction - RG-CM-04 (fresh amphibolite).

The sink /float and distribution of magnetic / non-magnetic products is as follows:

**Table 13.4 Sink /Float and Magnetics Separation Results**

Flow		CM-01			CM-02		
		% Yield	% P <sub>2</sub> O <sub>5</sub>	% Dist. P <sub>2</sub> O <sub>5</sub>	% Yield	% P <sub>2</sub> O <sub>5</sub>	% Dist. P <sub>2</sub> O <sub>5</sub>
+ 37 µm fraction	Float	21.8%	3.9%	5.2%	67.6%	1.6%	25.8%
	Sink Mag	24.8%	5.1%	7.8%	11.4%	4.7%	12.5%
	Sink Non-Mag	25.8%	38.4%	61.2%	5.4%	30.5%	38.5%
	Total	72.4%	16.6%	74.2%	84.4%	3.9%	76.7%
- 37 µm Fraction		27.6%	15.2%	25.8%	15.6%	6.4%	23.3%
Feed		100.0%	16.2%	100.0%	100.0%	4.3%	100.0%
Flow		CM-03			CM-04		
		% Yield	% P <sub>2</sub> O <sub>5</sub>	% Dist. P <sub>2</sub> O <sub>5</sub>	% Yield	% P <sub>2</sub> O <sub>5</sub>	% Dist. P <sub>2</sub> O <sub>5</sub>
+ 37 µm fraction	Float	36.0%	1.2%	11.0%	20.2%	0.9%	6.6%
	Sink mag	32.8%	1.5%	12.5%	58.2%	1.1%	24.4%
	Sink Non-Mag	9.1%	22.7%	52.4%	5.9%	20.6%	46.1%
	Total	77.9%	3.8%	75.9%	84.3%	2.4%	77.0%
- 37 µm Fraction		22.1%	4.3%	24.1%	15.7%	3.9%	23.0%
Feed		100.0%	3.9%	100.0%	100.0%	2.6%	100.0%

From this early testing phase, the following conclusions were reached:

The four samples present the same mineralogical assembly varying only in the proportion of components minerals. Apatite is the P<sub>2</sub>O<sub>5</sub> bearing mineral with contents varying from 6% to 39%, depending on the lithology of the sample.

The apatite liberates at a relatively fine size, suggesting that a fine grinding will be required to obtain the commercial grade concentrate.

Gravity and magnetic concentration technologies might produce commercial grade concentrate (sink, non-mag) for the saprolite of carbonatite (CM-01) and fresh carbonatite (CM-02) but the P<sub>2</sub>O<sub>5</sub> recovery is low, (61.2% and 38.5%, respectively). For amphibolites, the concentrate grade was below 23%. These results indicated that gravity and magnetic concentration would not be a good option for concentration.

### 13.2.2 TECHNOLOGICAL CHARACTERIZATION AND FLOTATION (HDA, 2014)

In 2014, HDA Services (HDA) performed a study with the objective of proposing an adequate comminution and flotation circuit for processing the Três Estradas phosphate project. The Scope of Work included comminution, magnetic separation, desliming and bench scale flotation, at different particle size distributions. Tests were performed on both fresh carbonatite and saprolite samples using conventional mechanical flotation cells.

The oxidized (saprolite) sample was labeled as RG-EB-06, while the fresh carbonatite sample was referred to as RG-EB-07 (the two samples were obtained from auger holes, and drill cores, respectively). A detailed description for the processing test can be found in HDA's report "*Comminution and Flotation Test Work for Rio Grande Project*" (HDA, 2014).

The main results of the characterization and test work are summarized as follow.

- Average feed grade (% P<sub>2</sub>O<sub>5</sub>):
  - 11.1% (EB06 – saprolite);
  - 4.54% (EB07 – fresh carbonatite).
- Average density:
  - 2.94 (EB06 – saprolite);
  - 2.93 (EB07 – fresh carbonatite);
- Grindability testing (Bond Work Index):
  - 4.9 kWh/t (EB06 – saprolite);
  - 12.2 kWh/t (EB07 – fresh carbonatite).
- Losses at desliming (minus 20 µm):
  - 50.1% yield, and 32.1% P<sub>2</sub>O<sub>5</sub> at P90 = 212 µm (EB06 – saprolite);
  - 27.7% yield, and 30.6% P<sub>2</sub>O<sub>5</sub> at P90 = 150 µm (EB07 – fresh carbonatite).
- Losses at desliming (minus 10 µm):
  - 27.6% yield, and 9% P<sub>2</sub>O<sub>5</sub> at P90 = 212 µm (EB06 – saprolite);
  - 26.2% yield, and 17.3% P<sub>2</sub>O<sub>5</sub> at P90 = 76 µm (EB07 – fresh carbonatite).
- Flotation results (deslimed feed):
  - 30.8% grade and 58.4% P<sub>2</sub>O<sub>5</sub> metallurgical recovery (EB06 – saprolite);
  - 27.0% grade and 58.1% P<sub>2</sub>O<sub>5</sub> metallurgical recovery (EB07 – fresh carbonatite).

From this early testing phase, the following conclusions were reached:

This test campaign indicated that a flotation circuit might produce a commercial grade  $P_2O_5$  concentrate, treating saprolite or fresh carbonatite, in spite of the relatively low metallurgical recovery.

The metallurgical recovery was strongly affected by the significant loss of mass at the desliming stage. Finer-cut desliming and a staged grinding circuit was recommended to reduce the slimes produced during the grinding operation, while producing sufficient liberation for flotation.

The batch-testing provided a solid basis for planning a pilot-plant campaign in order to fully assess realistic mass and metallurgical recovery figures. Moreover, it was concluded that column flotation should provide adequate hydrodynamic conditions for enhanced metallurgical performance.

### **13.2.3 FLOTATION TESTWORK (SGS, 2015)**

In 2015, SGS Canada Inc. (SGS) performed a study similar to that of HDA, titled “*A Scoping Level Flotation Test Program on Samples from Três Estradas Phosphate Project*” (SGS, 2015). The objectives of this test program were to confirm metallurgy established in previous studies, the feasibility of improving overall  $P_2O_5$  recovery to 65% (at 30%  $P_2O_5$  grade), and to evaluate column flotation performance on slimes.

As before, the study was conducted on drill core samples for saprolite and fresh carbonatite. The program covered comminution, desliming, and flotation with specific testwork including: sample receipt and preparation; head-sample chemical analysis; grindability testing; stage-grinding and desliming; size fraction chemical analysis; flotation testing; magnetic separation testing; and product mineralogical analysis.

The majority of the flotation work was performed using mechanical flotation cells and included pyrite flotation followed by flotation of deslimed feed and slimes feed separately. Two column flotation tests were performed on each of the fresh composite samples (the deslimed sample and the slimes sample) for a total of 4 column flotation tests.

The main results of the characterization and test work are summarized as follows:

- Average feed grade (% P<sub>2</sub>O<sub>5</sub>):
  - 11.3% (saprolite);
  - 4.38% (carbonatite).
- Grindability testing (Bond Work Index):
  - 6.2 kWh/t (saprolite)
  - 9.5 kWh/t (sample 11-006 - fresh carbonatite)
  - 9.9 kWh/t (sample 11-007/10 - fresh carbonatite).
- Grindability testing (SMC A x b):
  - 57.3 (sample 11-006 – fresh carbonatite).
  - 54.6 (sample 11-007/10 – fresh carbonatite).
- Flotation combined results (flotation was completed on combined deslimed feed and slimes):
  - 29.6% grade and 75 % P<sub>2</sub>O<sub>5</sub> metallurgical recovery (saprolite);
  - 22.9% grade and 69% P<sub>2</sub>O<sub>5</sub> metallurgical recovery (fresh carbonatite).

As in earlier testing (EPUSP, 2012), it was confirmed that slimes (-20 µm) generation was significant for both saprolite and fresh rock, with similar chemical compositions in both the fine and coarse fractions.

From this early testing phase, grindability test results suggested that the fresh carbonatite would require more power for grinding.

The results of this flotation test campaign suggested that there could be significant loss of P<sub>2</sub>O<sub>5</sub> without adequate processing and that separate flotation of the coarse (+ 20 µm) fraction and fine fraction (- 20 µm), for both types of ore, would not be a very effective solution.

The combined final concentrate grade (produced by separate flotation circuit) was below 23% P<sub>2</sub>O<sub>5</sub> and the recoveries were below 75%.

#### **13.2.4 FLOTATION AND MAGNETIC SEPARATION TEST WORK (ERIEZ, 2016)**

In 2016, Eriez performed a flotation study, entitled “*Final Report SAN 18850 - MTR 16-004* (Eriez, 2016)”. The objective of this study was to produce concentrates from each ore type (fresh carbonatite and saprolite), bearing a P<sub>2</sub>O<sub>5</sub> grade of 30%, or greater, at a global P<sub>2</sub>O<sub>5</sub> recovery of 80%, using column flotation. The study also served as the basis for a preliminary flowsheet based on column flotation.

Classification and comminution techniques were used to prepare individual fresh rock and oxide material feeds at 95% passing 212  $\mu\text{m}$  prior to flotation. Preliminary bench-top mechanical flotation tests were carried out to determine the optimal reagent scheme required for the successful flotation of both types of ore. Before flotation, the ore was submitted to a magnetic separation (low-intensity magnetic separation (LIMS) and medium-intensity magnetic separation (MIMS)). The flotation test work was executed with the whole ore, without desliming. The final concentrate was also submitted to a wet high magnetic separation (WHIMS) operation.

The main results of this test campaign to produce  $\text{P}_2\text{O}_5$  concentrate, are summarized as follows:

- Average feed grade (%  $\text{P}_2\text{O}_5$ ):
  - 11.76% (saprolite);
  - 4.21% (carbonatite).
- Specific gravity:
  - 2.27 (saprolite);
  - 2.61 (fresh carbonatite).
- Magnetic wet drum separation of plant feed (LIMS/MIMS results – non-magnetic flotation feed):
  - 96.8% yield and 99.5 %  $\text{P}_2\text{O}_5$  recovery (saprolite);
  - 95.1% yield and 99.5 %  $\text{P}_2\text{O}_5$  recovery (fresh carbonatite).
- Proposed flotation circuit (columns):
  - Rougher-Cleaner (saprolite);
  - Rougher – Cleaner – Cleaner - Scavenger column flotation circuit (fresh carbonatite).
- Flotation results (grade / recovery):
  - 31.1%  $\text{P}_2\text{O}_5$  concentrate with 80.1 %  $\text{P}_2\text{O}_5$  recovery (saprolite);
  - 30.25%  $\text{P}_2\text{O}_5$  concentrate with 84.6%  $\text{P}_2\text{O}_5$  (fresh carbonatite).
- Magnetic separation of phosphate concentrates (WHIMS results – non-magnetic – flotation feed):
  - 91.1% yield and 98.3 %  $\text{P}_2\text{O}_5$  recovery with 37.3%  $\text{P}_2\text{O}_5$  concentrate (saprolite);
  - 95.1% yield and 98.7%  $\text{P}_2\text{O}_5$  recovery with 33.5%  $\text{P}_2\text{O}_5$  concentrate (fresh carbonatite).

From this early testing phase, the following conclusions were reached:

During project development, it was confirmed that a significant percentage of the inherent  $P_2O_5$  was present in the minus 20  $\mu m$  fraction. As a result, it was found that removal of this fine material from the flotation feed would significantly reduce the global or total recovery. Bench-top mechanical flotation testing performed on both ores indicated that the 212 x 60  $\mu m$  size fractions were more amenable to flotation than the 60 x 0  $\mu m$  size fraction (which exhibited a very poor performance). Thus, the subsequent column flotation tests were conducted on unclassified 212 x 0  $\mu m$  size fractions.

In fresh carbonatite, the column flotation test results confirmed that a final concentrate grade of 30.25%  $P_2O_5$  with a global  $P_2O_5$  recovery of 84.6% can be achieved.

Column flotation results of tests performed on the saprolite ore, produced a 31.1%  $P_2O_5$  concentrate at a  $P_2O_5$  recovery of 80.1%.

LIMS and WHIMS testing conducted on the fresh carbonatite and saprolite column concentrates demonstrated that the minor element ratio (MER) could be reduced using magnetic separation. As a result of removing magnetic material from the concentrate, the  $P_2O_5$  grade of both concentrates also increased by approximately 1 to 2%. The  $P_2O_5$  recovery from the magnetic separation circuit (non-magnetic fraction) is higher than 98% for both types of ore.

### **13.3 'PILOT-PLANT' METALLURGICAL TESTS AND RESULTS (2017)**

In 2017, a new testing program was carried out with the following objectives:

- To confirm the previous metallurgical findings defined in the 2016 test campaign by Eriez and/or establish more reliable and detailed information to define Design Criteria for Project development;
- To generate data to support selection of a process route and appropriate equipment sizing;

Several companies and laboratories were involved in this program: Metso Minerals developed and executed the comminution test work. Eriez continued their work by performing pilot-plant scale column flotation studies. Pocock Industrial (Pocock), of Salt Lake City, developed thickening and filtration tests of concentrate and tailings as well as geotechnical and rheological properties determinations. Laboratories included Bureau Veritas for assays on concentrates and tailings.

### **13.3.1 COMMINUTION TESTING (METSO)**

Metso Minerals (Metso) was selected to develop the comminution test work. The objective of this test program was to establish the characteristics of the ore at Três Estradas, regarding crushability and grindability in order to provide reliable and consistent data to support the selection of the comminution circuit as well as the sizing of the comminution equipment for the industrial plant.

To achieve this objective a testing program was carried out covering the following determination and assays: Sag Mill Comminution (SMC) tests, Crushing Bond Work Index (CWI tests), Bond Ball Mill Work Index (BWi), Rod Mill Work Index (RWi), Point Load Test - PLT (UCS) and Bond Abrasion Index (Bond Ai).

#### **13.3.1.1 SAMPLING FOR COMMINUTION TESTING**

To cover the main lithology of Três Estradas samples of fresh carbonatite (MCBT, nine samples), saprolite of carbonatite (CBTSAP, two samples), fresh amphibolite (MAMP, one sample) and saprolite of amphibolite (AMPSAP, one sample) were gathered. The MCBT (plus weathered MCBT) is the predominant type of mineable ore corresponding to 87% of the total reported resource. The CBTSAP represents 6% of the total and the MAMP and AMPSAP represent, respectively, 6% and 1% of the total resource. The criteria to select the samples were based on the geo-spatial approach.

To ensure good representation, the samples were selected considering the lithological and mineralogical composition. In addition to the lithological characterization, geospatial representation was ensured by sampling from different depths, along the strike of the ore body. The sampling distribution considered five cross-sections, spaced 400 to 550 m, along three different levels. In order to provide the samples for this program, a specific HQ drilling campaign was carried out. The campaign totalized 870 m in six drill holes to generate 13 samples (nine in MCBT, 1 in MAMP, 2 in CBTSAP and 1 in AMPSAP).

#### **13.3.1.2 COMMINUTION TESTING PROGRAM**

A detailed description for the procedures and test work results is given in the report “*Programa de Testes de Cominuição para o Projeto Três Estradas – Relatório Final*” (Metso, 2017).

Metso established the required amount of each one of the samples to perform the proposed tests. The total amount of samples delivered to Metso was:

- 1,500kg of fresh carbonatite (MCBT);
- 240kg of saprolite of carbonatite (CBTSAP);
- 110kg of fresh amphibolite (MAMP);
- 120kg of saprolite of amphibolite (AMPSAP).

The main results of Metso comminution testing campaign are summarized below. Abrasion index testing yielded the following results:

**Table 13.5 Abrasion Index**

ID Samples		Abrasion Index (g)	Abrasiveness Classification
CT-001	Fresh Carbonatite	0.029	Non-Abrasive
CT-002	Saprolite of Carbonatite	na	Non-Abrasive
CT-003	Fresh Carbonatite	0.011	Non-Abrasive
CT-004	Fresh Carbonatite	0.071	Slightly Abrasive
CT-005	Saprolite of Amphibolite	na	Non-Abrasive
CT-006	Fresh Carbonatite	0.175	Average Abrasion
CT-007	Saprolite of Carbonatite	na	Non-Abrasive
CT-008	Fresh Carbonatite	0.050	Slightly Abrasive
CT-009	Fresh Carbonatite	0.097	Slightly Abrasive
CT-010	Fresh Carbonatite	0.038	Non-Abrasive
CT-011	Fresh Carbonatite	0.048	Non-Abrasive
CT-012	Fresh Carbonatite	0.030	Non-Abrasive
CT-013	Fresh Amphibolite	0.033	Non-Abrasive

Results of testing to determine the Bond Work Index (for ball and rod milling) are as follows:

**Table 13.6 Bond Work Index (Ball and Rod Milling)**

ID Samples		Bond Ball Mill Work Index		Bond Rod Mill Work Index	
		(kWh/t)	(kWh/st)	(kWh/t)	(kWh/st)
CT-001	Fresh Carbonatite	11.56	10.49	12.00	10.88
CT-002	Saprolite of Carbonatite	9.30	8.43	6.23	5.65
CT-003	Fresh Carbonatite	9.80	8.89	10.19	9.25
CT-004	Fresh Carbonatite	11.98	10.87	13.64	12.37
CT-005	Saprolite of Carbonatite	8.97	8.14	4.96	4.50
CT-006	Fresh Carbonatite	11.90	10.80	11.89	10.78
CT-007	Saprolite of Amphibolite	8.43	7.65	4.85	4.40
CT-008	Fresh Carbonatite	10.89	9.88	13.78	12.50
CT-009	Fresh Carbonatite	11.13	10.10	13.04	11.83
CT-010	Fresh Carbonatite	8.82	8.00	10.24	9.29
CT-011	Fresh Carbonatite	9.04	8.20	10.64	9.65
CT-012	Fresh Carbonatite	10.15	9.21	9.48	8.60
CT-013	Fresh Amphibolite	10.63	9.64	13.87	12.59

The Bulk Density and Specific Gravity for each ore type is reported below:

**Table 13.7 Bulk Density and Specific Gravity**

ID SAMPLE		Bulk Density (t/m <sup>3</sup> )	Specific Gravity (t/m <sup>3</sup> )
CT-001	Fresh Carbonatite	1.79	2.87
CT-002	saprolite	1.28	1.70
CT-003	Fresh Carbonatite	1.85	2.91
CT-004	Fresh Carbonatite	1.81	2.94
CT-005	Saprolite of Amphibolite	1.20	2.10
CT-006	Fresh Carbonatite	1.76	2.74
CT-007	Saprolite	1.04	1.90
CT-008	Fresh Carbonatite	1.83	2.90
CT-009	Fresh Carbonatite	1.85	2.87
CT-010	Fresh Carbonatite	1.98	2.99
CT-011	Fresh Carbonatite	1.84	2.97
CT-012	Fresh Carbonatite	1.79	2.90
CT-013	Fresh Amphibolite	1.69	2.79

Point Load testing results are summarized as follows:

**Table 13.8 Point Load Tests**

ID Samples		Point Load Test - Is50		
		Average (Mpa)	Std. Dev. (Mpa)	Estimate UCS
CT-002	Saprolite of Carbonatite	0.31	0.04	7.44
CT-005	Saprolite of Amphibolite	0.27	0.05	6.48
CT-007	Saprolite of Carbonatite	0.28	0.04	6.72

The results of Impact Work Index testing are summarized below:

**Table 13.9 Impact Work Index**

ID Samples		Impact Work Index (Wii)
		Results (kWh/t)
CT-001	Fresh Carbonatite	5.75
CT-010	Fresh Carbonatite	5.00
CT-011	Fresh Carbonatite	7.41

SMC tests results are covered in the table below:

**Table 13.10 SMC Results**

Sample ID		SMC Test						
		Dwi	A	b	A*b		Sg	ta
		Result (kWh/m <sup>3</sup> )	-	-	-	Class	(t/m <sup>3</sup> )	-
CT-001	Fresh Carbonatite	4.00	70.4	1.02	71.8	Soft	2.87	0.65
CT-002	Saprolite of Carbonatite	na	na	na	na	na	na	na
CT-003	Fresh Carbonatite	4.13	78.2	0.90	70.4	Soft	2.91	0.63
CT-004	Fresh Carbonatite	4.67	75.1	0.84	63.1	Mod. Soft	2.94	0.56
CT-005	Saprolite of Amphibolite	na	na	na	na	na	na	na
CT-006	Fresh Carbonatite	na	na	na	na	na	na	na
CT-007	Saprolite of Carbonatite	na	na	na	na	na	na	na
CT-008	Fresh Carbonatite	5.07	78.9	0.73	57.6	Mod. Soft	2.90	0.51
CT-009	Fresh Carbonatite	4.22	75.7	0.90	68.1	Soft	2.87	0.61
CT-010	Fresh Carbonatite	3.67	78.7	1.04	81.8	Soft	2.99	0.71
CT-011	Fresh Carbonatite	2.28	74.0	1.76	130.2	Very Soft	2.97	1.14
CT-012	Fresh Carbonatite	3.61	80.5	1.00	80.5	Soft	2.90	0.73
CT-013	Fresh Amphibolite	4.25	76.5	0.86	65.8	Mod. Soft	2.79	0.61

The comminution testing program results confirmed, as previously suggested in earlier testing, that the saprolites are less abrasive and required less power to achieve the required size distribution. Also, the results indicated that the grinding behavior of the saprolite of amphibolite would be similar to that of the saprolite of carbonatite. Despite being more abrasive than saprolite ore, the fresh rock samples, regardless of geospatial location, are generally considered non-abrasive, or slightly abrasive. Sample pairs taken from the same section of ore body but at different elevations, indicated a slight trend of hardening with greater depth.

### **13.3.2 FLOTATION PILOT-PLANT TESTING (ERIEZ, 2017)**

The objective of the study was to produce phosrock ( $P_2O_5$  concentrate) according to accepted market specifications, with maximum global recovery of  $P_2O_5$ , using column flotation with verification at a pilot-plant scale. Producing this concentrate would verify global phosphate grades and recoveries (proposed during the open-circuit test program of 2016) for use in a feasibility study. In addition, the Eriez test program was used as the basis of establishing the process flowsheet for the flotation section, defining mass balance, indicating reagents and dosages and the sizing/selection of flotation equipment.

#### **13.3.2.1 SAMPLING FOR FLOTATION TESTING**

To cover the main lithologies of the ore from the Três Estradas Phosphate Project, samples of fresh carbonatite and amphibolites as well as the saprolite of each the two ore types, were gathered. The quantity of each ore-type sample provided by Aguia to ERIEZ is listed below:

- 1,889kg of fresh carbonatite (MCBT);
- 791kg of saprolite of carbonatite (CBTSAP);
- 731kg of fresh amphibolite (MAMP);
- 469kg of saprolite of amphibolite (AMPSAP).

The criteria to select and make the composite samples for flotation metallurgical tests, that would ensure an adequate representation of run-of-mine (ROM) plant feed, was defined by Águia and based on reasonable industry practices, as described in document. “*Três Estradas Sample Selection Memo - Pilot Tests – ERIEZ*” (Águia, March 15, 2017).

#### **13.3.2.2 SAPROLITE TESTING**

For saprolite, the primary requirement of the test program was to confirm or re-define the global phosphate grades and recoveries determined in the open circuit test program (2016 ‘bench-scale’ campaign), using a rougher-cleaner flotation circuit. In addition, continuous column flotation testing was utilized to generate bulk concentrate and tailings samples for subsequent characterization studies, for use in feasibility-level engineering and design.

Of approximately 1,000kg of sample received, 600kg of saprolite ore was split to provide a final sample. The as-received material was classified and wet-screened before being

homogenized and split to form representative samples in the form of a slurry (25% solids, by weight), in preparation for continuous operation of an automated column flotation circuit (consisting of two, 3-inch diameter column flotation cells). In accordance with the sample preparation procedure for saprolitic material, the coarser screen overflow was not used in testing.

The tables below show the particle size and phosphate distribution of the coarse and fine fractions (plus and minus 212 µm).

**Table 13.11 Coarse and Fine Fractions Particle Size and Phosphate Distribution**

Saprolite 212µm Screen Oversize					
Screen Size (µm)	Weight (g)	Weight (%)	Cum. % Passing	%P <sub>2</sub> O <sub>5</sub>	P <sub>2</sub> O <sub>5</sub> Dist.
+1000	271.6	29.8	100.0	6.6	19.77
-1000x850	31.1	3.4	70.2	8.7	2.98
-850x600	90.8	10.0	66.8	10.1	10.11
-600x425	140.6	15.4	56.8	12.3	19.07
-425x300	126.7	13.9	41.3	12.4	17.33
-300x212	102.9	11.3	27.4	12.8	14.53
-212	146.9	16.1	16.1	10.0	16.20
Cumulative	910.6	100.0	378.6	9.96	100.00
Saprolite 212µm Screen Undersize (Column Flotation Feed)					
Screen Size (µm)	Weight (g)	Weight (%)	Cum. % Passing	%P <sub>2</sub> O <sub>5</sub>	P <sub>2</sub> O <sub>5</sub> Dist.
+212	101.5	7.0	100	9.7	6.73
212x150	136.6	9.4	93.0	11.4	10.65
150x106	166.4	11.5	83.6	11.7	13.31
106x75	148.4	10.2	72.1	13.5	13.71
75x53	121.9	8.4	61.9	13.9	11.59
-53	776.8	53.5	53.5	8.2	44.01
Cumulative	1451.6	100.0		10.0	100.0

Eriez performed the pilot testing at their Eriez Flotation Division test facilities in Pennsylvania, USA, using a sophisticated pilot-plant circuit that can be adjusted to accommodate various circuit configurations and conditions, as well as accounting for re-circulating loads. The following figures show the flotation apparatus and details of the saprolite flotation. In Figure 13.2, the difference in color of the froth in the columns as well as of the tails and concentrate between the rougher and cleaner is clearly visible, thus demonstrating the effect of the cleaner stage.

**Figure 13.1 Two-Stage Automated Column Flotation Circuit**

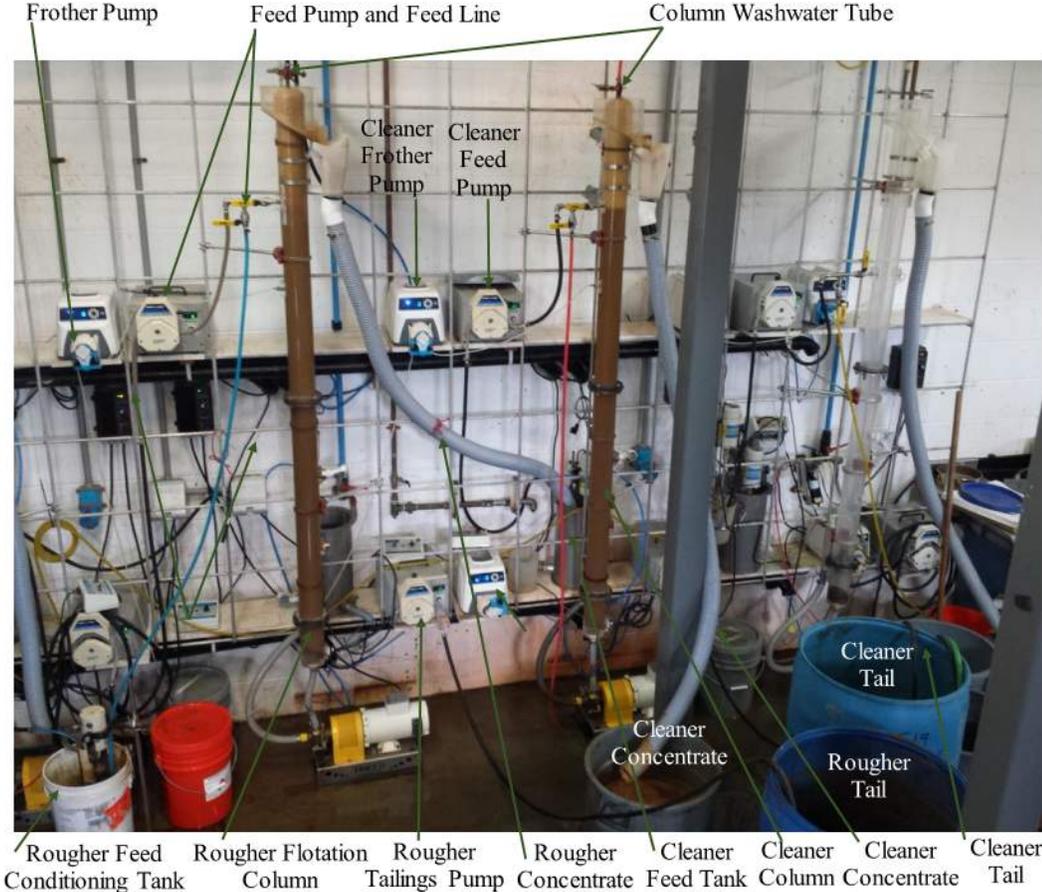
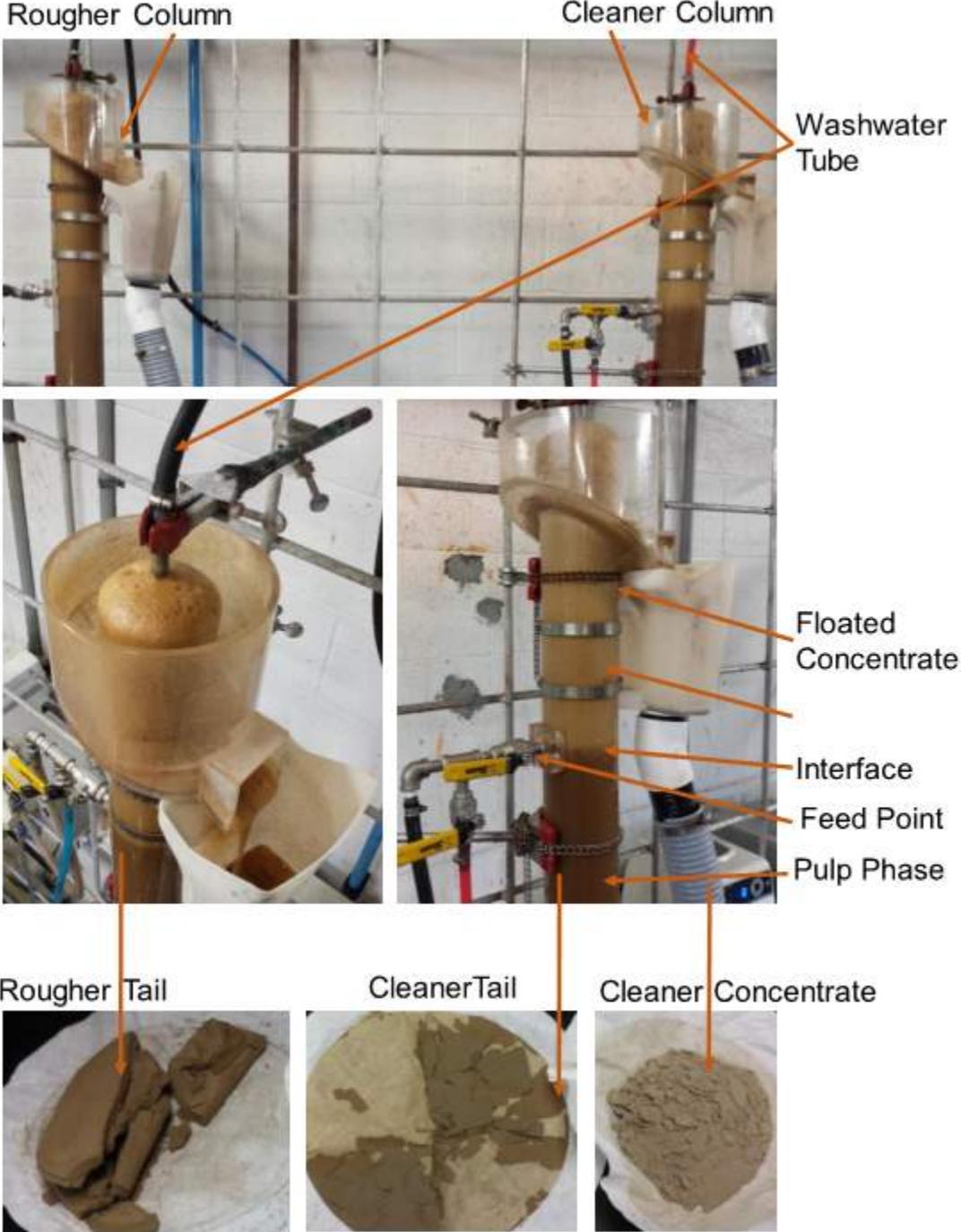


Figure 13.2 Details of Saprolite Flotation Circuit



Continuous operation of a fully automated, two-stage column flotation circuit yielded phosphate (P<sub>2</sub>O<sub>5</sub>) recoveries ranging from 85% to 90% at an average final product grade of nearly 32.7% P<sub>2</sub>O<sub>5</sub>.

Following flotation, magnetic separation testing was performed to determine the impact on reducing the MER (or (MgO + Al<sub>2</sub>O<sub>3</sub> + Fe<sub>2</sub>O<sub>3</sub>)/ P<sub>2</sub>O<sub>5</sub>). It was found that subsequent medium and high wet magnetic separations (MIMS / WHIMS) improved the rougher-cleaner flotation concentrate grade from approximately 32.7% to 34.9% P<sub>2</sub>O<sub>5</sub>, and the MER was decreased from 0.2 to 0.06. In addition, after application of MIMS and WHIMS, the P<sub>2</sub>O<sub>5</sub> recovery was even higher at over 99%, with an overall global phosphate recovery (after flotation and magnetic separation) conservatively estimated at approximately 87% (see Table 13.11, below). Approximately 50kg of final concentrate was produced for further characterization studies.

Details of the saprolite flotation results are summarized in the table below.

**Table 13.12 Saprolite - Rougher / Cleaner and Magnetic Separation Results**

Test	Stage	Stream	Mass-Balanced Assays						Grade, Yield & Recovery			
			P <sub>2</sub> O <sub>5</sub>	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	CaO	MER	Concentrate		Re.
			(%)	(%)	(%)	(%)	(%)	(%)		P <sub>2</sub> O <sub>5</sub> (%)	Yield(%)	
BulkRun	Column Rougher	Ro. Overflow	30.13	1.08	0.78	6.26	7.57	42.79	0.31	30.13	29.78	90.1
		Ro. Underflow	1.41	8.4	7.9	41.66	20.69	42.79				
		Ro. Feed	9.96	6.22	5.78	31.12	16.78	15.27	2.89			
	Column Cleaner	Cleaner OF	32.72	0.59	0.38	3.48	5.72	46.27	0.20	32.72	90.97	96.8
		Cleaner UF	4.02	6.01	4.82	34.18	26.22	7.69				
		Cleaner Feed	30.13	1.08	0.78	6.26	7.57	42.79	0.31			
	Combined Rougher Cleaner	Cleaner OF	32.72	0.59	0.38	3.48	5.72	46.27	0.2	32.72	27.09	89
		Ro.&Cl.UF	1.50	8.31	7.79	41.38	20.89	3.76				
		Rougher Feed	9.96	6.22	5.78	31.12	16.78	15.27	2.89			
	MIMS 6.100 Gauss	Non-Mag	33.93	0.59	0.37	3.52	2.57	47.95	0.10	33.93	96.08	99.7
		Mag	2.9	0.56	0.68	2.59	83.83	5.1				
		Feed	32.72	0.59	0.38	3.49	5.71	46.27	0.20			
	WHIMS 14.000 Gauss	Non-Mag	34.92	0.5	0.33	3.22	1.31	49.36	0.06	34.92	96.61	99.4
		Mag	5.79	3.27	1.53	12.42	38.22	8.08				
		Feed	33.93	0.59	0.37	3.53	2.56	47.96	0.10			
Circuit	Ro.-Cl MIMS-WHIMS Circuit	Final Conc.	34.92	0.50	0.33	3.22	1.31	49.36	0.06	34.92	25.15	88.2
		Tails & Mag	1.57	8.14	7.61	40.49	21.97	3.83				
		Feed	9.96	6.22	5.78	31.12	16.78	15.27	2.89			

A detailed description of the test work performed with saprolite is given in the report “SAN 20603 - MTR 17-041 – Final Report Phase III: Saprolite Flotation and Magnetic Separation” (Eriez, 2017).

### 13.3.2.3 FRESH CARBONATITE TESTING

For fresh carbonatite, the primary requirement of the test program was to confirm or re-define global phosphate grades and recoveries determined in the preceding open circuit test program (2016 ‘bench-scale’ campaign) using a closed rougher-cleaner-cleaner-scavenger flotation circuit (i.e. incorporating recirculating loads). In addition, continuous column flotation testing was utilized to generate bulk concentrate and tailings samples for subsequent characterization studies.

Of approximately 1.9 tons of MCBT sample received, after crushing and setting aside of a ‘reserve’ sample for future testing, Eriez split 1.5 tons of the sample for testing. After crushing both sample forms were independently crushed, classified and milled to nearly 95% passing 212 µm (half-core and the crushed core reject forms were handled separately to ensure that flotation performance testing was not compromised).

A grinding study was performed to determine how best to obtain a mill product of P95 at 212 µm. The results of this study were then used as the basis to determine the approach to milling for the sample program. Following crushing, the fresh carbonatite ore was wet classified at 212 µm. The plus 212 µm screen oversize was milled to a P95 of 212 µm. After milling was complete, the milled products were combined and then blended back with the existing minus 212 µm fraction produced during wet classification to form sample slurries (30% solids, by weight) for testing.

The tables below show the particle size and phosphate distribution of the ground ore used for flotation tests, by sample type.

**Table 13.13 Fresh Feed (Whole Core) - Particle Size and Phosphate Distribution**

Screen Size (µm)	Weight (%)	Cum. % Passing	% P <sub>2</sub> O <sub>5</sub>	P <sub>2</sub> O <sub>5</sub> Dist.
+150	22.0	100.0	1.7	11.4
150x106	13.1	78.0	2.3	8.9
106x75	14.2	65.0	3.1	13.1
75x53	11.4	50.8	4.1	13.9
53x25	12.7	39.4	5.1	19.4
-25	26.6	26.6	4.2	33.3
<b>Cumulative</b>	<b>100.0</b>		<b>3.4</b>	<b>100.0</b>

**Table 13.14 Fresh Feed (Core Rejects) - Particle Size and Phosphate Distribution**

Screen Size (µm)	Weight (%)	Cum. % Passing	% P <sub>2</sub> O <sub>5</sub>	P <sub>2</sub> O <sub>5</sub> Dist.
+150	22.0	100.0	1.7	14.9
150x106	13.1	69.4	2.6	11.8
106x75	14.2	53.5	4	16
75x53	11.4	39.6	5.8	11.4
53x25	12.7	32.7	6.1	21
-25	26.6	20.7	4.2	24.9
Cumulative	100.0		3.5	100

Continuous operation of a fully automated, four-stage column flotation circuit (see Figure 13.3, below) yielded P<sub>2</sub>O<sub>5</sub> recoveries ranging from 71% to 80%, at an average final product grade of nearly 31% P<sub>2</sub>O<sub>5</sub>.

Phosphate recovery and grade were determined to be highly dependent upon the feed size distribution and head grade. Optimal flotation performances were achieved when processing coarser size or a higher feed grade. For example, from a 3.6% P<sub>2</sub>O<sub>5</sub> feed bearing a P50 of 106 micron (µm), a 30% P<sub>2</sub>O<sub>5</sub> concentrate was achieved at a circuit P<sub>2</sub>O<sub>5</sub> recovery of 79%. Upon a decrease in feed P50 to 75 µm, the global phosphate recovery decreased to 71% - 76% under a majority of steady state operating conditions. Additionally, when treating a P50 of 75 µm feed bearing a 4.1% P<sub>2</sub>O<sub>5</sub> head grade, global phosphate recovery improved to approximately 80% at a 29% P<sub>2</sub>O<sub>5</sub> head grade.

**Figure 13.3 Four-Stage Column Flotation Circuit**



Table 13.14, below, details the mass balanced circuit results ascertained during continuous operation of the rougher-cleaner-cleaner-scavenger column flotation circuit. Final circuit P<sub>2</sub>O<sub>5</sub> recoveries and grades varied, as a result of variations in feed size distribution, head grade, and operating parameters.

**Table 13.15 Flotation Results Summary – Fresh Carbonatite**

Test	Feed					Float					Non-Float					Float	P <sub>2</sub> O <sub>5</sub>
No.	% P <sub>2</sub> O <sub>5</sub>	% MgO	% SiO <sub>2</sub>	% Fe <sub>2</sub> O <sub>3</sub>	% CaO	% P <sub>2</sub> O <sub>5</sub>	% MgO	% SiO <sub>2</sub>	% Fe <sub>2</sub> O <sub>3</sub>	% CaO	% P <sub>2</sub> O <sub>5</sub>	% MgO	% SiO <sub>2</sub>	% Fe <sub>2</sub> O <sub>3</sub>	% CaO	Yield (%)	Recovery (%)
22	3.75	5.55	7.83	3.62	41.52	28.74	3.8	5.1	1.9	47.9	0.87	5.75	8.15	3.82	40.78	10.3	79.1
23	3.69	5.4	7.65	3.81	41.67	31.26	3.1	4.2	2	48.49	0.92	5.63	8	3.99	40.98	9.1	77.3
24	3.6	5.21	7.46	4.61	41.63	30.02	3.4	4.5	2.7	47.6	0.87	5.4	7.77	4.81	41.01	9.4	78.2
25	3.59	5.27	7.47	3.8	41.53	30.22	3.5	4.5	2.7	47.4	0.84	5.45	7.78	3.92	40.93	9.4	78.7
29	3.61	5.98	8.27	4.2	40.38	29.44	4.1	5.3	2.6	44.6	1.17	6.16	8.55	4.35	39.98	8.6	70.4
33	3.91	6.36	8.61	4.27	41.2	30.87	3.6	4.5	2	46.68	1.27	6.64	9.02	4.49	40.66	8.9	70.4
34	3.63	6.15	7.42	4.39	41.39	29.46	4	4.6	2.4	45.8	1.14	6.38	7.7	4.58	40.97	8.8	71.3
35	3.69	5.95	7.95	4.57	40.61	29.11	4.2	4.8	2.8	44.59	1.06	6.13	8.28	4.75	40.2	9.4	73.9
36	3.59	5.5	6.3	3.35	43.15	29.06	4.11	4.91	2.61	46.31	1.12	5.83	6.43	3.42	42.85	8.8	71.5
37	3.18	6.17	8.29	3.96	40.4	29.4	4.2	4.8	2.5	46.9	1.02	6.33	8.57	4.08	39.87	7.6	70.4
38	3.37	6.08	8.62	5.09	40.29	27.38	4.4	5	3	45.6	1.04	6.25	8.97	5.3	39.78	8.9	71.9
39	3.56	5.88	8.28	6.14	40.2	28.16	4.3	5.1	3.1	45.5	1.05	6.04	8.61	6.45	39.66	9.3	73.3
40	4.27	5.68	8.22	4.49	41.05	28.13	4.3	5.1	3.7	45.69	0.84	5.88	8.67	4.6	40.38	12.6	82.8
41	4.12	5.84	8.1	4.65	40.99	28.82	4.1	4.9	3.31	45.87	0.95	6.06	8.51	4.82	40.36	11.4	79.6
43	4.12	5.84	8.1	4.65	40.99	28.82	4.1	4.9	3.31	45.87	0.95	6.06	8.51	4.82	40.36	11.4	79.6
46	3.73	6.11	8.3	4.65	40.81	32.81	2.8	4.1	2.3	47	1.16	6.41	8.68	4.85	40.26	8.1	71.4
53	3.72	6.05	8.31	4.05	40.29	31.34	3.4	4.8	3.2	45.6	0.98	6.31	8.66	4.14	39.76	9	76
54	3.61	6.12	8.48	4.18	39.77	31.47	3.3	4.7	3.1	46.1	1.16	6.36	8.81	4.27	39.22	8.1	70.3
55	3.75	6.07	8.33	4.52	40.07	30.1	3.8	4.9	3.1	46.1	1.09	6.3	8.68	4.66	39.47	9.2	73.7
56	4.04	6.15	8.15	4.22	40.8	29.06	3.8	4.7	3.2	45.92	1.09	6.42	8.56	4.34	40.2	10.5	75.8

Given the inherent characteristics of the laboratory-scale pilot equipment, recirculation of the tailings was not applied within the program. However, data from the continuous flotation test period was employed to simulate the inclusion of the tailings recirculating load in a cleaner circuit. On average, recirculation of the tailings will provide up to a 2.5% increase in phosphate (P<sub>2</sub>O<sub>5</sub>) recovery at a 30% P<sub>2</sub>O<sub>5</sub> final concentrate grade. The increase in recovery is also highly dependent upon the circuit feed grade and size distribution.

Following the production of a bulk phosphate flotation concentrate, magnetic separation tests were performed to reduce the MER of the final concentrate product. Upon application of medium and high intensity magnetic separation, the flotation concentrate was improved from to approximately 31 to 33% P<sub>2</sub>O<sub>5</sub> as the minor element ratio was

decreased from 0.21 to 0.14. The P<sub>2</sub>O<sub>5</sub> recovery at WHIMS was higher than 99%. The following table summarizes the results of magnetic separation.

**Table 13.16 Magnetic Separation Results Summary – Fresh Carbonatite**

Description	Mass (%)	Assay						Recovery	Total Rec.	MER	CaO/P <sub>2</sub> O <sub>5</sub>
		P <sub>2</sub> O <sub>5</sub>	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	CaO				
		(%)	(%)	(%)	(%)	(%)	(%)	%P <sub>2</sub> O <sub>5</sub>	%P <sub>2</sub> O <sub>5</sub>		
Bulk Core MIMS Calculated Feed	100.0	31.1	3.5	0.7	4.5	2.3	48.3	-	99.2	0.21	1.6
Bulk Core MIMS Mag	0.5	5.8	3.1	0.9	5.4	53.5	8.1	0.1		9.91	1.4
Bulk Core MIMS Non Mag	99.5	31.2	3.5	0.7	4.5	2.1	48.5	99.9		0.20	1.6
Bulk Core WHIMS Mag 1	3.7	6.6	11.0	1.9	12.0	9.2	32.0	0.7		3.35	4.8
Bulk Core WHIMS Non Mag 1	96.3	33.7	2.6	0.3	3.5	1.7	48.5	99.3		0.14	1.4

As previously stated, phosphate recovery and concentrate grade are dependent upon the feed size distribution and head grade, and optimal flotation performances that are achieved when processing coarser and/or higher-grade feeds.

Given the inherent characteristics of the laboratory-scale pilot test, some overgrinding has occurred which can easily be avoided in an industrial scale grinding circuit by using a two-stage grinding circuit (rod and ball mills) with pre-classification before the 2<sup>nd</sup> grinding circuit. Also, the final resource evaluation allows a selection of a higher cut-off grade and the average feed grade would be around 4.0 % P<sub>2</sub>O<sub>5</sub>, which would favor an increased recovery.

Finally, the industrial circuit was sized and designed with three cleaner stages. This circuit configuration would provide a more stable operation and ultimately would favor recovery. The results from this extensive pilot-scale program indicate that a global phosphate recovery of 80% producing concentrate grading 32% P<sub>2</sub>O<sub>5</sub> is achievable at an industrial scale.

A detailed description of the test work performed and corresponding results is given in the report “SAN 20603 MTR 17-041 - Final Report – Phase I – Rev. 2 Fresh Carbonatite Pilot Phosphate Flotation” (Eriez, 2017).

#### **13.3.2.4 AMPHIBOLITE TESTING**

Laboratory-scale, batch, mechanical flotation tests were performed on samples of fresh amphibolite (MAMP) and saprolite of amphibolites (AMPSAP) phosphate ores. As with the fresh and saprolitic carbonatites, samples were gathered in order to ensure adequate geospatial representation.

Of the sample provided, (731kg of MAMP and 469kg of AMPSAP) Eriez split approximately 200kg and 135kg of MAMP and AMSAP sample, respectively. Samples were classified and wet-screened before being homogenized and split to form representative samples in the form of a slurry (25% solids, by weight). In accordance with the sample preparation procedure for saprolitic material, the coarser screen overflow from the AMPSAP sample preparation was not used in testing.

Laboratory-scale, batch, mechanical flotation testing of the ore samples was first performed using the fresh carbonatite reagent scheme and a multi-stage mechanical flotation circuit (rougher-cleaner-cleaner) as indicated by testing of the carbonatite in the earlier phase of the program. Additionally, mechanical flotation tests were performed using various collectors. For AMPSAP, inclusion of a 3<sup>rd</sup> cleaner in the circuit was also tested.

Laboratory-scale bench-top flotation testing was performed with the use of mechanical ‘Denver’ cells, as shown in Figure 13.4 below.

Figure 13.4 'Bench-top' Flotation Apparatus



The following photos show the rougher flotation of fresh amphibolites (MAMP) and saprolite of amphibolites (AMPSAP), respectively.

Figure 13.5 Fresh Amphibolite (MAMP) Rougher Flotation

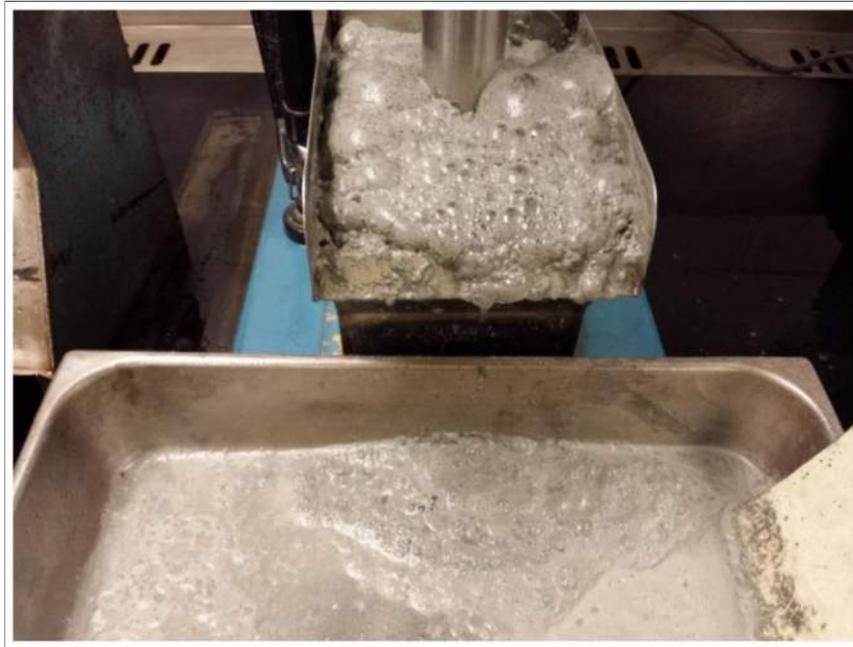


Figure 13.6 Saprolite of Amphibolite (AMPSAP) Rougher Flotation



Figure 13.7 illustrates the impact of the cleaner stages of concentration; of significance is the color of the rougher tails (on the left) and the third cleaner concentrate (on right).

**Figure 13.7 (AMPSAP) Rougher Tails vs 3rd Cleaner Concentrate**



Various operational conditions were tested and Figures 13.8 and 13.9 indicate the relationship of concentrate grade vs recovery for different types of collectors for both the fresh amphibolite and saprolite of amphibolite.

For amphibolites, using a rougher-cleaner-cleaner circuit configuration, a flotation concentrate grade of 30.4% P<sub>2</sub>O<sub>5</sub> was achieved at a 77.5% P<sub>2</sub>O<sub>5</sub> recovery.

**Figure 13.8 MAMP Grade vs Recovery Relationship by Collector Type**

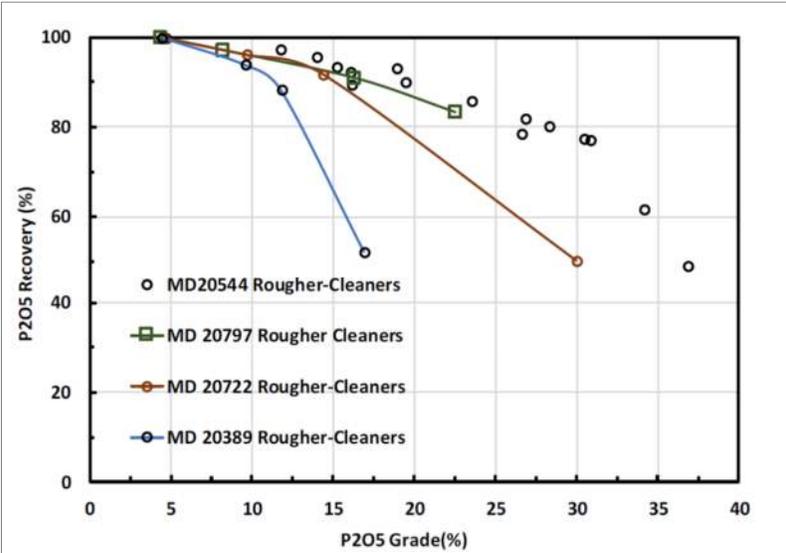
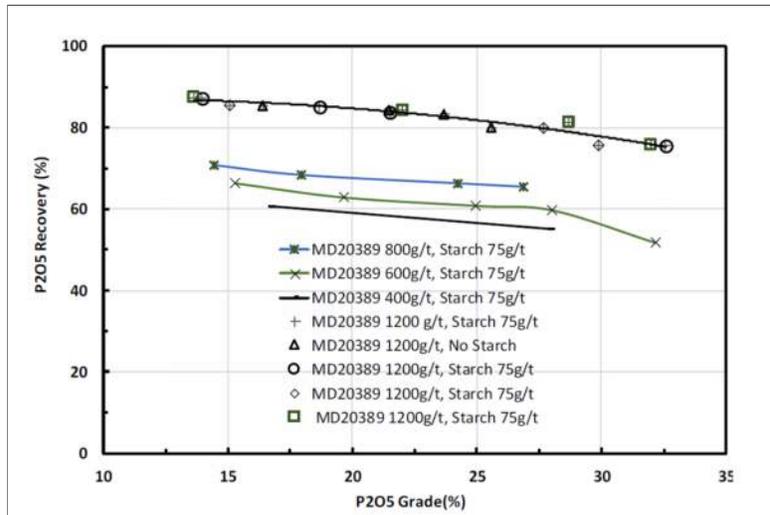


Figure 13.9 AMPSAP Grade vs Recovery Relationship by Collector Type



Using a rougher-cleaner-cleaner circuit configuration, a 30-32% P<sub>2</sub>O<sub>5</sub> concentrate was achieved at a 75-76% P<sub>2</sub>O<sub>5</sub> recovery for sapolite of amphibolites. In addition, it is noted that that this testing accounted only for bench-top flotation performance and does not reflect the potential performance of column flotation. A significant improvement of concentrate grade and recovery was noted in sapolite of carbonatite (CBTSAP) when comparing the results of mechanical cell and column flotation.

Based on the results above, it was demonstrated that a viable P<sub>2</sub>O<sub>5</sub> concentrate can be produced from amphibolite ores at recovery levels compatible to an open circuit with mechanical cells. Considering that the proportion of amphibolites (MAMP and AMPSAP) in the deposit is approximately 7%, the presence of amphibolites as a dilutant in the carbonatite-predominant feed is not expected to have a significant adverse on flotation performance.

It is important to note that laboratory-scale, 'bench-top' testing of the amphibolites indicates the flotation response of these ore types and is not intended to reflect expected flotation performance (concentrate grades, recovery) at an industrial scale. Steady-state column flotation tests must be conducted and further reagent screening tests performed, before verifying potential improvements in product grade and recovery.

## **14 MINERAL RESOURCE ESTIMATES**

### **14.1 INTRODUCTION**

This section presents the mineral resource estimates determined by Aguia and audited by Millcreek. Millcreek has reviewed the methodology and assumptions used by Aguia and has completed a detailed audit of the geologic model and resource estimation. The mineral resource model prepared by Aguia for Três Estradas considers 139 core holes and 244 RC holes drilled during the period of October 2011 to June 2017. Sampling information from auger holes are not considered in the model.

### **14.2 RESOURCE DATABASE**

The database used for mineral resource evaluation includes 139 core holes (20,509.5m) and 244 RC holes (7,800m) for the Três Estradas deposit (Table 14.1). The database was provided to Millcreek in a digital format and represents the Três Estradas Project exploration dataset as of August 8, 2017.

All drill hole collars were surveyed using differential GPS equipment in UTM coordinates (SAD69 datum, Zone 21S). Down-hole surveys were initiated in the second drilling campaign. In all, 96 core holes, representing 69% of the core drilled have been surveyed at three-meter intervals using a Maxibore tool. Core recovery exceeded 90% in 97% in all core holes. All RC holes have vertical orientations and have relatively shallow depths and are likely to have insignificant down-hole deviations.

**Table 14.1 Summary of Drilling Database**

<b>Drilling</b>	<b>Count</b>	<b>Cumulative Meters</b>	<b>Assay Intervals</b>
Core Holes	139	20,509.5	16,046
RC Holes	244	7,800.0	7,800
<b>Total</b>	<b>383</b>	<b>28,309.5</b>	<b>23,846</b>

Millcreek has completed a thorough review and verification of the drilling database and found the database to be sufficient for resource modeling.

### 14.3 GEOLOGIC MODEL

Agua has developed a geologic block model of the Três Estradas Property phosphate deposit using GEMS™ software. Modeling was constructed by developing a series of vertical sections spaced at 50m intervals. Three-dimensional shells were developed by linking the vertical sections together with tie lines. Mineralization has an approximate strike length of 2,400m and extends to a depth of 370m below surface. Mineralized zones range in thickness from 5m to 100m. The outer mineralized envelopes were modeled into wireframe solids using a 3.00% P<sub>2</sub>O<sub>5</sub> cut-off grade.

The model recognizes five mineralized, lithologic domains and nine non-mineralized domains as listed in Table 14.2.

**Table 14.2 Model Lithologic Domains**

Typology	Domain	Average Ordinary Kriging Density	Block Model Code	Description
MINERALIZED	CBTSAP	1.60	120	Saprolite of Carbonatite
	WMCBT	2.80	110	Weathered Carbonatite
	MCBT	2.85	100	Meta-Carbonatite
	AMPSAP	1.65	220	Saprolite of Amphibolite
	MAMP	2.87	200	Amphibolite
WASTE	AMPSAP-WASTE	1.77	22	Saprolite of Amphibolite Waste
	WMAMP-WASTE	2.83	21	Weathered Amphibolite Waste
	MAMP-WASTE	2.91	20	Amphibolite Waste
	W-SAP	1.81	32	Saprolite Waste (Meta-Syenite, Gneiss)
	W-WEATH	2.59	31	Weathered Waste (Meta-Syenite, Gneiss)
	W-ROCK	2.68	30	Fresh Rock Waste (Meta-Syenite, Gneiss)
	CBTSAP-WASTE	1.63	42	Saprolite of Carbonatite Waste
	WMCBT-WASTE	2.76	41	Weathered Carbonatite Waste
MCBT-WASTE	2.80	40	Meta-Carbonatite Waste	

Agua constructed wireframes of the meta-carbonatite and the amphibolite. Meta-carbonatite is differentiated by weathering into three domains: saprolite, weathered carbonatite, and fresh meta-carbonatite. Amphibolite is separated into two domains: saprolite and fresh amphibolite.

Grade estimations were made using ordinary kriging interpolation for all of the mineralized domains. All assays were composited to 1.0m lengths. All estimations are based on a homogeneous block model. Dimensions of the block model are displayed in Table 14.3.

**Table 14.3 Block Model Dimensions**

Dimensions	Minimum	Maximum	Block Size	Number of blocks
X	766,350	769,110	12	230
Y	6,575,650	6,576,820	6	195
Z	-100	400	10	50
Rotation	40°			

Figure 14.1 presents a perspective view of the modeled 3D solids and surfaces of the model.

**Statistical Analysis, Compositing and Capping**

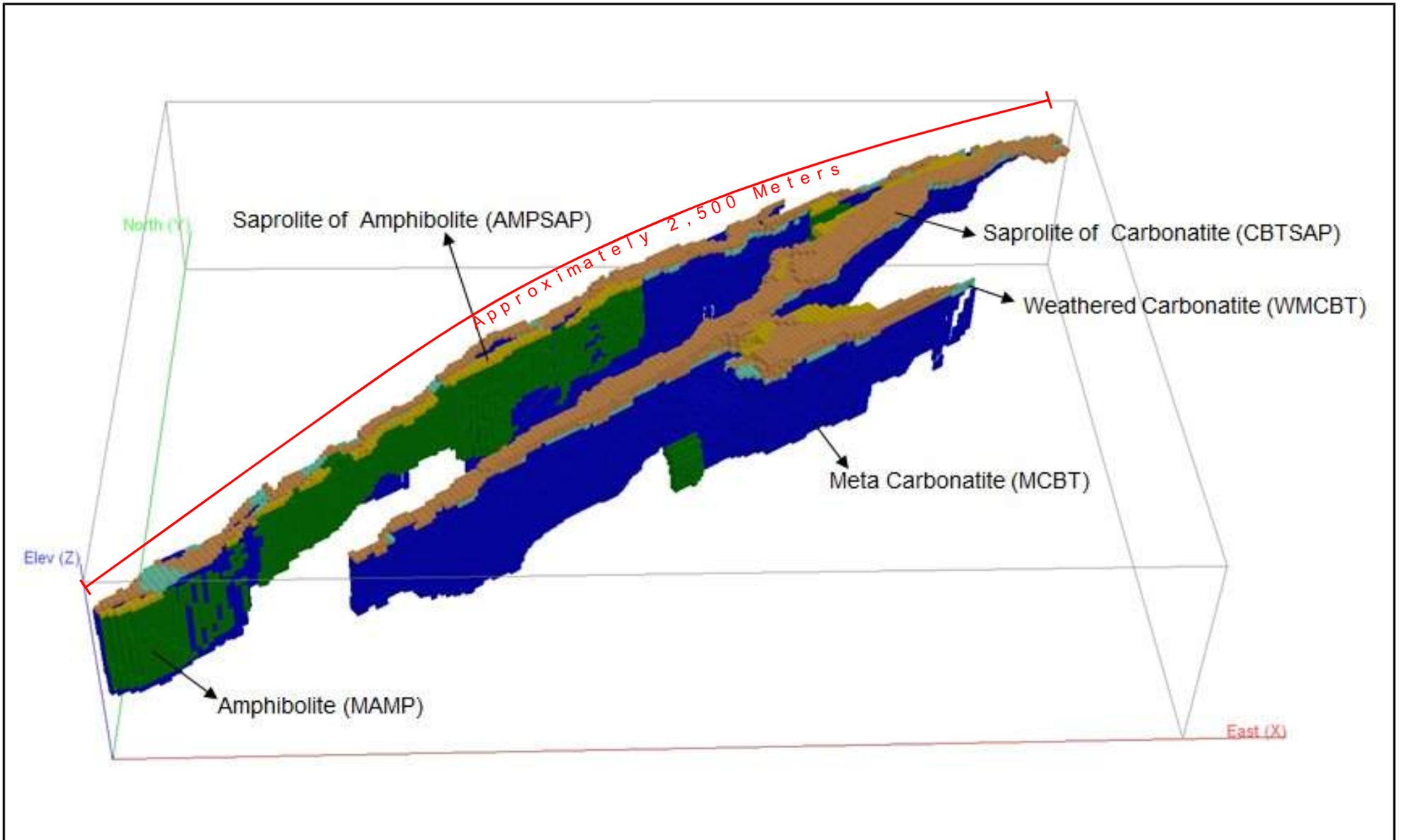
Millcreek reviewed the statistics for assay samples in the five mineralized domains. There are sufficient samples in each domain to support resource estimation. Table 14.4 presents the length-weighted averages and summary statistics for each of the six oxides within the five mineralized domains.

**Table 14.4 Summary Statistics of Oxide Grades for Mineralized Domains**

Domain	Rock Code	Stats*	P <sub>2</sub> O <sub>5</sub>	CaO	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	MgO	SiO <sub>2</sub>
AMPSAP	210	Average	5.22	10.75	8.44	15.21	7.42	40.67
		Std. Dev.	2.99	4.48	3.18	2.90	3.28	8.87
		Minimum	0.16	0.44	2.24	6.28	0.24	22.60
		Maximum	15.10	24.50	21.20	24.90	14.60	81.30
		Count	447					
CBTSAP	110	Average	9.67	16.57	5.60	18.45	4.80	31.32
		Std. Dev.	5.29	8.36	3.17	6.66	3.43	11.77
		Minimum	0.00	0.00	0.00	0.00	0.00	0.00
		Maximum	36.90	49.30	19.70	73.40	15.50	96.60
		Count	2122					
WMCBT	120	Average	4.49	34.82	2.26	9.02	5.89	13.87
		Std. Dev.	2.08	8.74	2.00	3.75	2.86	8.80
		Minimum	0.99	5.17	0.09	2.57	0.76	1.34
		Maximum	19.00	50.90	14.74	39.80	16.60	79.10
		Count	993					
MCBT	100	Average	3.79	34.31	2.10	7.95	7.71	11.94
		Std. Dev.	1.33	7.85	2.12	2.81	3.20	8.65
		Minimum	0.00	0.00	0.00	0.00	0.00	0.00
		Maximum	19.00	52.40	20.20	67.10	17.50	98.50
		Count	8743					
MAMP	200	Average	3.81	19.49	6.75	12.60	9.04	33.31
		Std. Dev.	1.55	4.25	1.62	2.57	1.52	6.94
		Minimum	0.03	0.14	0.00	1.45	0.10	2.44
		Maximum	11.77	43.00	13.40	22.10	16.70	97.60
		Count	670					

\*Length-weighted averages

Agua has composited all assay intervals for the five domains to 1.0m lengths. Figure 14.2 shows the cumulative distribution of assay sample lengths. The cumulative frequency plot shows that 91% of all mineralized samples have a sample length less than or equal to 1.0m and approximately 76% of the samples are 1.0m in length. Millcreek considers the 1.0m composite length to be an appropriate length for sample composites. Table 14.5 presents the length-weighted averages and summary statistics for each of the six oxides within the five mineralized domains following compositing.



- Saprolite of Carbonatite (CBTSAP)
- Saprolite of Amphibolite (AMPSAP)
- Weathered Meta-Carbonatite (WMCBT)
- Meta-Carbonatite (MCBT)
- Amphibolite (MAMP)

FIGURE 14.1

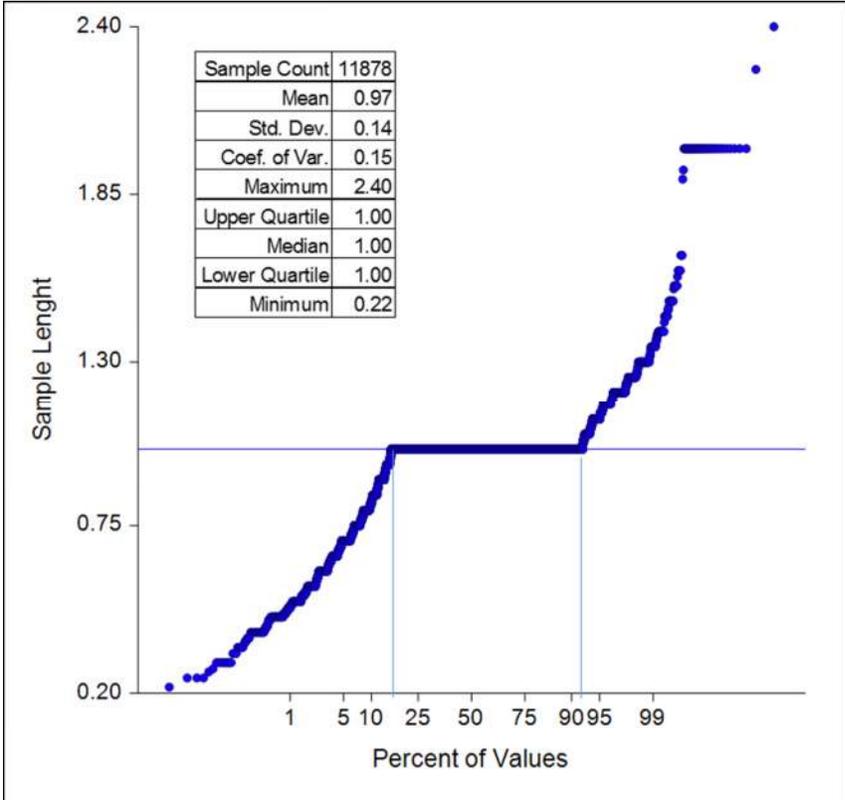
Perspective View of Modeled  
3D Solids from Três Estradas  
Block Model

DATE: 10/19/2017

BY: *Tom S. Hays*

Millcreek Mining  
GROUP

Figure 14.2 Sample Length Probability



**Table 14.5 Summary Statistics\* of Composite Grades for Mineralized Domains**

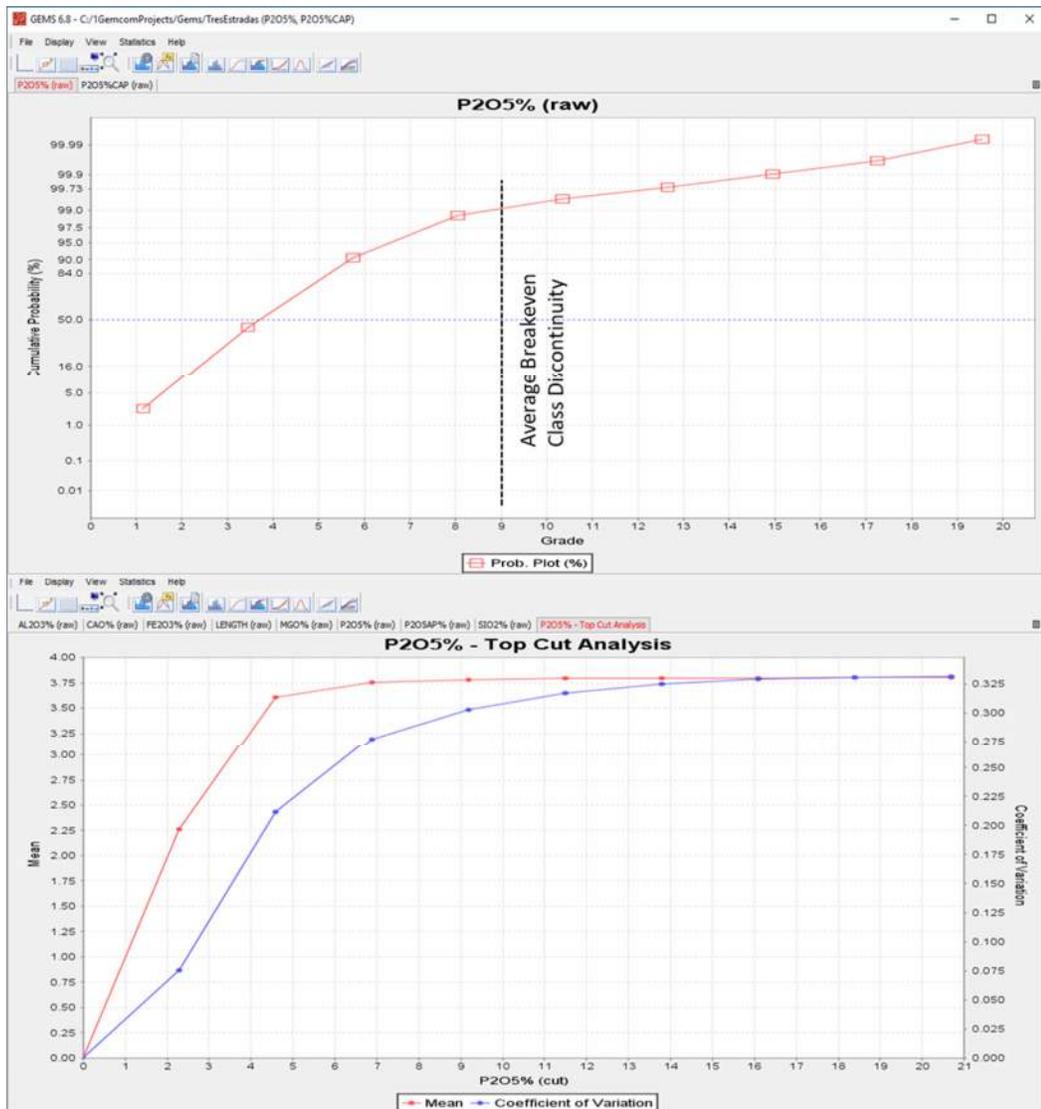
CBTSAP	Rock Code	Stats*	P <sub>2</sub> O <sub>5</sub>	CaO	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	MgO	SiO <sub>2</sub>
AMPSAP	210	Average	5.24	10.78	8.45	15.25	7.41	40.57
		Std. Dev.	2.95	4.44	3.14	2.87	3.27	8.68
		Minimum	0.19	0.44	2.24	6.28	0.24	22.60
		Maximum	15.10	24.50	21.20	24.90	14.60	81.30
		Count	449					
CBTSAP	110	Average	9.67	16.58	5.62	18.45	4.80	31.29
		Std. Dev.	5.22	8.29	3.16	6.62	3.40	11.53
		Minimum	0.00	0.00	0.00	0.00	0.00	0.00
		Maximum	29.81	49.30	19.70	73.40	15.50	90.20
		Count	2,120					
WMCBT	120	Average	4.49	34.82	2.26	9.02	5.89	13.87
		Std. Dev.	2.08	8.74	2.00	3.75	2.86	8.80
		Minimum	0.99	5.17	0.09	2.57	0.76	1.34
		Maximum	19.00	50.90	14.74	39.80	16.60	79.10
		Count	993					
MCBT	100	Average	3.80	34.43	2.07	7.95	7.70	11.79
		Std. Dev.	1.26	7.28	1.97	2.60	3.08	7.66
		Minimum	0.00	0.00	0.00	0.00	0.00	0.00
		Maximum	19.00	50.92	20.05	56.60	17.50	83.47
		Count	8,540					
MAMP	200	Average	3.81	19.41	6.75	12.73	9.03	33.49
		Std. Dev.	1.47	3.72	1.45	2.47	1.38	6.06
		Minimum	0.03	0.14	0.10	1.45	0.10	5.04
		Maximum	11.77	43.00	43.00	22.10	16.00	97.60
		Count	709					

\*Length-weighted averages

Agua has not employed any grade capping to limit the influence of high-grade outliers. Rather a high-grade limit was applied to reduce the influence of the high-grade values. Under supervision of Millcreek, Agua conducted a top-cut analysis. Through visual inspection of the gradual changes of the mean values, a high-grade limit was identified for each mineral domain. Figure 14.3 shows 9% P<sub>2</sub>O<sub>5</sub> was selected as the high-grade limit. Therefore, in the grade estimation process of P<sub>2</sub>O<sub>5</sub>, when the composite grade reaches 9% or more the size of search ellipsoids reduces to half of its original size. This approach has two main benefits:

- i. Compared to the grade capping process<sup>5</sup>, the high-grade composites will have some effect on estimation, therefore comparable proportions of blocks will be estimated with high grade values.
- ii. The smearing effect of the high grades composites were reduced hence reducing the effect of 'conditional bias'.

**Figure 14.3 The Top Cut Process for P<sub>2</sub>O<sub>5</sub>**



<sup>5</sup> In the capping process the high-grade composites are trimmed to the capping grade and hence blocks will be estimated with grades lower than the capping grade.

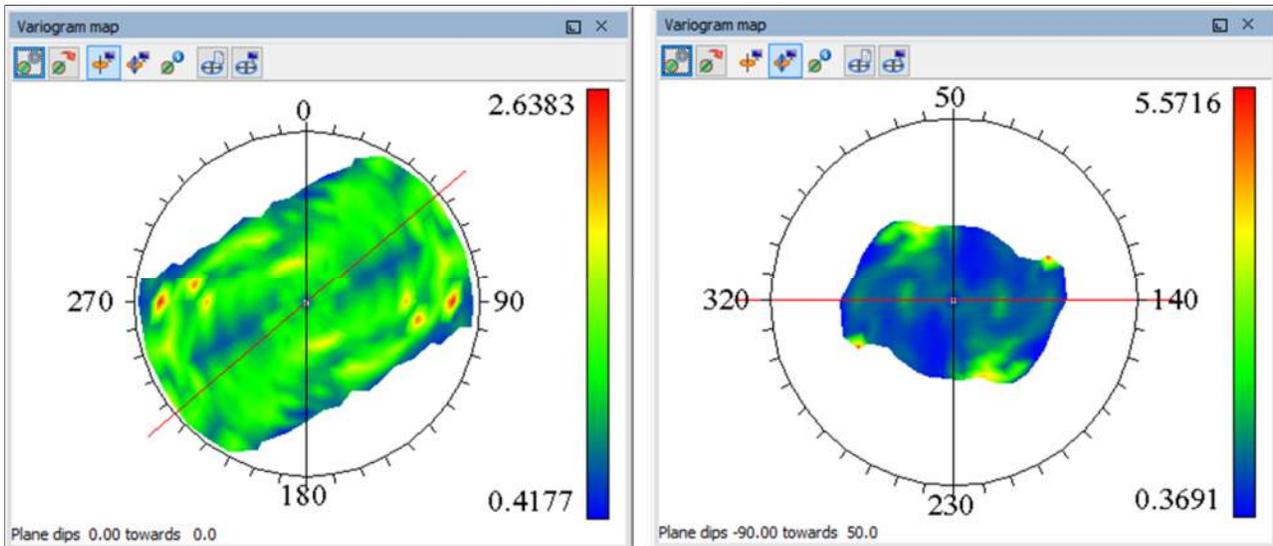
**Variography**

Agua performed a series of variograms and variogram maps in GEMS mining software to model the spatial continuity of the six oxides (P<sub>2</sub>O<sub>5</sub>, CaO, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, MgO, and SiO<sub>2</sub>) and for specific gravity of MCBT and MAMP. Figure 14.4 is an example of a variogram map for P<sub>2</sub>O<sub>5</sub> for meta-carbonatite. Search ellipsoids and different orientations for strike, dip and plunge were evaluated using variogram maps. The test results of the normalized anisotropic variograms are presented in the Table 14.7. The variography studies were performed using the composites in the meta-carbonatite (MCBT). Variography shows a preference in orientation that is nearly coincidental to the strike and dip of the meta-carbonatite and the Cerro dos Cabritos Fault. The variograms were normalized before running the resource estimation. Additionally, in order to improve the quality of estimation, variograms for specific gravity were modeled for meta-carbonatite and amphibolite. The parameters of the normalized omnidirectional variograms of SG are also shown in the table 14.6.

**Table 14.6 Normalized Variogram Parameters Used in the Grade Estimation Process**

Domain	Variable	GEMS Rotation (ADA)			Variogram Model						
		Azimuth	Dip	Azimuth	Nugget	Str. No.	Type	CC	Y Range (width)	X Range (strike)	Z Range (vertical)
MCBT	P2O5%	50	0	140	0.1	1	spherical	0.50	15	100	5
		50	0	140		2	spherical	0.40	35	160	45
MCBT	CAO%	50	0	140	0.25	1	spherical	0.40	15	80	7
		50	0	140		2	spherical	0.35	30	170	36
MCBT	MGO%	50	0	140	0.1	1	spherical	0.30	15	95	7
		50	0	140		2	spherical	0.60	40	180	50
MCBT	FE2O3%	50	0	140	0.25	1	spherical	0.35	40	35	3
		50	0	140		2	spherical	0.40	55	70	11
MCBT	SIO2	50	0	140	0.1	1	spherical	0.55	25	60	3.5
		50	0	140		2	spherical	0.35	25	110	12
MCBT	AL2O3	50	0	140	0.25	1	spherical	0.40	30	95	6
		50	0	140		2	spherical	0.35	40	150	25
Domain	Variable	GEMS Rotation (ADA)			Variogram Model						
		Azimuth	Dip	Azimuth	Nugget	Str. No.	Type	CC	Y Range (width)	X Range (strike)	Z Range (vertical)
MCBT	S.G.	0	0	0	0	1	spherical	0.50	110	110	110
		0	0	0		2	spherical	0.50	190	190	190
MAMP	S.G.	0	0	0	0.1	1	spherical	0.20	45	45	45
		0	0	0		2	spherical	0.70	225	225	225

Figure 14.4 Variogram Map for P<sub>2</sub>O<sub>5</sub> Grade in MCBT



#### Density and Grade Estimation

The estimation for the six oxide variables (P<sub>2</sub>O<sub>5</sub>, CaO, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, MgO, and SiO<sub>2</sub>) and specific gravity were done using ordinary kriging interpolation for all the domains: MCBT, WMCBT, MAMP, CBTSAP and AMPSAP. All estimations are based on 1.0m composites on a homogeneous block model with unitary dimensions of 12m N, by 6m E, and 10m in elevation rotated 40° in a clock-wise direction. Three estimation passes were used with progressively relaxed search ellipsoids and data requirements based on the Variography.

- Pass 1: Blocks estimated in the first pass using half the distance of variogram range and based on composites from a minimum of three boreholes;
- Pass 2: Blocks estimated in the first two passes within the full range of the variogram and based on composites from a minimum of two boreholes; and
- Pass 3: All remaining blocks within the wireframe limits in an unconfined search not classified in the first two estimation passes.

Table 14.7 shows the search parameters used for each mineralized domain and Table 14.8 shows the search parameters employed for specific gravity.

**Table 14.7 Search Parameters for Grade Estimation**

Domain	Estimation Run	Search Ellipse									Search Type	HG Transition Search						
		Composites			SVx*			SVy*				SVz*			High Grade (HG) Transition Value	SVx* (m)	SVy* (m)	SVz* (m)
		Min.	Max.		(m)	(m)	(m)	Principal Azimuth	Principal Dip	Intermediate Azimuth		Estimation Method	Estimation					
<b>MCBT / WMCBT / MAMP</b>																		
P2O5%	1	6	16	80	18	22	50	0	140	OK / NN	Ellipsoid	9.00	40	9	11			
P2O5%	2	6	16	160	50	50	50	0	140	OK / NN	Ellipsoid	9.00	80	25	25			
P2O5%	3	6	16	320	70	90	50	0	140	OK / NN	Ellipsoid	9.00	160	35	45			
CAO%	1	6	16	80	18	22	50	0	140	OK	Ellipsoid							
CAO%	2	6	16	160	50	50	50	0	140	OK	Ellipsoid							
CAO%	3	6	16	320	70	90	50	0	140	OK	Ellipsoid							
MGO%	1	6	16	80	18	22	50	0	140	OK	Ellipsoid							
MGO%	2	6	16	160	50	50	50	0	140	OK	Ellipsoid							
MGO%	3	6	16	320	70	90	50	0	140	OK	Ellipsoid							
FE2O3%	1	6	16	80	18	22	50	0	140	OK	Ellipsoid							
FE2O3%	2	6	16	160	50	50	50	0	140	OK	Ellipsoid							
FE2O3%	3	6	16	320	70	90	50	0	140	OK	Ellipsoid							
SIO2%	1	6	16	80	18	22	50	0	140	OK	Ellipsoid							
SIO2%	2	6	16	160	50	50	50	0	140	OK	Ellipsoid							
SIO2%	3	6	16	320	70	90	50	0	140	OK	Ellipsoid							
AL2O3%	1	6	16	80	18	22	50	0	140	OK	Ellipsoid							
AL2O3%	2	6	16	160	50	50	50	0	140	OK	Ellipsoid							
AL2O3%	3	6	16	320	70	90	50	0	140	OK	Ellipsoid							
<b>CBTSAP</b>																		
P2O5%	1	6	12	80	18	22	50	0	140	OK / NN	Ellipsoid	25	40	9	11			
P2O5%	2	6	24	160	50	50	50	0	140	OK / NN	Ellipsoid	25	80	25	25			
P2O5%	3	6	24	320	70	90	50	0	140	OK / NN	Ellipsoid	25	160	35	45			
CAO%	1	6	12	80	18	22	50	0	140	OK	Ellipsoid							
CAO%	2	6	24	160	50	50	50	0	140	OK	Ellipsoid							
CAO%	3	6	24	320	70	90	50	0	140	OK	Ellipsoid							
MGO%	1	6	12	80	18	22	50	0	140	OK	Ellipsoid							
MGO%	2	6	24	160	50	50	50	0	140	OK	Ellipsoid							
MGO%	3	6	24	320	70	90	50	0	140	OK	Ellipsoid							
FE2O3%	1	6	12	80	18	22	50	0	140	OK	Ellipsoid							
FE2O3%	2	6	24	160	50	50	50	0	140	OK	Ellipsoid							
FE2O3%	3	6	24	320	70	90	50	0	140	OK	Ellipsoid							
SIO2%	1	6	12	80	18	22	50	0	140	OK	Ellipsoid							
SIO2%	2	6	24	160	50	50	50	0	140	OK	Ellipsoid							
SIO2%	3	6	24	320	70	90	50	0	140	OK	Ellipsoid							
AL2O3%	1	6	12	80	18	22	50	0	140	OK	Ellipsoid							
AL2O3%	2	6	24	160	50	50	50	0	140	OK	Ellipsoid							
AL2O3%	3	6	24	320	70	90	50	0	140	OK	Ellipsoid							
<b>AMPSAP</b>																		
P2O5%	1	6	12	80	18	22	50	0	140	OK / NN	Ellipsoid	13	40	9	11			
P2O5%	2	6	24	160	50	50	50	0	140	OK / NN	Ellipsoid	13	80	25	25			
P2O5%	3	6	24	320	70	90	50	0	140	OK / NN	Ellipsoid	13	160	35	45			
CAO%	1	6	12	80	18	22	50	0	140	OK	Ellipsoid							
CAO%	2	6	24	160	50	50	50	0	140	OK	Ellipsoid							
CAO%	3	6	24	320	70	90	50	0	140	OK	Ellipsoid							
MGO%	1	6	12	80	18	22	50	0	140	OK	Ellipsoid							
MGO%	2	6	24	160	50	50	50	0	140	OK	Ellipsoid							
MGO%	3	6	24	320	70	90	50	0	140	OK	Ellipsoid							
FE2O3%	1	6	12	80	18	22	50	0	140	OK	Ellipsoid							
FE2O3%	2	6	24	160	50	50	50	0	140	OK	Ellipsoid							
FE2O3%	3	6	24	320	70	90	50	0	140	OK	Ellipsoid							
SIO2%	1	6	12	80	18	22	50	0	140	OK	Ellipsoid							
SIO2%	2	6	24	160	50	50	50	0	140	OK	Ellipsoid							
SIO2%	3	6	24	320	70	90	50	0	140	OK	Ellipsoid							
AL2O3%	1	6	12	80	18	22	50	0	140	OK	Ellipsoid							
AL2O3%	2	6	24	160	50	50	50	0	140	OK	Ellipsoid							
AL2O3%	3	6	24	320	70	90	50	0	140	OK	Ellipsoid							

\* GEMS rotations

Table 14.8 Search Parameters Specific Gravity

Domain	Estimation Run	Search Ellipse							Estimation Method	Search type	
		Composites		SVx	SVy	SVz	GEMS Rotation (ADA)				
		Min.	Max.	(m)	(m)	(m)	Principal Azimuth	Principal Dip			Intermediate Azimuth
<b>MCBT / WMCBT / CBTSAP (ORE and WASTE)</b>											
S.G.	1	6	16	190	190	190	0	0	0	OK	Ellipsoid
S.G.	2	6	16	400	400	400	0	0	0	OK	Ellipsoid
S.G.	3	6	16	1500	1500	1500	0	0	0	OK	Ellipsoid
<b>MAMP / WMAMP / AMPSAP (ORE and WASTE)</b>											
S.G.	1	6	16	225	225	225	0	0	0	OK	Ellipsoid
S.G.	2	6	16	450	450	450	0	0	0	OK	Ellipsoid
S.G.	3	6	16	1500	1500	1500	0	0	0	OK	Ellipsoid
<b>ROCK / WEATHER / SAP (WASTE)*</b>											
S.G.	1	6	16	225	225	225	0	0	0	OK	Ellipsoid
S.G.	2	6	16	450	450	450	0	0	0	OK	Ellipsoid
S.G.	3	6	16	1500	1500	1500	0	0	0	OK	Ellipsoid

\* Meta-syenite and Gneiss

### Resource Classification

The resource classification involved a two-stage process.

**Stage 1:** Relevant mathematical parameters were saved in the block model and the blocks. These variables are:

- i. Interpolation pass (*pass*);
- ii. Distance of the closest sample from the block center (*mindist*);
- iii. Average distance of samples used in estimating any block (*avdist*);
- iv. Number of drill holes used for estimating any block (*nndh*);
- v. The kriging variance of grade estimation (*kvar*).

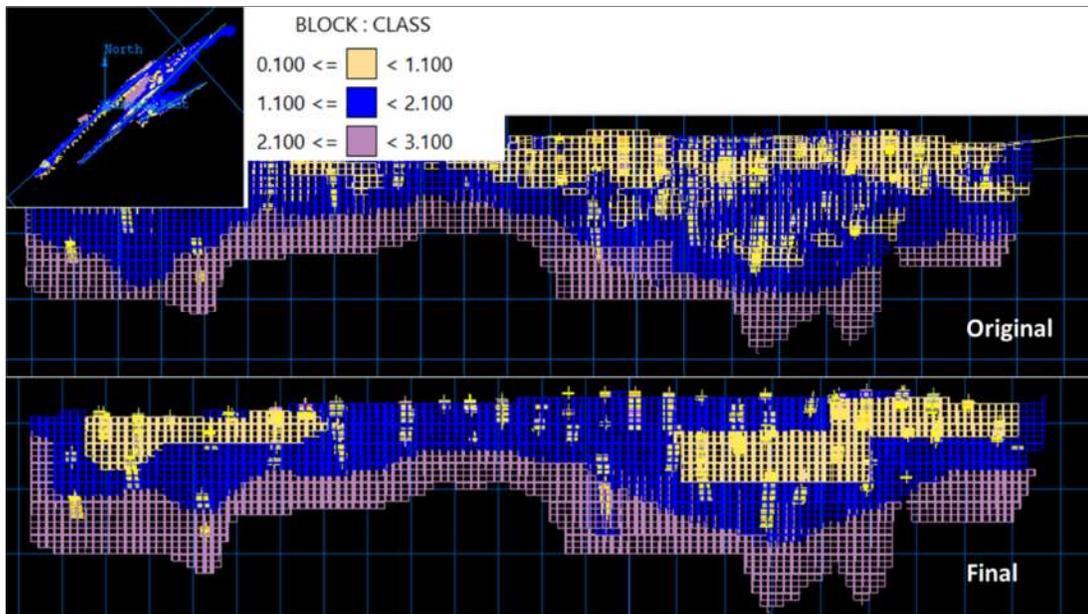
**Stage 2:** The above variables were used as supporting mathematical variables for finalization of the resource classification process. At this stage, the resource blocks were coded manually for achieving the following:

- vi. Most of **Measured** category blocks were supported by three or more holes and nearly 20 composites;
- vii. **Measured** category blocks have at least one drill hole within half of the variogram range (major axis);
- viii. Most of **indicated** category blocks are supported by at least two drill holes and nearly 15 composites;

- ix. Measured category blocks have at least one drill hole within half of the variogram range (major axis);
- x. Remaining blocks with a P<sub>2</sub>O<sub>5</sub> grade estimation were coded as an **Inferred Resource**.

The two-stage process of classifying resources follows a ‘best practices’ approach allowing the QP to ensure that unreasonable conditions of: 1) measured blocks and inferred category blocks occurring side-by-side and 2) the measured and indicated blocks are not dominated by blocks with low sample support i.e., one drill hole with less than 10 composites<sup>6</sup>. The two-stage approach is a time-consuming process of smoothing the mixed Measured, Indicated and Inferred category blocks. However, this process eliminates the stripe or, spotted dog effect. Figure 14.5 demonstrates the difference between the initial and final resource classification.

**Figure 14.5 Example of Stage 2 Resource Coding**

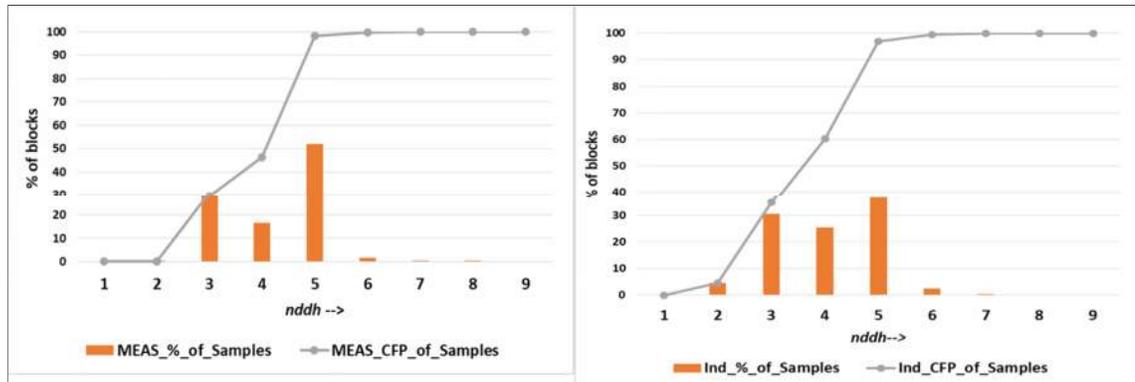


As a result of the two-stage process, the following was achieved:

- i. 70% of Measured blocks are supported by 3 or more drill holes;
- ii. 95% of Indicated blocks are supported by two or more holes and more than 70% of Indicated blocks are supported by 3 or more holes as seen in Figure 14.6.

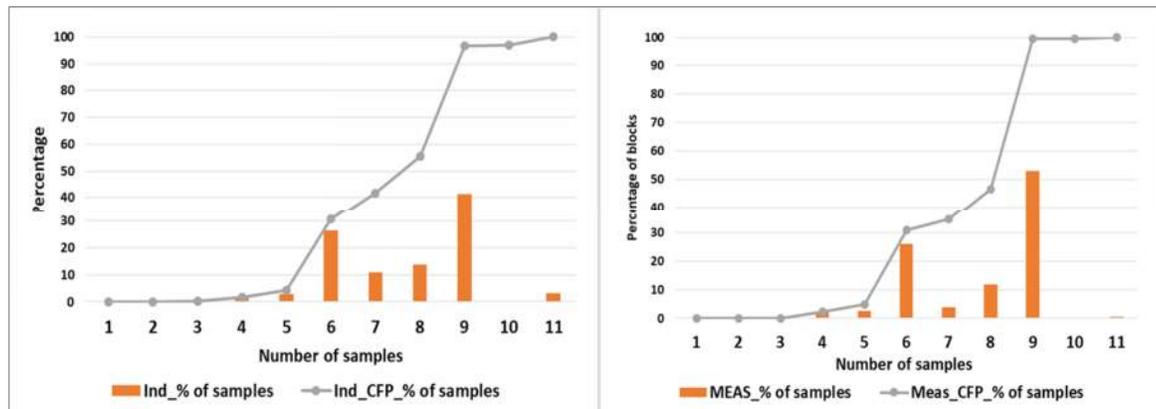
<sup>6</sup> Compared to the block height of 10 m, the composites are of 1 m length.

**Figure 14.6 Comparisons of Measured Model Blocks to Supported Drill Holes**



- iii. > 90 % of Measured blocks are supported by 10 or more drill hole composites;
- iv. Similar sample support exists for indicated resources as seen in Figure 14.7.

**Figure 14.7 Comparisons of Indicated Model Blocks to Supported Drill Holes**



- v. Most of the inferred category blocks are supported by 10 or more composite samples;
- vi. The average kvar values are much lower in Measured and Indicated blocks compared to inferred resources;
- vii. The distribution of kvar values proves that the measured resources have lower kvar values, hence indication of lower error of estimation as seen in Figure 14.8.

Figure 14.8 Kriging Variances

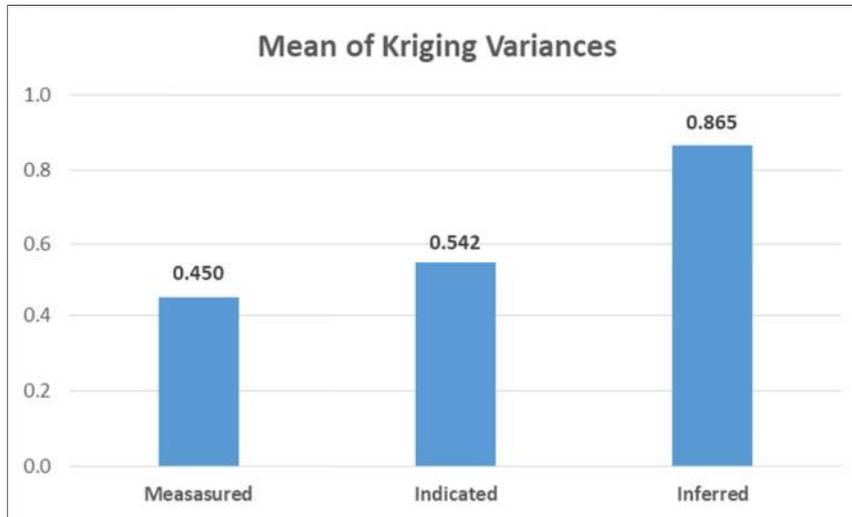


Table 14.9 presents the in-situ resource estimate for the geologic block model. This is the in-place estimate without consideration for mining method, recovery, processing or economic constraints. The in-situ estimate is based on the above stated parameters for estimation and classification of the phosphate mineralization and serves as the basis for the Mineral Resource Estimate presented in Section 14.4.

Table 14.9 In-Situ Resource for the Três Estradas Phosphate Deposit

Domain	Class	Volume (m <sup>3</sup> X 1000)	Density (T/m <sup>3</sup> )	In-Situ Tonnes (T X 1000)	Grade (wt. %)					
					P <sub>2</sub> O <sub>5</sub> %	CaO%	MgO%	Fe <sub>2</sub> O <sub>3</sub> %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %
AMSAP	Measured	36	1.54	55	6.63	10.75	9.32	15.19	37.94	7.39
	Indicated	435	1.66	711	4.82	11.31	7.52	15.42	40.08	8.57
	<b>Sub-Total</b>	<b>471</b>	<b>1.65</b>	<b>766</b>	<b>4.95</b>	<b>11.27</b>	<b>7.65</b>	<b>15.4</b>	<b>39.93</b>	<b>8.49</b>
CBTSAP	Measured	501	1.63	812	10.03	18.11	5.42	18.62	28.83	4.75
	Indicated	2,348	1.66	3,862	9.16	16.2	4.56	18.41	31.77	5.87
	Inferred	27	1.64	45	5.41	20.17	5.61	12.17	29.81	6.8
	<b>Sub-Total</b>	<b>2,876</b>	<b>1.65</b>	<b>4,719</b>	<b>9.28</b>	<b>16.57</b>	<b>4.71</b>	<b>18.38</b>	<b>31.25</b>	<b>5.68</b>
WMCBT	Measured	653	2.81	1,833	4.12	33.93	6.76	8.92	13.38	2.16
	Indicated	390	2.79	1,083	4.3	34.35	6.15	8.81	14.53	2.32
	Inferred	16	2.83	45	3.93	33.86	8.13	8.2	11.13	1.8
	<b>Sub-Total</b>	<b>1,059</b>	<b>2.8</b>	<b>2,961</b>	<b>4.18</b>	<b>34.09</b>	<b>6.56</b>	<b>8.87</b>	<b>13.76</b>	<b>2.21</b>
MCBT	Measured	12,139	2.84	34,461	3.8	34.17	8.09	8.01	11.33	1.94
	Indicated	13,637	2.85	38,788	3.64	35.02	7.49	7.6	11.36	2.15
	Inferred	8,574	2.87	24,555	3.58	34.69	7.87	7.61	11.69	2.09
	<b>Sub-Total</b>	<b>34,350</b>	<b>2.85</b>	<b>97,804</b>	<b>3.68</b>	<b>34.64</b>	<b>7.8</b>	<b>7.75</b>	<b>11.43</b>	<b>2.06</b>
MAMP	Measured	233	2.89	671	3.69	19.1	8.89	13.69	33.52	6.44
	Indicated	1,654	2.88	4,751	3.93	19.58	9.05	12.78	33.1	6.78
	Inferred	681	2.85	1,938	3.9	19.3	9.15	12.68	32.78	7.11
	<b>Sub-Total</b>	<b>2,568</b>	<b>2.87</b>	<b>7,360</b>	<b>3.9</b>	<b>19.46</b>	<b>9.06</b>	<b>12.84</b>	<b>33.05</b>	<b>6.83</b>
<b>Total</b>		<b>41,324</b>	<b>2.79</b>	<b>113,610</b>	<b>3.95</b>	<b>32.73</b>	<b>7.72</b>	<b>8.6</b>	<b>13.91</b>	<b>2.57</b>

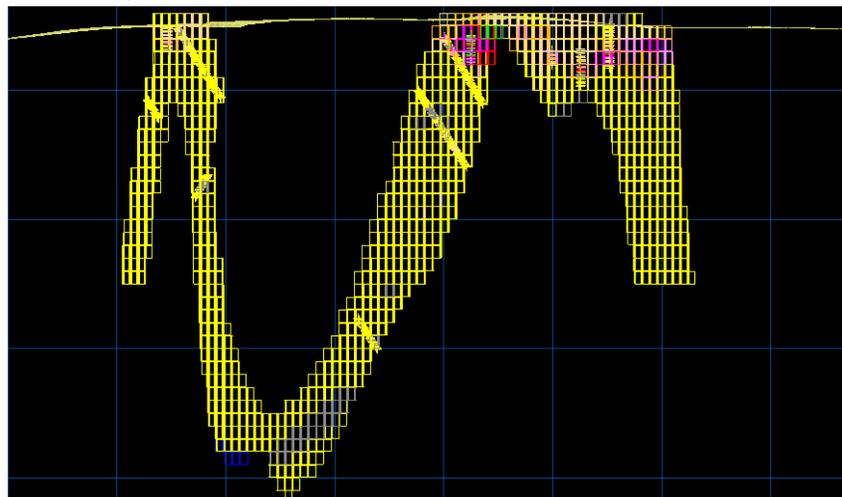
The estimated in-situ resource identifies 87.03Mt of measured plus indicated material with an average grade of 4.5% P<sub>2</sub>O<sub>5</sub>, using a minimum cut-off of 3.0% P<sub>2</sub>O<sub>5</sub>. By classification, 76.6% of the in-situ resources identified in the model are Measured and Indicated. The in-situ estimate also identifies 26.58MT of Inferred resource, with an average grade of 3.64% P<sub>2</sub>O<sub>5</sub>, Inferred resource account for 23.4% of the in-situ resources. Approximately 5% of the deposit (4.8Mt) is hosted in the saprolite (CBTSAP & AMPSAP) overlying the meta-carbonatite and amphibolite. The weathered transitional zone (WMCBT) represents 2.6% of the deposit (2.96Mt) and 105.2Mt (92%) of the resource is found in the two fresh rock domains (MAMP & MCBT).

### Model Validation

Millcreek has conducted an audit of the block model prepared by Aguia and of the resources estimated from the model. Millcreek loaded the Três Estradas block model into the Maptek Vulcan® software system, a geology and mine planning software that competes directly with GEMS. The Millcreek audit and validation of the Três Estradas block model consisted of the following steps:

1. **Visual validation:** The drill hole composited drilling data was loaded into Vulcan software to compare the grade estimation block/drill hole grade relationships in cross section view. A visual inspection of vertical cross sections spaced at 50m spacing along the strike of the mineralization showed strong correlation between drill hole assays and composited values in the model. An example of cross sections viewed through visual inspection are shown in Figure 14.9.

Figure 14.9 Representative Cross-Section



2. **Statistical Validation:** Two types of statistical validations were carried out: general statistical comparisons and statistical structures
- a. **General statistics:** The statistics of the estimated block model are compared with the composite data (Table 14.10).

**Table 14.10 General Statistics Comparing Composites to Block Model**

<b>P<sub>2</sub>O<sub>5</sub></b>								
<b>Composited Data</b>								
<b>Condition Title</b>	<b>Min</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>	<b>Max</b>	<b>Mean</b>	<b>Standard Dev.</b>	<b>Number of Samples</b>
CBTSAP	0.140	5.650	9.280	12.980	30.120	9.679	5.218	2,118
MCBT	0.090	3.140	3.600	4.240	19.000	3.801	1.258	8,539
AMPSAP	0.190	3.068	4.490	7.318	15.100	5.240	2.949	449
MAMP	0.030	2.918	3.590	4.613	11.770	3.812	1.471	709
<b>Block Model</b>								
CBTSAP	1.240	5.630	8.300	11.030	21.500	8.606	3.624	5,225
MCBT	1.230	3.360	3.610	3.970	7.870	3.681	0.492	47,709
AMPSAP	1.480	3.388	4.030	5.870	12.440	4.758	1.851	869
MAMP	2.070	3.470	3.860	4.210	6.060	3.898	0.573	3,566
<b>Al<sub>2</sub>O<sub>3</sub></b>								
<b>Composited Data</b>								
<b>Condition Title</b>	<b>Min</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>	<b>Max</b>	<b>Mean</b>	<b>Standard Dev.</b>	<b>Number of Samples</b>
CBTSAP	0.160	3.380	5.025	7.270	19.700	5.621	3.145	2,118
MCBT	0.010	1.020	1.600	2.320	20.050	2.068	1.974	8,539
AMPSAP	2.240	6.118	8.140	10.200	21.200	8.446	3.134	449
MAMP	0.100	5.858	6.720	7.600	13.230	6.751	1.445	709
<b>Block Model</b>								
CBTSAP	1.440	4.410	5.790	7.430	15.270	6.035	2.242	5,225
MCBT	0.050	1.460	1.790	2.370	10.920	2.064	1.108	47,709
AMPSAP	3.820	7.400	8.690	9.822	14.860	8.665	1.961	869
MAMP	4.400	6.270	6.880	7.330	10.240	6.834	0.818	3,566

**Table 14.10 General Statistics Comparing Composites to Block Model (continued)**

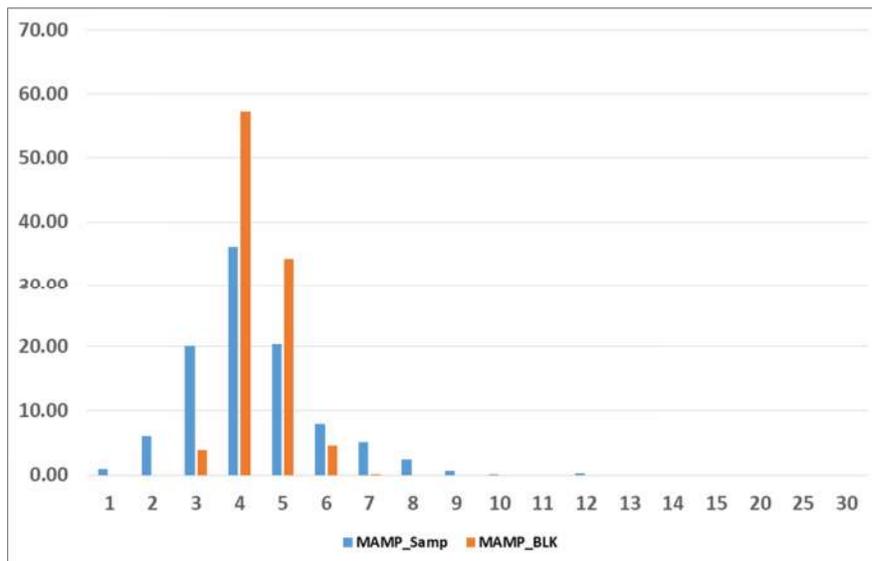
<b>Fe<sub>2</sub>O<sub>3</sub></b>								
<b>Composited Data</b>								
<b>Condition Title</b>	<b>Min</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>	<b>Max</b>	<b>Mean</b>	<b>Standard Dev.</b>	<b>Number of Samples</b>
CBTSAP	1.450	14.600	17.900	21.500	73.400	18.469	6.564	2,118
MCBT	1.520	6.370	7.390	8.960	56.600	7.946	2.603	8,539
AMPSAP	6.280	13.500	15.500	17.100	24.900	15.249	2.868	449
MAMP	1.450	11.100	12.600	14.103	22.100	12.727	2.467	709
<b>Block model</b>								
CBTSAP	7.090	14.590	17.030	21.160	40.110	18.088	5.439	5,225
MCBT	3.600	6.870	7.510	8.390	19.400	7.743	1.284	47,709
AMPSAP	10.780	13.910	15.300	16.482	19.260	15.304	1.739	869
MAMP	9.000	11.900	12.670	13.630	19.840	12.841	1.433	3,566
<b>SiO<sub>2</sub></b>								
<b>Composited Data</b>								
<b>Condition Title</b>	<b>Min</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>	<b>Max</b>	<b>Mean</b>	<b>Standard Dev.</b>	<b>Number of Samples</b>
CBTSAP	2.420	23.800	31.300	38.000	90.200	31.324	11.462	2,118
MCBT	0.970	7.230	9.980	13.850	83.470	11.795	7.656	8,539
AMPSAP	22.600	35.375	39.640	43.600	81.300	40.569	8.668	449
MAMP	5.040	30.800	34.100	36.600	97.600	33.489	6.053	709
<b>Block Model</b>								
CBTSAP	10.270	27.440	32.780	37.770	59.050	32.586	7.956	5,225
MCBT	1.720	8.910	10.710	13.440	35.180	11.448	3.870	47,709
AMPSAP	29.010	38.007	40.540	43.500	61.790	40.824	5.635	869
MAMP	20.240	30.460	33.680	35.540	53.360	33.094	3.599	3,566
<b>MgO</b>								
<b>Composited Data</b>								
<b>Condition Title</b>	<b>Min</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>	<b>Max</b>	<b>Mean</b>	<b>Standard Dev.</b>	<b>Number of Samples</b>
CBTSAP	0.100	1.700	4.385	7.360	15.500	4.806	3.402	2,118
MCBT	0.760	5.580	6.950	9.330	17.500	7.702	3.083	8,539
AMPSAP	0.240	4.840	8.040	9.730	14.600	7.414	3.269	449
MAMP	0.100	8.358	9.100	9.823	16.000	9.027	1.375	709
<b>Block Model</b>								
CBTSAP	0.330	2.460	4.570	6.260	12.200	4.483	2.401	5,225
MCBT	2.160	6.320	7.270	9.000	15.670	7.790	2.010	47,709
AMPSAP	0.830	6.333	7.770	9.043	12.410	7.252	2.645	869
MAMP	6.350	8.610	9.250	9.590	11.340	9.067	0.775	3,566

**Table 14.10 General Statistics Comparing Composites to Block Model (continued)**

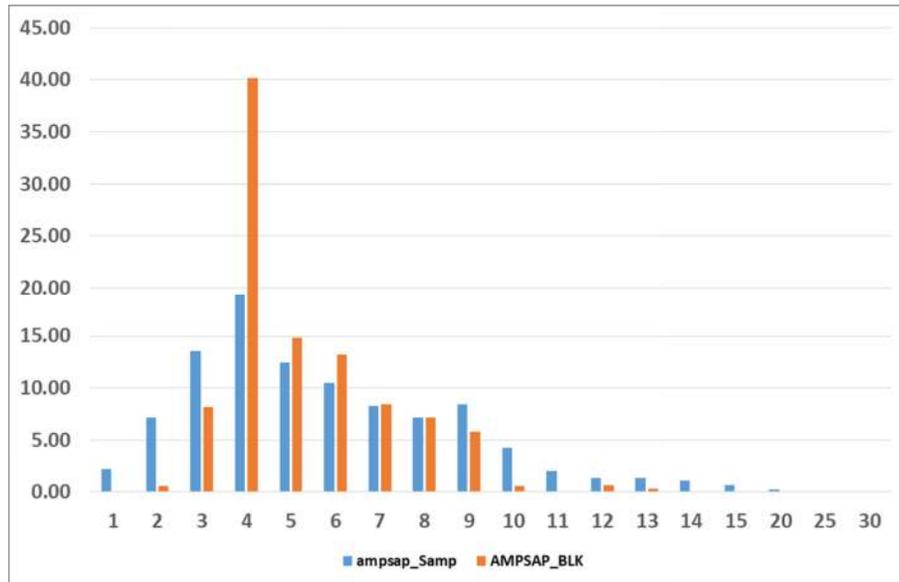
CaO								
Composited Data								
Condition Title	Min	Q1	Median	Q3	Max	Mean	Standard Dev.	Number of Samples
CBTSAP	0.370	11.300	15.400	20.560	49.300	16.596	8.255	2,118
MCBT	2.200	30.262	35.570	39.580	50.900	34.436	7.266	8,539
AMPSAP	0.440	7.740	11.100	13.625	24.500	10.782	4.437	449
MAMP	0.140	17.500	19.100	21.300	43.000	19.408	3.717	709
Block Model								
CBTSAP	2.350	12.280	15.110	18.863	40.800	15.838	5.559	5,225
MCBT	14.920	32.170	34.850	37.930	46.510	34.643	4.118	47,709
AMPSAP	3.490	8.835	11.340	13.112	19.330	10.870	3.187	869
MAMP	10.930	18.370	19.250	20.000	27.310	19.428	2.013	3,566

- b. **Comparison of histograms:** Comparison of histograms of the input composites of P<sub>2</sub>O<sub>5</sub> with that of the block model (Figure 14.10 – 14.13) suggest that the P<sub>2</sub>O<sub>5</sub> grade estimations are closely matched with the statistical structure of the composited data.

**Figure 14.10 Statistical Comparison of P<sub>2</sub>O<sub>5</sub> Block Model Grade Estimates with that of the Composited Data in Mineralized Amphibolite (MAMP)**



**Figure 14.11 Statistical Comparison of P<sub>2</sub>O<sub>5</sub> Block Model Grade Estimates with that of the Composited Data in Saprolitic Amphibolite (AMPSAP)**



**Figure 14.12 Statistical Comparison of P<sub>2</sub>O<sub>5</sub> Block Model Grade Estimates with that of the Composited Data in Mineralized Carbonatite (MCBT)**

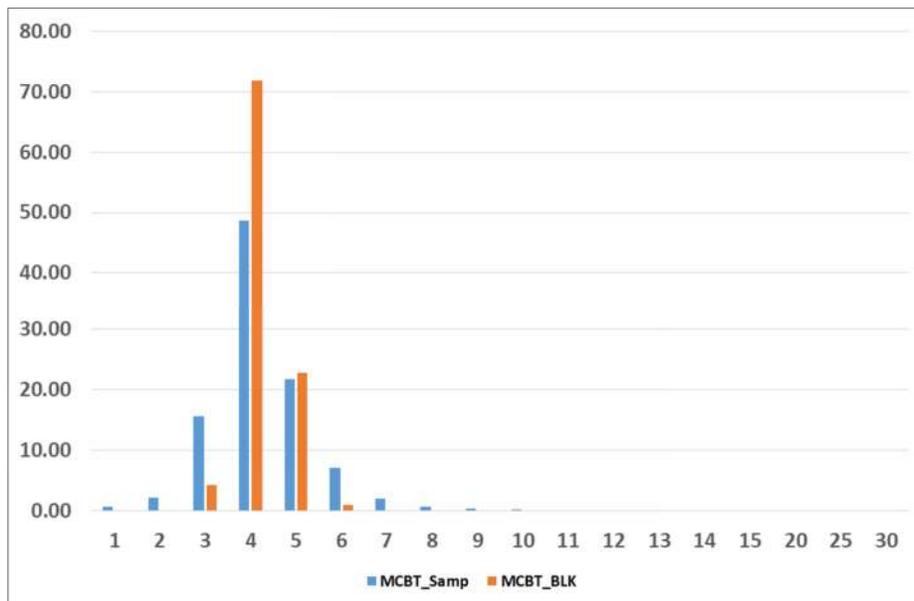
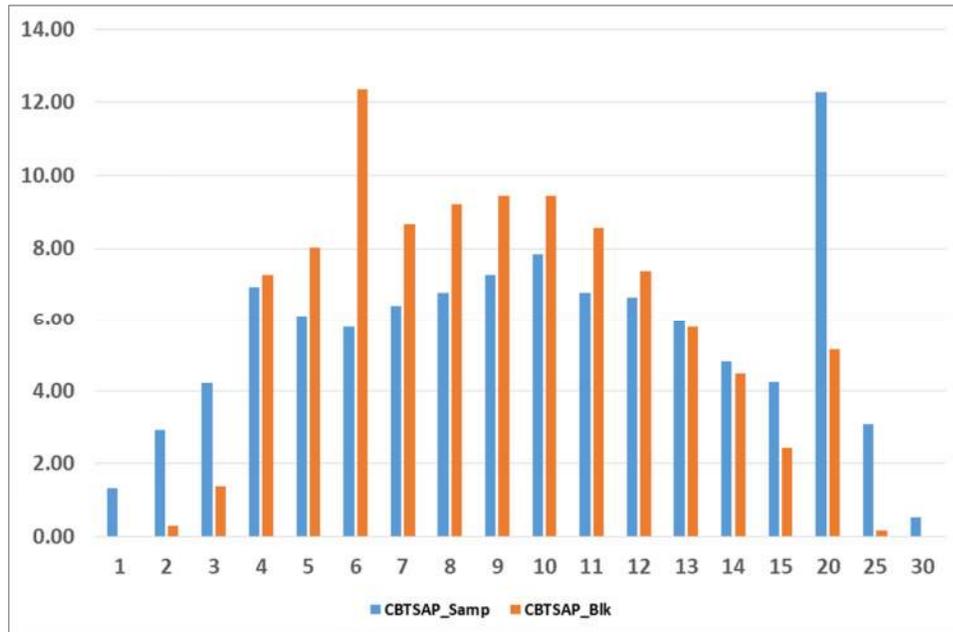


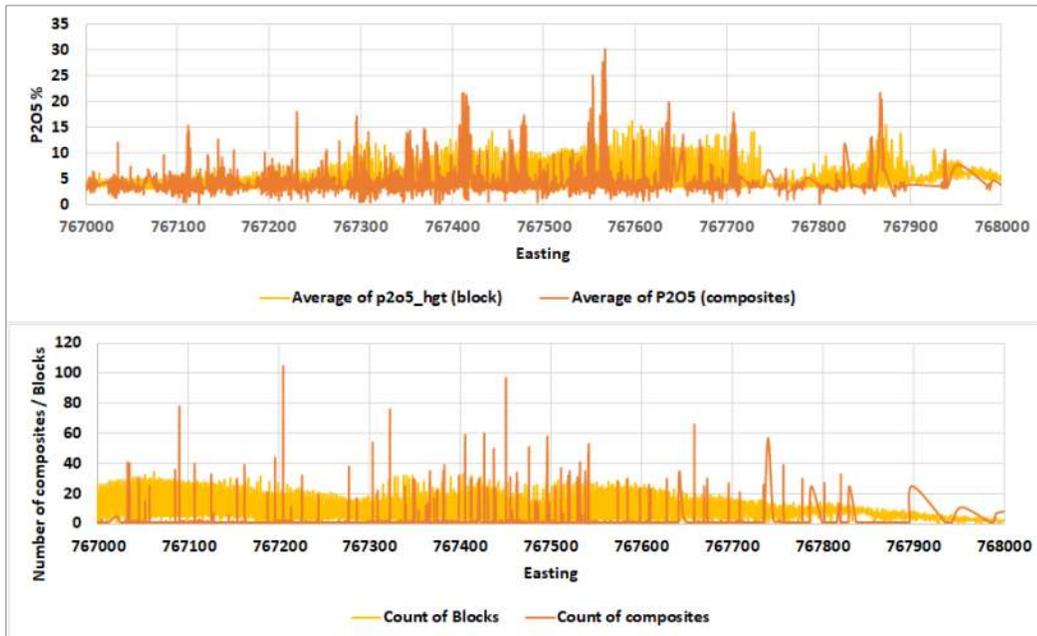
Figure 14.13 Statistical Comparison of P<sub>2</sub>O<sub>5</sub> Block Model Grade Estimates with that of the Composited Data in the Saprolitic Meta-Carbonatite (CBTSAP)



Close observation of these comparisons suggests that the estimates of P<sub>2</sub>O<sub>5</sub> in the block models compare very well within the P<sub>2</sub>O<sub>5</sub> values of the composites.

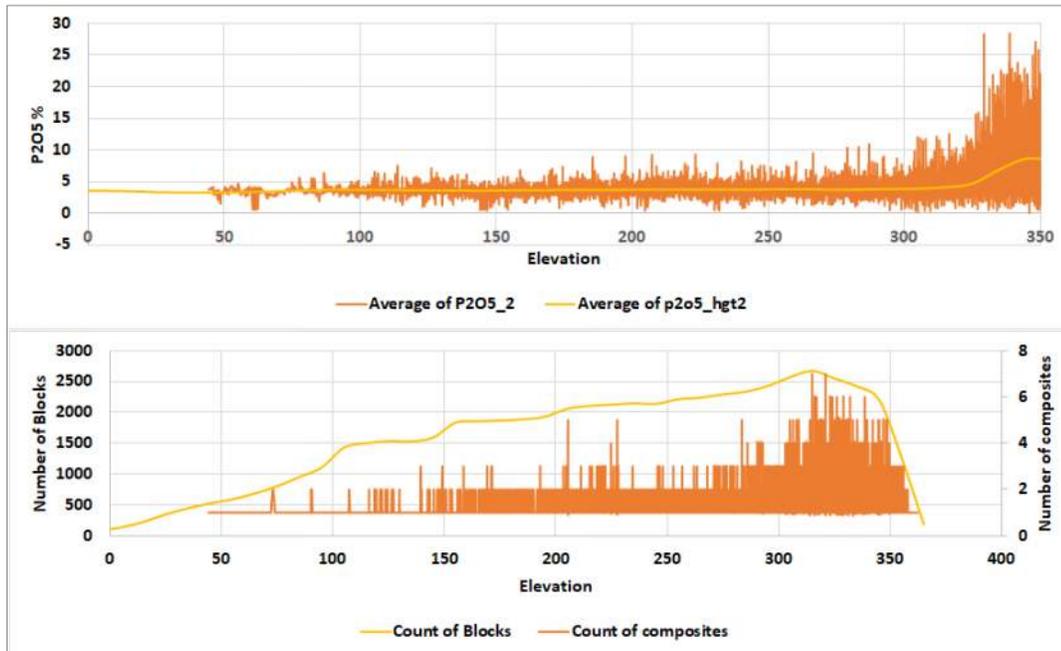
3. **Spatial validation (Swath plots):** The block model was evaluated using a series of swath plots. A swath plot is a graphical display of the grade distribution derived from a series of bands, or swaths, generated as sections through the deposit.
  - a. **Along East-West:** Grade variations from the ordinary kriging model are compared to the original composites along East-West (Figure 14.14) shows that the estimates of P<sub>2</sub>O<sub>5</sub> grades in the block model with better sample support match closely with that of composites.

**Figure 14.14 Swath plots Comparing the P<sub>2</sub>O<sub>5</sub> Block Model Grade Estimates with that of the Composited Data Along Easting**



- b. Vertical: A similar comparison of the grade variations of P<sub>2</sub>O<sub>5</sub> block model estimates to the original composites along vertical direction (Figure 14.15) further validates the observation made from the east-west swath plots. The averages of the block model are much smoother due to interpolation.

Figure 14.15 Swath Plots Comparing the P<sub>2</sub>O<sub>5</sub> Block Model Grade Estimates with that of the Composited Data Along Vertical Direction



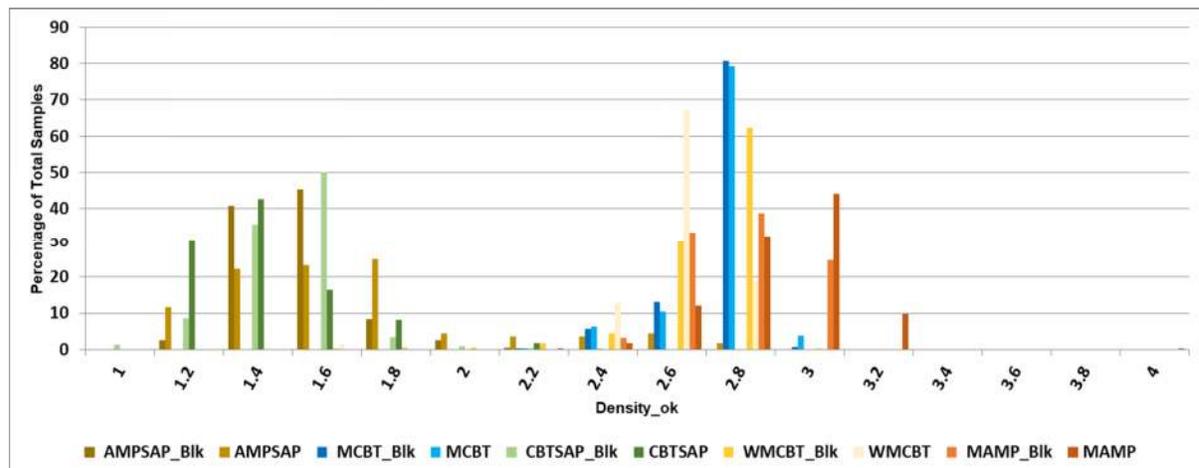
4. **Specific Gravity (SG) model validation:** The SG composited data was used to create a krigged model that represents the variability of SG in the deposit.
  - a. **Statistical comparison:** A statistical comparison of SG (Table 14.11) suggests a reasonable match of estimated values with the input composite data.

**Table 14.11 Statistical Comparison of Density Model**

SG								
Composited Data								
Condition Title	Min	Q1	Median	Q3	Max	Mean	Standard Dev.	Number of Samples
MCBT	2.310	2.823	2.865	2.910	3.180	2.849	0.116	1606
CBTSAP	1.260	1.370	1.510	1.610	2.330	1.522	0.196	61
WMCBT	1.770	2.643	2.720	2.775	2.935	2.702	0.145	79
MAMP	2.366	2.890	3.013	3.120	4.490	2.994	0.178	937
AMPSAP	1.200	1.525	1.714	1.910	2.960	1.783	0.366	112
Block Model								
MCBT	2.355	2.830	2.874	2.911	3.071	2.847	0.108	47709
CBTSAP	1.023	1.536	1.610	1.678	2.549	1.597	0.146	16745
WMCBT	1.767	2.760	2.829	2.880	3.002	2.795	0.138	1476
MAMP	2.510	2.742	2.866	2.999	3.167	2.866	0.141	3566
AMPSAP	1.283	1.500	1.656	1.763	2.219	1.647	0.167	3201

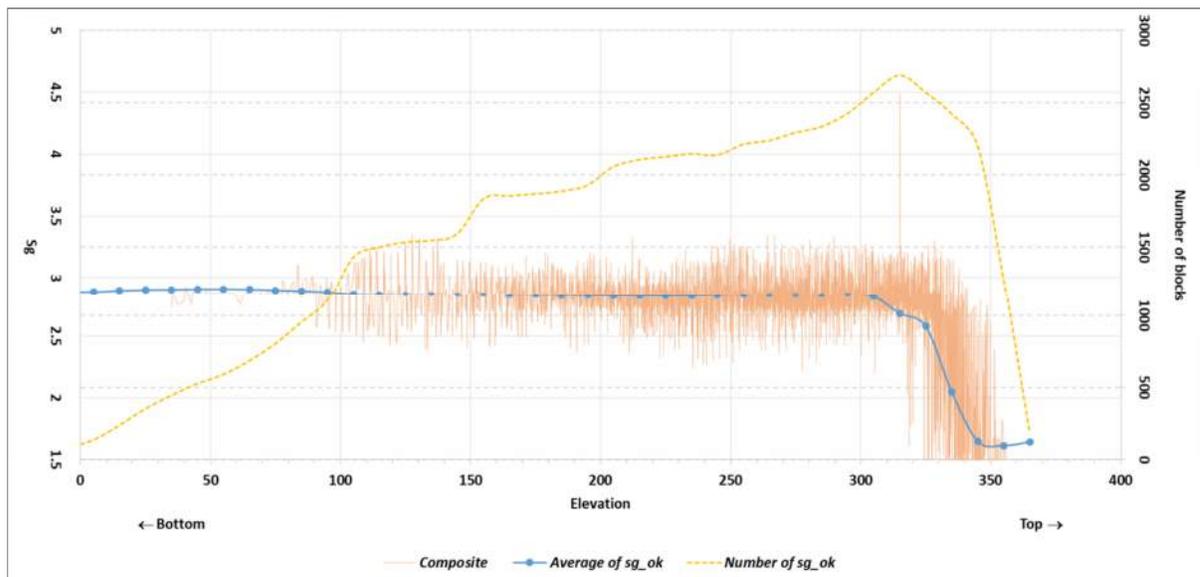
- b. **Comparison of statistical distribution:** The comparison of histograms of the composites and block model show a good match of the statistical distribution. (Figure 14.16) This is a major improvement over use of averaged density values for each rock type.

**Figure 14.16 Histograms of SG Block Model Grade Estimates with that of the Composited Data for all Major Rock Types**



- c. **Swath plots of SG:** Due to change in type and quality of rocks along vertical direction, a swath plot of SG along vertical direction (Figure 14.17) was generated to compare the spatial variation of SG. This diagram along with the histograms in Figure 14.16 proves that the density variability is well represented in this resource model.

**Figure 14.17 Histograms of SG Block Model Grade Estimates with that of the Compositing Data for All Major Rock Types**



## 14.4 MINERAL RESOURCE ESTIMATE

The CIM Definition Standards defines:

*“A ‘Mineral Resource’ is a concentration or occurrence of natural solid material of economic interest in or on the Earth’s crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.”*

The phrase “reasonable prospects for eventual economic extraction” implies that the quantity and grade estimates meet certain economic thresholds and that the mineral resources are reported at an appropriate cut-off grade that takes into account the extraction method and processing recovery. Millcreek considers the phosphate

mineralization at the Três Estradas deposit to be amenable to extraction using open-pit mining methods. Millcreek has used the Lerchs-Grossman optimizing algorithm to evaluate the profitability of each resource block in the model based on its value. Optimization parameters are summarized in Table 14.12 and are derived from recent pilot-plant testing presented in Section 13, updated geotechnical assumptions and findings from the Preliminary Economic Assessment completed May 12, 2017.

**Table 14.12 Três Estradas Pit Optimization Parameters**

<b>Parameters</b>	<b>Value</b>
Cut-off grade P <sub>2</sub> O <sub>5</sub>	3.0%
Mining Recovery/Mining Dilution	100 / 0
Process Recovery P <sub>2</sub> O <sub>5</sub> Sapolite	87%
Process Recovery P <sub>2</sub> O <sub>5</sub> Fresh	80%
Concentrate Grade Sapolite	35.0%
Concentrate Grade Fresh Rock	32.0%
Overall Pit Slope Angle Sapolite/Fresh Rock	34/51 & 55 Degrees
Mining Cost (US\$/tonne Mined)	1.32
Process Cost (US\$/tonne ROM)	4.06
G&A (US\$/tonne of ROM)	0.79
Selling Price (US\$/tonne of concentrate at 30.2% P <sub>2</sub> O <sub>5</sub> )	\$215
Royalties (CFEM Tax) - Gross	2%
Marketing Costs - Gross	2%
Exchange Rate (US\$ to R\$)	3.2

Using the Lerchs-Grossman algorithm, Millcreek has developed an optimized pit shell using the above parameters. The optimized pit shell captures the resources estimated in the block model that have reasonable prospects for economic extraction.

The pit optimization results are used solely for the purpose of testing the “reasonable prospects for economic extraction” and do not represent an attempt to estimate mineral reserves. Mineral reserves can only be estimated with a further detailed level of study. There are no mineral reserves being reported in this study for the Três Estradas deposit. Table 14.13 presents the Mineral Resource Estimate for the Três Estradas Phosphate Project, audited and confirmed by Millcreek.

**Table 14.13 Audited Mineral Resource Estimate\*, Três Estradas Phosphate Project, Millcreek Mining Group, September 8, 2017**

Resource Classification	Domain	Volume (m <sup>3</sup> X 1000)	Tonnage (T X 1000)	Density (T/m <sup>3</sup> )	P <sub>2</sub> O <sub>5</sub> %	P <sub>2</sub> O <sub>5</sub> as Apatite (%)
Measured	AMSAP	36	55	1.54	6.63	15.70
	CBTSAP	491	796	1.63	10.18	24.11
	WMCBT	602	1,686	2.81	4.24	10.03
	MCBT	11,619	33,004	2.85	3.85	9.12
	MAMP	227	655	2.89	3.72	8.81
<b>Total Measured</b>		<b>12,975</b>	<b>36,196</b>	<b>2.82</b>	<b>4.01</b>	<b>9.50</b>
Indicated	AMSAP	400	653	1.65	5.00	11.85
	CBTSAP	2,330	3,834	1.66	9.21	21.82
	WMCBT	370	1,026	2.78	4.38	10.39
	MCBT	13,000	36,984	2.85	3.67	8.69
	MAMP	1,571	4,517	2.88	3.98	9.43
<b>Total Indicated</b>		<b>17,671</b>	<b>47,014</b>	<b>2.74</b>	<b>4.18</b>	<b>9.91</b>
<b>Total Measured + Indicated Resources</b>		<b>30,646</b>	<b>83,210</b>	<b>2.77</b>	<b>4.11</b>	<b>9.73</b>
Inferred	CBTSAP	27	45	1.64	5.41	12.82
	WMCBT	16	45	2.83	3.93	9.32
	MCBT	7,034	20,247	2.88	3.65	8.64
	MAMP	528	1,508	2.87	3.89	9.22
<b>Total Inferred</b>		<b>7,605</b>	<b>21,845</b>	<b>2.88</b>	<b>3.67</b>	<b>8.69</b>

\* Mineral resources are not mineral reserves and do not have demonstrated economic viability. All numbers have been rounded to reflect relative accuracy of the estimates. Mineral resources are reported within a conceptual pit shell at a cut-off grade of 3% P<sub>2</sub>O<sub>5</sub>. Optimization parameters are stated in Table 14.12

The Audited Mineral Resource identifies 83.21Mt of measured and indicated material with an average grade of 4.11% P<sub>2</sub>O<sub>5</sub> using a minimum cut-off of 3.0% P<sub>2</sub>O<sub>5</sub>. The estimate also identifies 21.85Mt of inferred material with an average grade of 3.67% P<sub>2</sub>O<sub>5</sub>. By classification, 79% of the resources contained within the optimized pit shell are measured and indicated with the remaining 21% of the resource classified as inferred resource.

The Geology QP is not aware of or perceives any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors having any material impact on the resource estimates other than what has already been discussed in this report.

**The accuracy of resource and reserve estimates is, in part, a function of the quality and quantity of available data and of engineering and geological**

interpretation and judgment. Given the data available at the time this report was prepared, the estimates presented herein are considered reasonable. However, they should be accepted with the understanding that additional data and analysis available subsequent to the date of the estimates may necessitate revision. These revisions may be material. There is no guarantee that all or any part of the estimated resources or reserves will be recoverable.

**15 RESERVES**

There are no mineral reserve estimates associated with this report.

**16 MINING**

There has been no additional work done in regard to Mining since the PEA report titled “*Technical Report, Três Estradas Phosphate Project, Rio Grande do Sul, Brazil, Preliminary Economic Assessment*” dated May 12, 2017.

**17 MINERALS PROCESSING**

There has been no additional work done in regard to Minerals Processing since the PEA report titled *“Technical Report, Três Estradas Phosphate Project, Rio Grande do Sul, Brazil, Preliminary Economic Assessment”* dated May 12, 2017.

## **18 PROJECT INFRASTRUCTURE**

There has been no additional work done in regard to Project Infrastructure since the PEA report titled *“Technical Report, Três Estradas Phosphate Project, Rio Grande do Sul, Brazil, Preliminary Economic Assessment”* dated May 12, 2017.

## **19 MARKET STUDIES AND CONTRACTS**

There has been no additional work done in regard to Market Studies and Contracts since the PEA report titled *“Technical Report, Três Estradas Phosphate Project, Rio Grande do Sul, Brazil, Preliminary Economic Assessment”* dated May 12, 2017.

**20 HEALTH, SAFETY, ENVIRONMENT AND COMMUNITY RELATIONS  
CONSIDERATIONS**

There has been no additional work done in regard to Health, Safety, Environment and Community Relations Considerations since the PEA report titled “*Technical Report, Três Estradas Phosphate Project, Rio Grande do Sul, Brazil, Preliminary Economic Assessment*” dated May 12, 2017.

**21 CAPITAL AND OPERATING COSTS**

There has been no additional work done in regard Capital and Operating Costs since the PEA report titled *“Technical Report, Três Estradas Phosphate Project, Rio Grande do Sul, Brazil, Preliminary Economic Assessment”* dated May 12, 2017.

## **22 ECONOMIC ANALYSIS**

There has been no additional work done in regard to Economic Analysis since the PEA report titled *“Technical Report, Três Estradas Phosphate Project, Rio Grande do Sul, Brazil, Preliminary Economic Assessment”* dated May 12, 2017.

## **23 ADJACENT PROPERTIES**

There is no data or information available for adjacent properties that are pertinent to present report.

**24 OTHER RELEVANT DATA AND INFORMATION**

There is no relevant data or information to present in this report.

## 25 INTERPRETATION AND CONCLUSIONS

Exploration and drilling to date has defined an elongated carbonatite intrusion at Três Estradas with a strike of 50° to 60°. The carbonatite intrusion forms a tightly folded sequence of meta-carbonatite and amphibolite with limbs dipping steeply from 70° to vertical (90°). The surface expression of the intrusion is approximately 2.5km along strike with a width of approximately 300m. The carbonatite (meta-carbonatite) is intensely recrystallized and metamorphosed to amphibolite assemblages. Drilling has identified apatite mineralization to a depth of 370m.

The latest drilling program completed in June 2017 has been successful in delineating the majority of inferred resources reported in the June 24, 2016 Mineral Resource Estimate to Measured and Indicated Resources. The drilling program has also identified a new zone of mineralization along the southeast side of the Três Estradas Deposit. The new zone of mineralization is situated in an anticlinal limb to the main deposit dipping to the southeast. The overall size of the deposit (Measured + Indicated + Inferred) has grown approximately 40%.

From the block model, an in-situ resource of 113.61Mt of material with an average grade of 3.95% P<sub>2</sub>O<sub>5</sub> using a minimum cut-off of 3.0% P<sub>2</sub>O<sub>5</sub> has been identified for Três Estradas. Measured and Indicated resources account for 87.03Mt (76.6%) of the resource with inferred resources accounting for the remaining 23.4% of the in-situ resource. Measured and Indicated Resources have an average grade of 4.11% P<sub>2</sub>O<sub>5</sub> using a minimum cut-off of 3.0% P<sub>2</sub>O<sub>5</sub>.

Pit optimization has been employed to determine those resources that have reasonable prospects for economic extraction based on parameters presented in this study. The optimized pit for Três Estradas contains 105.06Mt of material with an average grade of 4.01% P<sub>2</sub>O<sub>5</sub> using a minimum cut-off of 3.0% P<sub>2</sub>O<sub>5</sub>. By classification, 79% of the resources contained within the optimized pit shell are Measured and Indicated with the remaining 21% of the resource classified as Inferred resource. The optimized pit contains 83.21MT of Measured plus Indicated resources with an average grade of 4.11% P<sub>2</sub>O<sub>5</sub> using a minimum cut-off of 3.0% P<sub>2</sub>O<sub>5</sub>. With the results of the latest drilling program, Agua has been able to confirm more Measured and Indicated resources than what was contained in the total resource (Measured + indicated + Inferred) in the 2016 Mineral Resource Estimate.

Determination of those resources that have reasonable prospects for economic extraction relies, in part, on the expected grade recovery of phosphate according it's

metallurgical properties and the response of the ores to various metallurgical processes. Mineral processing and metallurgical testing for the Tres Estradas project has been ongoing since 2012. Over that time, the understanding of the metallurgical properties and characteristics of the ore, and its response to various processes to concentrate and recover phosphate, has gradually improved. Metallurgical and process testing has culminated in Eriez's most recent pilot-plant testing for flotation (2017), supported with a recent comminution study (Metso, 2017). Pilot-plant testing has confirmed the following:

- Phosphate grade and recovery are highly dependent on feed size distribution and grade;
- MIMS and WHIMS magnetic separation can improve the concentrate grades by over 2%, and reduce the MER;
- In saprolite of carbonatite, pilot-plant testing projects that a global phosphate recovery of 87% can be expected at a concentrate grade of 35% P<sub>2</sub>O<sub>5</sub>;
- In carbonatite:
  - Recirculation the second cleaner tails can provide up to 2.5% increase in P<sub>2</sub>O<sub>5</sub> recovery at a 30% final grade;
  - The use of additional cleaner stages may be more effective than a scavenger stage (not accounted for in grade – recovery projections);
  - Pilot-plant testing projects that a global phosphate recovery of 80% can be expected at a concentrate grade of 32% P<sub>2</sub>O<sub>5</sub>;
- Testing of the flotation performance for amphibolites, while only at a bench-scale, indicates that the impact of amphibolite on overall plant performance will be negligible.

The accuracy of resource and reserve estimates is, in part, a function of the quality and quantity of available data and of engineering and geological interpretation and judgment. Given the data available at the time this report was prepared, the estimates presented herein are considered reasonable. However, they should be accepted with the understanding that additional data and analysis available subsequent to the date of the estimates may necessitate revision. These revisions may be material. There is no guarantee that all or any part of the estimated resources or reserves will be recoverable.

## **26 RECOMMENDATIONS**

Agua has been very successful in delineating a sizeable resource to Measured and Indicated Resources. Agua believes they have delineated a sufficient quantity of resources to move forward with detailed engineering and other related studies to advance the Três Estradas Phosphate Project towards development.

At this time Millcreek does not see the need to continue with additional exploration drilling. There may be a need at a later date to conduct selective drilling to further delineate a specific part of the deposit depending on mine planning and design. Likewise, drilling needs may shift towards bulk sampling tests for continued metallurgical testing, geotechnical characterization and hydrology assessment. The drilling needs for these studies have not been fully assessed at this time.

## 27 REFERENCES

Agua Metais Ltda, 2012: QAQC Protocol for Diamond and Reverse Circulation Drilling - Rio Grande Project. December 2012. 113pp Internal Report.

AgroConsult, 2015: Limestone Market in Brazil, prepared for Agua Resources, Ltd., 45pp.

AgroConsult, 2015: Price and Competiveness: Phosrock Price Forecast, prepared for Agua Resources, Ltd., 20pp.

AgroConsult, 2015: Price and Competiveness: SSP Price Forecast, prepared for Agua Resources, Ltd., 16pp. Azevedo Sette Advogados, 2017: Title Opinion – Tres Estradas Phosphate Project, pp 3 -17.

Azevedo Sette Advogados, 2017: Title Opinion – Tres Estradas Phosphate Project, pp 3 -17. Azevedo Sette Advogados, 2017: Title Opinion – Tres Estradas Phosphate Project, pp 3 -17.

Azevedo Sette Advogados, 2017: Title Opinion – Tres Estradas Phosphate Project, pp 3 -17. Dance, A., SRK Consulting (Canada) Inc., 2015: Summary of SGS Minerals Services' Metallurgical Test-work on Três Estradas Samples, 27pp.

Delboni, H, Gomes, W.L., Jatoba, T.L.A., Senefonte, R., HDA Servicos, S.S., 2014: Final Report, Comminution and Flotation Test-work for Rio Grande Project, Client: Agua Metais, 163pp.

Escola Politecnica da Universidade da Sao Paulo, Departamento de Engenharia de Minas e de Petroleo, Laboratory de Caracterizacao Tecnologica, 2012: Estudos de Caracterizacao Tecnologica em Amostras De Minerio Fosfatico, Agua Resources Ltd, Final, 108pp.

Hartmann, L.A., Liu, D., Wang, Yebin, Massone, H.J & Santos, J.O.S., 2008: Protolith age of Santa Maria Chico granulites dated on zircons from an associated amphibolite-facies granodiorite in southernmost Brazil. An. Acad. Bras. Ciênc. [online]. 2008, vol.80, n.3, pp. 543-551.

KEMWorks Technology, Inc., 2015: Scoping Study for Três Estradas Phosphate Project, Final Report. Prepared for Agua Resources, Ltd..

Hercun, M., Hobert, A., Yan, E., Eriez Flotation Division, USA, 2016: Final Report SAN 18850, MTR 16-004, Client: Agua Resources, Ltd. Project: Tres Estrada Phosphate.

Leal Filho, L. de S., 2012: Development of a Phosphate Concentration Process for Agua Metais, Preliminary Studies Report – Grupo de Pesquisa em Tratamento de Minérios – Universidade de São Paulo.

Leal Filho, L. de S., 2012: Complementary Study on the Concentration of Phosphate Ores – Grupo de Pesquisa em Tratamento de Minérios – Universidade de São Paulo.

Remus, M.V.D, Dani,N., 2012: Controle Estrutural Dos Carbonititos no Rio Grande de do Sul: Análise de Productos de Sensoriamento Remoto e Aerogeofísicos (Structural Control Of Carbonatites in Rio Grande do Sul: Remote Sensing Products Analysis and Geophysics).

SGS Canada, Inc., 2015: An Investigation into A Scoping Level Flotation Test Program on Samples from the Três Estradas Phosphate Project, prepared for Agua Resources Ltd, Final Report, 198pp.

SRK Consulting (Canada) Inc., 2013: Independent Technical Report for the Três Estradas Phosphate Project, Brazil 135pp.

Tallarico, F.H.B, 2012: Companhia Brasileira do Cobre – 810.090/1991 – Relatório Final de Pesquisa (Final Exploration Report) 253pp.

Tallarico, F.H.B, 2012: Companhia Brasileira do Cobre – 810.090/1991 – Relatório Final de Pesquisa (Final Exploration Report) 253pp.

Tallarico, F.H.B, 2015: Companhia Brasileira do Cobre – 810.996/2010 – Relatório Parcial de Pesquisa (Partial Research Report) 122pp.

Walm Engenharia & Tecnologia Ambiental, 2012: Estudos Preliminares Geotécnicos, de Recursos Hídricos e Ambientais para o Projecto Fosfato Três Estradas, Volume I – Síntese dos Estudos (Preliminary studies Geotechnical , Water and Environmental Resources for Três Estradas Phosphate Project, Volume I – Summary of Studies) 26pp.

Walm Engenharia & Tecnologia Ambiental, 2012: Estudos Preliminares Geotécnicos, de Recursos Hídricos e Ambientais para o Projecto Fosfato Três Estradas, Volume II – Estudos Geotécnicos e Hidrogeológicos (Preliminary studies Geotechnical , Water and Environmental Resources for Três Estradas Phosphate Project, Volume II - Geotechnical and Hydrogeological Studies) 26pp.

Walm Engenharia & Tecnologia Ambiental, 2012: Estudos Preliminares Geotécnicos, de Recursos Hídricos e Ambientais para o Projecto Fosfato Três Estradas, Volume III –

Hidrologia (Preliminary studies Geotechnical , Water and Environmental Resources for Três Estradas Phosphate Project, Volume III - Hydrology) 110pp.

Walm Engenharia & Tecnologia Ambiental, 2012: Estudos Preliminares Geotécnicos, de Recursos Hídricos e Ambientais para o Projecto Fosfato Três Estradas, Volume IV – Estudo de Viabilidade Ambiental (Preliminary studies Geotechnical, Water and Environmental Resources for Três Estradas Phosphate Project, Volume IV – Environmental Feasibility Study) 66pp.

28 APPENDIX A: TITLE OPINION SUPPORTING EXPLORATION PERMITS

Belo Horizonte, October 17<sup>th</sup>, 2017.

To:

**TSX Venture Exchange**  
The Exchange Tower  
130 King Street West  
Toronto, Ontario  
Canada M5X 1J2

**RE: TITLE OPINION – “TRÊS ESTRADAS PHOSPHATE PROJECT”**

Dear Sirs and Madams,

In our capacity of Brazilian counsel to Agua Resources Ltd. (“**AGR**”), we are hereby providing this legal opinion to you as to 3 (three) mineral rights located in the state of Rio Grande do Sul, Brazil, in the region of Lavras do Sul, in relation to which Águia Fertilizantes S.A. (“**Águia Fertilizantes**” or “**Company**”), a company of the AGR group in Brazil, is an assignee.

This opinion exclusively analyzes the regulatory mining aspects concerning the Mineral Rights referred to Exhibit A. The scope of this opinion does not address any other analysis concerning the Mineral Rights, including technical, operational, commercial or financial aspects. Moreover, we do not express any opinion concerning issues related to environmental, labor, tax, corporate good standing or any other legal aspects apart from those expressly referred to herein. With regards to the environmental aspects, even though their respective analysis is not included under the scope of this opinion, it is important to highlight that the activities related to the *Três Estradas* Phosphate Project may be subject to environmental licensing procedures and to the fulfillment of environmental obligations.

The content of this legal opinion is destined exclusively to AGR, Águia Fertilizantes and the addressees herein. Azevedo Sette Advogados undertakes no responsibility, liability or obligation for the disclosure or reproduction of the content of this legal opinion for any purpose whatsoever.

Note that our opinion is based on the veracity and validity of all information and documents provided by AGR and Águia Fertilizantes. Furthermore, this opinion speaks only as of its date.

For the purpose of this opinion, we have examined only the specific documents and files which are expressly referenced herein including the Mining Register (*Cadastro Mineiro*) released by the Brazilian Mining Regulatory Authority (the “**DNPM**” - *Departamento Nacional de Produção Mineral*)<sup>1</sup> for public consultation on its website<sup>2</sup>. We have not made any independent investigation, nor examined clearance

<sup>1</sup>DNPM shall be replaced by the Brazilian Regulatory Mining Agency, as detailed in Exhibit B.

<sup>2</sup>The Mining Register (*Cadastro Mineiro*) refers to an electronic system data base released by the Brazilian Mining Regulatory

certificates issued by the DNPM. Moreover, we have not accessed the Mineral Rights' process files at the DNPM.

Finally, and regarding the generality of the foregoing, this opinion (i) speaks only of the Mineral Rights and does not encompass or purport to cover any other mineral right, project or activity of AGR or Águia Fertilizantes, (ii) is given only in relation to matters covered by Brazilian law currently in force, taking into account, whenever applicable, the most recent understanding of the relevant authorities, doctrine and precedents, and, (iii) we do not purport to express any opinion in relation to matters subject to the laws of any other jurisdiction.

This opinion is divided as follows: Section 1 contains the summary of our legal opinion. Exhibit A contains a chart with the detailed description of each Mineral Right. Exhibit B provides a general overview regarding the mining regulatory framework in Brazil. Exhibit C provides the corporate structure overview of the group in which Águia Fertilizantes is a part of. Exhibit D contains a chart with detailed information about the payments made by Águia Fertilizantes in favor of surface owners.

Certain terms and expressions used in this Title Opinion are defined in the Exhibits hereto.

---

Authority (*Departamento Nacional de Produção Mineral* - "DNPM") for public consultation on its website which contains general and simplified description of each mineral right process, including, for instance, non-detailed information about the location, ownership and current status of the mineral rights. The preparation of this opinion was based on the information disclosed on the Mining Register on the date of October 16<sup>th</sup>, 2017.

## 1 OUR LEGAL OPINION

1.1. With regards to the *Três Estradas Phosphate Project*, we are of the opinion that as of the date hereof:

A. **Title to Mineral Rights composing *Três Estradas Project*.** As informed by local management, the Mineral Rights, which are identified by the DNPM files #810.090/1991, #810.988/2011 and #810.325/2012, are part of the *Três Estradas Phosphate Project* and are currently in phase of exploration permit, as referred to in the chart in Exhibit A. Águia Fertilizantes is the assignee of the Mineral Rights.

Pursuant to the Company's representatives, Águia Fertilizantes is the titleholder or assignee of additional 4 (four) mineral rights (#810.996/2010, 810.346/2014, 810.347/2014, 810.649/2014) adjacent to the Mineral Rights and which are not included under the scope of this Opinion.

B. **Assignment of the mineral rights #810.090/1991 and 810.325/2012 from Companhia Brasileira do Cobre ("CBC") to Águia Fertilizantes.** *Option agreement.* According to an Option Agreement executed by and between CBC and Águia Metais Ltda. ("Águia Metais") on July 1<sup>st</sup>, 2011 and amended on December 13<sup>th</sup>, 2011 and March 27<sup>th</sup>, 2014 ("Option Agreement"), CBC granted to Águia Metais or any of its associates or subsidiaries the irrevocable purchase option of the mineral rights #810.090/1991 and #810.966/2010, as well as of any mineral right obtained by or granted to CBC and any application to mineral right submitted to DNPM by CBC, which area is located totally or partially within a radius of 10 (ten) kilometers from the external boundaries of the area encompassed by the mineral rights #810.090/1991 and #810.966/2010 ("area of interest"). Such area includes the area concerning the exploration permit application #810.325/2012 which is contemplated by the Option Agreement.

Among the obligations and rights set forth under the scope of the Option Agreement, it is worth highlighting that (i) CBC has a preemptive right in the acquisition of the production of calcium carbonate that may result from the exploitation of phosphate within the area of the mineral rights; (ii) up to 180 (one hundred eighty) days from the date of the publication of the transfer of the mineral rights #810.090/1991, 810.996/2010 and 810.325/2012 in the Brazilian Official Gazette, Águia Resources Ltd. shall issue in favor of CBC (or to whom CBC may indicate) 600,000 (six hundred thousand)<sup>3</sup> shares of its capital fully paid in as consideration for the acquisition of the mineral rights #810.090/1991; 810.996/2010, 810.325/2012, as well as any other mineral right that may be purchased by CBC within the area of interest; (iii) also in consideration for the acquisition of the mineral rights #810.090/1991; 810.996/2010, 810.325/2012, as well as any other mineral right that may be purchased by CBC within the area of interest, CBC is entitled to receive royalties levied at the rate of 2% (two percent) of the net revenue that results from the commercialization of the mineral products regarding the mineral rights #810.090/1991; 810.996/2010, 810.325/2012, as well as other mineral rights that may be purchased by Águia Metais or its affiliates within the area of interest, less the expenses expressly excluded under the

---

<sup>3</sup> As per the Third Amendment to the Option Agreement, entered into between CBC, Águia Metais, Águia Fertilizantes and Águia Resources Ltd. on June 1, 2017.

scope of the second amendment.

Note that **(a)** the payment of royalties also comprises the exploitation activities performed within the area of interest (even where such mineral rights do not pertain to CBC) and which mineral products are processed within the same industrial facility; **(b)** the total amount of royalties to be paid to CBC are limited to the maximum value of USD10,000,000.00 (ten million American dollars); **(c)** Águia Metais or its affiliates may, at any time from the exercise of the option, and without motivation, purchase the royalty right from CBC through the payment of the fixed amount of USD5,000,000.00 (five million American dollars); **(d)** the royalties shall be paid quarterly; and **(e)** the royalties' payment does not comprise mineral rights (expressly listed in the second amendment<sup>4</sup>) which, at the date of the execution of the amendment, were already subject to agreements executed by Águia Metais or its affiliates with third parties.

In addition, in the event of a change in control of Aguiá Resources Ltd. after the exercise of the option, CBC has the right to purchase up to 30% (thirty per cent) of an eventual production of calcium carbonate that may result from the exploitation of phosphate within the area of the mineral rights, as long as it does not interfere with, economically and technically, the production of phosphate within such areas.

*Exercise of Purchase Option.* On May 30<sup>th</sup>, 2012 and on May 16<sup>th</sup>, 2013, Águia Metais exercised the purchase options concerning, respectively, the mineral rights (i) #810.090/1991 and (ii) #810.996/2010 and 810.325/2012, by means of its affiliate, Águia Fertilizantes.

*Assignment of the mineral rights before DNPM.* On July 20<sup>th</sup>, 2012 and on April 7<sup>th</sup>, 2014, CBC requested before the DNPM the transfer, respectively, of the mineral rights (i) #810.090/1991 and (ii) #810.996/2010 and 810.325/2012 to Águia Fertilizantes. On September 29<sup>th</sup>, 2016, DNPM approved the transfer of the mineral right #810.996/2010 to Águia Fertilizantes. The transfer requests regarding the remaining two mineral rights are still under review by the DNPM. It is worth highlighting that, until DNPM's approval on the assignment of these mineral rights, the performance of exploration activities by Águia Fertilizantes within their respective areas shall be conducted by the Company in the name of CBC (through a valid power of attorney granted by CBC), as stipulated on DNPM's Ordinance #155/2016, article 256<sup>5</sup>.

- C. **Assignment of the mineral right #810.988/2011 from Falcon Petróleo S.A. ("Falcon") to Águia Fertilizantes.** On April 20<sup>th</sup>, 2015, Falcon requested that the DNPM transfers mineral right #810.988/2011 to Águia Fertilizantes. The request is under review by the DNPM. It is worth highlighting that, until DNPM's approval on the assignment of this mineral right, the performance of exploration activities by Águia Fertilizantes within its respective area shall be conducted by the

---

<sup>4</sup>The mineral rights listed are represented by the following processes' numbers (which shall remain excluded from the royalties' payment in case their respective files' numbers are modified by DNPM due to whatsoever reason): 810.646/2009; 810.838/2009; 810.918/2010; 810.409/2010; 811.065/2011; 810.917/2010; 810.625/1996; 810.961/2009; 810.174/1989; 810.728/2005; 811.002/2013; 810.426/2007; 810.635/2004; 810.636/2004; 810.611/2004; 810.344/2004; 810.634/2004; 810.638/2004; 810.342/2004; 810.343/2004; 810.565/2005; 810.566/2005.

<sup>5</sup>DNPM's Ordinance #155/2016, article #256: The assignor or legal representative shall continue to be liable for all duties and obligations that arise from the mining application or title until the assignment of the mineral right is registered by DNPM. Sole paragraph: Whilst the assignment of the mineral right is not registered before DNPM, the assignee may act on the mineral process, in the name of the assignor, through a power of attorney.

Company in the name of Falcon (through a valid power of attorney granted by Falcon), as stipulated on DNPM's Ordinance #155/2016, article 256.

- D. **Compliance with mining regulation.** To the best of our knowledge and pursuant to the information obtained through independent consultation on DNPM's database, we understand that:

*Mineral right #810.988/2011.* Falcon Petróleo S.A. is in compliance with the mining regulations related to this mineral right, including payment of applicable fees (TAH) and filing of mandatory forms (DIPEM).

*Mineral right #810.325/2012.* CBC is in compliance with the mining regulations related to this mineral right, including payment of applicable fees (TAH) and filing of mandatory forms (DIPEM).

*Mineral right #810.090/1991.* We did not receive information regarding the full compliance of CBC with the mining regulation notably concerning the period between April, 2006 (issuance of the mining title) and August, 2011. Moreover, as per the documents made available by Águia Fertilizantes representatives, the Declaration of Investments in Mineral Exploration regarding the year of 2012 was submitted late to DNPM by CBC. As a result of this failure, DNPM may apply to CBC penalties prescribed in article 63 of the Mining Code, such as admonition and fines. As per Provisional Measure #790/2017, regulation to be enacted shall define the criteria for the impose of sanctions, aggravating and mitigating aspects and, with regards to the administrative ordinary fines and daily fines, the economic capacity of the defaulter, as detailed in item 1.1.1.1.42. Nonetheless, the fine amounts adjusted by Provisional Measure #790/2017 (which vary from R\$2,000.00 to R\$60,000,000.00 as per the new wording of article 64 of the Mining Code) shall be imposed from January 1<sup>st</sup>, 2018. Until that date, the fine amount that may be applied by DNPM/ANM as a result of failure in the presentation of DIPEM is limited to the maximum value of R\$3,239.26 (three thousand two hundred thirty-nine Brazilian reais and twenty-six cents).

It is important to highlight that CBC submitted to DNPM the final exploration report regarding this mineral right on September 10, 2012<sup>6</sup> due to a strike that occurred at DNPM in the period from July 16, 2012 to September 4, 2012. In view of DNPM's Administrative Rules #382/2012 and 415/2012<sup>7</sup>, the final exploration report shall be considered to be timely submitted to DNPM. Nevertheless, DNPM issued an opinion on January 19, 2017 indicating that the final exploration report was presented late to DNPM. In view of this opinion, CBC submitted to DNPM an administrative impugnation on March 14, 2017 in order to revert this understanding and obtain the approval of its final exploration report. As per information provided by Águia Fertilizantes, the Company recently held a meeting with DNPM representatives in order to address the issue and, at the occasion, DNPM's agents verbally recognized that their understanding was mistaken and shall be rectified. Despite of this fact, DNPM has not issued any formal decision regarding the matter up to the date hereof.

---

<sup>6</sup>The Exploration Permit expired on August 16, 2012.

<sup>7</sup>DNPM's Administrative Rules #382/2012 and 415/2012 regulate procedures and deadlines during the strike that took place at DNPM from July 16, 2012 to September 4, 2012.

It is worth mentioning that CFEM is not due in the current stage of the Mineral Rights.

- E. **International Border Zone.** The Mineral Rights are located within the international border area, which means that, prior to performing exploration and exploitation activities, the titleholder must obtain the necessary authorization before the National Defense Council (“NDC”), pursuant to Federal Law #6.634/1979 and Decree #85.064/1980.

In order to obtain the mandatory authorization of the NDC, the companies interested in performing mining activities within border areas shall expressly assure in their respective by-laws that (i) at least 51% (fifty-one per cent) of the company’s share capital belong to Brazilians; (ii) at least 2/3 (two thirds) of the employees involved in the mining activities are Brazilian individuals; and (iii) the management of the company is exercised by a majority of Brazilian individuals.

According to Águia Fertilizantes bylaws and information provided by the Company’s representatives, **(i)** the majority (51%) of Águia Fertilizantes’ capital is held by BS1 Mineração Ltda., a Brazilian limited liability company; **(ii)** the control is exercised by BS1 Mineração Ltda; **(iii)** the management of the company is performed by Mr. Fernando Henrique Bucco Tallarico and Mr. Helio Botelho Diniz, both Brazilian citizens, who were appointed for an additional 3-year term on March 10, 2017. Noteworthy that, pursuant to Águia Fertilizantes’ representatives, the Company requested NDC’s consent concerning the appointment of the managers on September 1, 2017<sup>8</sup>, (as per Decree #85,064/1980, article 21, II). Even though the decision of NDC is still pending, we do not foresee any reasons that could prevent Águia Fertilizantes from obtaining NDC’s consent with regards to the appointment of the managers; **(iv)** article 24 of Águia Fertilizantes bylaws provides that at least 2/3 of the employees shall always be Brazilian citizens, and **(v)** the Company has granted powers of attorney (a) through public instrument to Alfredo Rossetto Nunes (Brazilian citizen) to, exclusively, represent the Company before private companies in order to sign agreements which values do not exceed the amount in Brazilian Reais correspondent to U\$D100,000.00 (one hundred thousand American dollars); Rita de Cassia Meott and Zargos Gandara Hood (both Brazilian citizens) to, exclusively, represent the Company before financial institutions; and Rita de Cassia Meott (Brazilian citizen) to, exclusively, act on behalf of the Company on labor issues (power of attorney valid until December 31, 2017) and (b) through private instrument to Lucas Mendes Galinari (also Brazilian citizen) to individually represent the Company before the National Department of Mineral Production (power of attorney valid until December 31, 2017) and to Alfredo Rossetto Nunes and Lucélia Moema Carneiro (both Brazilian citizens) to individually represent the Company before government offices, authorities, committees and private companies.

In view of this, we understand that Águia Fertilizantes is in compliance with the requirements stipulated in Brazilian Federal Law #6,634/1979 for the ownership of mineral rights located within Brazilian border areas and, thus, for the performance of mining activities within the Brazilian border areas. Furthermore, on April 4<sup>th</sup>, 2014, NDC granted to Águia Fertilizantes a general

---

<sup>8</sup>The General Annual Meeting and Extraordinary General Meeting of Águia Fertilizantes held on March 10, 2017 also approved (i) the financial statements (including the balance sheet) of the Company and the administration report regarding the financial year finished on December 31<sup>st</sup>, 2016 and (ii) the reinstatement of the Company’s bylaws. The Minutes concerning the General Annual Meeting and Extraordinary General Meeting of Águia Fertilizantes shall be registered before the Registry of Companies of the State of Minas Gerais following the obtainment of NDC’s consent.

consent to establish the Company within the border area of the State of Rio Grande do Sul. In addition, the Company is being contemplated with individual consents for the performance of exploration activities within the areas of the Mineral Rights, as prescribed in the applicable legislation.

The status of the issuance of consents by NDC regarding each of the Mineral Rights are indicated below:

*Mineral right #810.090/1991:* the NDC's consent for the assignment of the mineral right from CBC to Águia Fertilizantes was granted on August 31<sup>st</sup>, 2017. Nonetheless, DNPM has not issued its decision on the approval of the assignment up to date. Even though it is not possible to estimate the timeframe for the issuance of DNPM's decision, we do not foresee any reasons that could prevent Águia Fertilizantes from obtaining DNPM approval on the assignment of this mineral right.

It is worth highlighting that, until NDC's consent and DNPM's approval on the assignment of this mineral right, the performance of exploration activities within the area covered by this mineral right by Águia Fertilizantes shall be conducted by the Company in the name of CBC (through a valid power of attorney granted by CBC), as stipulated on DNPM's Ordinance #155/2016, article 256.

*Mineral right #810.988/2011:* the NDC's consent for the assignment of the mineral right from Falcon to Águia Fertilizantes is still pending. Even though it is not possible to estimate the timeframe for the issuance of NDC's consent, we do not foresee any reasons that could prevent Águia Fertilizantes from obtaining NDC consent and DNPM approval on the assignment of this mineral right.

It is worth highlighting that, until NDC's consent and DNPM's approval on the assignment of this mineral right, the performance of exploration activities within the area covered by this mineral right by Águia Fertilizantes shall be conducted by the Company in the name of Falcon (through a valid power of attorney granted by Falcon), as stipulated on DNPM's Ordinance #155/2016, article 256.

*Mineral right #810.325/2012:* the consent for the assignment of the mineral right from CBC to Águia Fertilizantes was granted by NDC on June 6<sup>th</sup>, 2016. The assignment has not been approved by DNPM up to date. Even though it is not possible to estimate the timeframe for the issuance of DNPM's decision, we do not foresee any reasons that could prevent Águia Fertilizantes from obtaining DNPM approval on the assignment of this mineral right.

- F. **Interference of the Mineral Rights with restricted areas.** According to the information provided by Águia Fertilizantes' representatives and data disclosed on the Mining Register, the area regarding the Mineral Rights is not located within: (i) areas occupied by indigenous, traditional and/ or *Quilombola* communities; or (ii) areas allocated for agrarian reform settlement by the National Institute for Colonization and Agrarian Reform (*Instituto Nacional de Colonização e Reforma Agrária - INCRA*). Also, it is important to highlight that, as we were informed, there are no irregular activities or occupations being performed by small-scale miners ("garimpeiros") in the

areas covered by the Mineral Rights.

- G. **Surface owners.** Pursuant to the information provided by Águia Fertilizantes' representatives, the Company was verbally authorized by surface owners to enter the property to perform exploration activities, but Águia Fertilizantes did not enter into any writing agreement with any surface owner. However, all payments made by Águia Fertilizantes in favor of surface owners have been documented with written receipts. The detailed information regarding such payments as a result from the eventual indemnification and compensation for the use of the land is described in Exhibit D. Furthermore, as informed by Águia Fertilizantes' representatives, the Company does not hold title over any real estate property that covers the mineral rights' areas.
- H. **Royalties agreement with Sulliden Mining Capital Inc.** On November 3<sup>rd</sup>, 2014, Águia Resources Ltd. ("AGR") and its subsidiaries Águia Metais, Águia Rio Grande Mineração Ltda. ("Águia Rio Grande") and Potássio do Atlântico Ltda. ("Potássio do Atlântico") (together referred to as "AGR and its subsidiaries") entered into an Offer Letter and Agreement with Sulliden Mining Capital Inc., through which, in consideration for an aggregate purchase price of AUS\$2,000,000 (two million Australian dollars), **(a)** Sulliden subscribed for 40,000,000 (forty million) shares of AGR (which were issued in favor of Sulliden Mining Capital Inc. on November 13, 2014) and **(b)** AGR and its subsidiaries offer to grant a 1% (one per cent) net smelter returns royalty in respect to the so called *Property*, which comprises, among others, the Mineral Rights. As established in the Agreement, the "net smelter returns" shall mean the actual proceeds received from any custom smelter, mill, mint, beneficiator, processing plant or other purchaser for the sale of all minerals, metals, concentrates or other phosphate extracted and derived from the ore mined from the *Property*. It is worth to highlight that such agreement is not governed by Brazilian law. Considering that there is not a deadline regarding royalties payment in the agreement, it should be understood that Sulliden Mining Capital Inc. will have this right up to the end of the exploitation of the mineral rights comprised by the so called *Property*.

Sincerely,

  
Azevedo Sette Advogados

Brazilian law firm registered with the Brazilian Bar  
Association – Minas Gerais Section under no. 213

EXHIBIT A

1 TITLE

1.1. Mineral Rights Chart

1.1.1 For the purpose of this opinion, we have examined the mineral rights identified by the DNPM's files number listed on the chart below (the "**Mineral Rights**"):

#	Mineral Right DNPM #	Location City or District	Mineral	Area (ha)	Process Phase/Status	Title Holder / Applicant	Expiration date	Note
1.	810.090/1991	Lavras do Sul	Gold Phosphate <sup>9</sup>	1,000.00	Exploration Permit	CBC / Águia Fertilizantes (assignee)	August 16, 2012	<p><b>Exploration Permit.</b> Exploration permit granted to CBC by the DNPM on April 12<sup>th</sup>, 2006. On August 16<sup>th</sup>, 2010, DNPM authorized the extension of the exploration permit for an additional 2 (two) year term, as requested by CBC. Thus, the exploration permit expired on August 16<sup>th</sup>, 2012.</p> <p><b>Final Exploration Report.</b> On September 10<sup>th</sup>, 2012, CBC submitted to DNPM the final exploration report concerning this mineral right. Up to the date hereof, DNPM has not issued any decision regarding the report.</p> <p>Note that due to a strike that occurred at the DNPM in the period of July 16, 2012 to September 4, 2012 and in view of DNPM's Administrative Rules #382/2012 and</p>

<sup>9</sup>Even though the Mining Register does not indicate "phosphate" as a mineral substance comprised by the respective Exploration Permit, CBC communicated to DNPM its identification within the area covered by this mineral right (detailed information regarding this topic is contained in the chart).

#	Mineral Right DNPM #	Location City or District	Mineral	Area (ha)	Process Phase/Status	Title Holder / Applicant	Expiration date	Note
								<p>415/2012<sup>10</sup>, the final exploration report shall be considered to be timely submitted to DNPM. Nevertheless, DNPM issued an opinion on January 19, 2017 indicating that the final exploration report was untimely presented late to DNPM. In view of this opinion, CBC submitted to DNPM an administrative impugnation on March 14, 2017 in order to revert this understanding and obtain the approval of its final exploration report. As per information provided by Águia Fertilizantes, the Company recently held a meeting with DNPM representatives in order to address the issue and, at the occasion, DNPM's agents verbally recognized that their understanding was mistaken and shall be rectified. Despite of this fact, DNPM has not issued any formal decision regarding the matter up to the date hereof</p> <p><b>Identification of other mineral substance.</b> On November 3<sup>rd</sup>, 2011, CBC communicated to DNPM the identification of phosphate within the area comprised by the mineral right.</p> <p><b>Assignment<sup>11</sup> of the mineral right to Águia Fertilizantes:</b> On July 1<sup>st</sup>, 2011 CBC and Águia Metais executed an option</p>

<sup>10</sup>DNPM's Administrative Rules #382/2012 and 415/2012 regulate procedures and deadlines during the strike that took place at DNPM from July 16, 2012 to September 4, 2012.

<sup>11</sup>It is important to note that, prior to the request for assignment of the mineral right to Águia Fertilizantes, CBC requested it transfer to Mineração Carmec Ltda. ("Mineração Carmec") and Mineração Terra Santa Indústria Comércio e Serviços Ltda. ("Mineração Terra Santa"), as follows:

(i) *Assignment to Mineração Carmec.* On November 14, 1996, CBC and Mineração Carmec executed an agreement providing for the assignment of this mineral right to Mineração Carmec. Also on November 14, 1996, CBC requested before DNPM the assignment of this mineral right to Mineração Carmec. In accordance to the documentation provided by

#	Mineral Right DNPM #	Location City or District	Mineral	Area (ha)	Process Phase/Status	Title Holder / Applicant	Expiration date	Note
								<p>agreement providing for the irrevocable purchase option of this mineral right by Águia Metais (or its affiliate or subsidiaries). On May 30<sup>th</sup>, 2012 Águia Metais exercised the purchase option concerning this mineral right by means of its affiliate Águia Fertilizantes. On July 20<sup>th</sup>, 2012 CBC requested before DNPM the transfer of this mineral right to Águia Fertilizantes. The request is under DNPM's analysis. On October 30, 2014, CBC reasserted, before DNPM, the assignment request in favor of Águia Fertilizantes.</p> <p><b>Complementary exploration.</b> On November 9, 2016, CBC and Águia Fertilizantes requested before DNPM an authorization for the performance of complementary exploration activities for a period not less than 90 (ninety) days. On January 30, 2017, CBC and Águia Fertilizantes reasserted the request before DNPM. Pursuant to Provisional Measure #790, 2017, after the expiration of the exploration permit, the titleholder may proceed with the exploration activities, through a prior communication to</p>

Águia Fertilizantes' local management, on December, 8, 2000, CBC requested DNPM not to consider the assignment application presented on November 14, 1996. The DNPM has not issued any official decision regarding such request. Nevertheless, the assignment to Mineração Carmec was not consummated before the DNPM and the mineral right remained under CBC's title. In addition, on June 30, 2005, CBC and Mineração Carmec terminated the assignment agreement executed on November 14, 1996.

(ii) *Assignment to Mineração Terra Santa.* On July 4, 2005, CBC and Mineração Terra Santa executed an agreement providing the assignment of this mineral right to Mineração Terra Santa. On November 22, 2005, CBC requested before DNPM the assignment of this mineral to Mineração Terra Santa. On August 31, 2007, DNPM denied the assignment and on July 7, 2009, CBC and Mineração Terra Santa terminated the assignment agreement dated of July 4, 2005.

#	Mineral Right DNPM #	Location City or District	Mineral	Area (ha)	Process Phase/Status	Title Holder / Applicant	Expiration date	Note
								<p>DNPM/ANM (including field exploration activities), as per detailed in item 1.1.17 below.</p> <p><b>Declaration of Investments in Mineral Exploration (“DIPEM”).</b> As per the documents provided, DIPEM regarding the year of 2012 was untimely submitted to DNPM by CBC on March 28, 2017. As a result of this failure, DNPM may apply to CBC penalties prescribed in article 63 of the Mining Code, such as admonition and fines. As per Provisional Measure #790/2017, regulation to be enacted shall define the criteria for the impose of sanctions, aggravating and mitigating aspects and, with regards to the administrative ordinary fines and daily fines, the economic capacity of the defaulter, as detailed in item 1.1.42. Nonetheless, the fine amounts adjusted by Provisional Measure #790/2017 (which vary from R\$2,000.00 to R\$60,000,000.00 as per the new wording of article 64 of the Mining Code) shall be imposed by DNPM/ANM from January 1<sup>st</sup>, 2018. Until that date, the fine amounts that may be applied by DNPM/ANM remain limited to the maximum value of R\$3,239.26 (three thousand two hundred thirty-nine Brazilian reais and twenty-six cents)<sup>12</sup>.</p>

<sup>12</sup>With the exception of the fines applied to DNPM/ANM with regards to non-compliance with obligations concerning exploration/exploitation of mineral water, which current values comprise up to R\$45,510.39 (forty-five thousand five hundred and ten Brazilian reais and thirty-nine cents).

#	Mineral Right DNPM #	Location City or District	Mineral	Area (ha)	Process Phase/Status	Title Holder / Applicant	Expiration date	Note
								<p><b>International Border Zone.</b> This mineral right is located within an international border area. On August 31<sup>st</sup>, 2017. NDC granted its consent for the assignment of this mineral right from CBC to Águia Fertilizantes. Nonetheless, DNPM has not issued its decision on the approval of the assignment up to date. Even though it is not possible to estimate the timeframe for the issuance of DNPM's decision, we do not foresee any reasons that could prevent Águia Fertilizantes from obtaining DNPM's approval on the assignment of this mineral right, especially considering the consent already granted by NDC for the assignment of this mineral right from CBC to Águia Fertilizantes.</p> <p><b>TAH:</b> DNPM database indicates the payments of TAH concerning the original and extended term of the exploration permit. Nevertheless, with the exception of the payment made by CBC on January 16, 2012 (which receipt indicates the regularity of the respective payment), we were not informed whether the payments made by CBC regarding the years of 2006, 2007, 2008 and 2011 comprise the total amount due.</p> <p><b>CFEM:</b> CFEM tax is not due in the current stage of <i>Três Estradas Phosphate Project</i>.</p>

#	Mineral Right DNPM #	Location City or District	Mineral	Area (ha)	Process Phase/Status	Title Holder / Applicant	Expiration date	Note
2.	810.988/2011	Lavras do Sul	Phosphate	84.39	Exploration Permit	Falcon Petróleo S.A.  Águia Fertilizantes (assignee)	April 15, 2018	<p><b>Exploration Permit.</b> Exploration permit granted to Falcon by the DNPM on April 15<sup>th</sup>, 2015.</p> <p><b>Assignment of the mineral right to Águia Fertilizantes:</b> On April 20<sup>th</sup>, 2015, Falcon requested before DNPM the transfer of this mineral right to Águia Fertilizantes. The request is under DNPM's analysis.</p> <p><b>International Border Zone.</b> This mineral right is located in an international border area. On February 13, 2015, NDC granted a consent to Falcon for the performance of mining activities regarding this mineral right. Nevertheless, it is important to note that NDC shall also issue its prior consent to the assignment of the mineral right from Falcon to Águia Fertilizantes. Even though it is not possible to estimate the timeframe for the issuance of NDC's consent, we do not foresee any reasons that could prevent Águia Fertilizantes from obtaining NDC consent and DNPM approval on the assignment of this mineral, especially considering the general consent granted by NDC to Águia Fertilizantes to establish the Company within the border area of the State of Rio Grande do Sul right.</p> <p><b>TAH:</b> Payment confirmed through public consultation at the Mining Register and analysis of documents made available by Águia Fertilizantes representatives.</p>

#	Mineral Right DNPM #	Location City or District	Mineral	Area (ha)	Process Phase/Status	Title Holder / Applicant	Expiration date	Note
								<b>CFEM:</b> CFEM tax is not due in the current stage of the <i>Três Estradas Phosphate Project</i> .
3.	810.325/2012	Lavras do Sul	Phosphate	990.95	Exploration Permit	CBC  Águia Fertilizantes (assignee)	May, 3 <sup>rd</sup> , 2020	<p><b>Exploration Permit.</b> Exploration permit originally granted to CBC by the DNPM on April 29<sup>th</sup>, 2013.</p> <p><b>Extension of exploration permit.</b> On May 3, 2017, DNPM extended the exploration permit regarding this mineral right for an additional 3 year-term. On May 23, 2017, CBC timely communicated to DNPM the recommencement of the exploration activities.</p> <p><b>Assignment to Águia Fertilizantes.</b> On July 1<sup>st</sup>, 2011 CBC and Agua Metais executed an option agreement providing the irrevocable purchase option of this mineral right by Agua Metais (or its affiliates or subsidiaries). On May 16<sup>th</sup>, 2013, Águia Metais exercised the purchase option concerning this mineral right by means of its affiliate Águia Fertilizantes. On April 7<sup>th</sup>, 2014, CBC requested before DNPM the transfer of this mineral right to Águia Fertilizantes. The request is under DNPM's analysis.</p> <p><b>Identification of other mineral substance.</b> On September 2<sup>nd</sup>, 2015, CBC communicated to DNPM the identification of calcite and dolomite within the area comprised by the mineral right.</p>

#	Mineral Right DNPM #	Location City or District	Mineral	Area (ha)	Process Phase/Status	Title Holder / Applicant	Expiration date	Note
								<p><b>International Border Zone.</b> This mineral right is located in an international border area. On June 6<sup>th</sup>, 2016, NDC issued the consent for the assignment of the mineral right from CBC to Águia Fertilizantes. As indicated above, the decision of DNPM regarding the assignment of this mineral right is still pending. Even though it is not possible to estimate the timeframe for the issuance of DNPM's decision, we do not foresee any reasons that could prevent Águia Fertilizantes from obtaining DNPM approval on the assignment of this mineral, especially considering the consent granted by NDC for the assignment of this mineral right.</p> <p><b>TAH:</b> Payment confirmed through public consultation at the Mining Register and analysis of documents made available by Águia Fertilizantes representatives.</p> <p><b>CFEM.</b> CFEM tax is not due in the current stage of the <i>Três Estradas Phosphate Project</i>.</p>

## EXHIBIT B

### 1 REGULATORY ASPECTS

#### 1.1 General overview of the Brazilian mining legislation

- 1.1.1 Pursuant to the Brazilian Constitution (article 176, first paragraph), the exploration and exploitation of mineral resources shall always occur under a specific federal authorization or concession and only Brazilian citizens or companies organized under Brazilian laws with headquarters and administrative body located in the country may be entitled to practice such activities and, therefore, explore mineral rights in Brazil.
- 1.1.2 In addition to the Constitution, mineral rights in Brazil are also governed by the Decree-Law #227 of February 28<sup>th</sup>, 1967 (the "Mining Code"), the Decree #62.943 of July 2<sup>nd</sup>, 1968 and further rules enacted by the National Department of Mineral Production ("DNPM"), which shall shortly be replaced by the Brazilian National Mining Agency (governmental agency in charge of the control of the exercise of mining activities throughout the national territory), as per detailed in item 1.1.10.
- 1.1.3 In order to regulate the exploration and exploitation of mineral resources in Brazil, the Mining Code establishes several legal regimes that shall be implemented considering the stage of mining activities, the diversity of mineral substances, the degree of difficulty of its exploitation and the destination of the production. The most common legal regimes are (i) authorization for exploration and (ii) mining concession for exploitation activities.
- 1.1.4 **Provisional measures<sup>13</sup> #789, 790 and 791/2017.** On July 25<sup>th</sup>, 2017, the Brazilian President Mr. Michel Temer enacted the provisional measures #789, 790 and 791 ("Provisional Measures"), which were published on the Brazilian Official Gazette on July 26<sup>th</sup>, 2017.
- 1.1.5 The Provisional Measures compose a package named by the current Brazilian Government as the "Revitalization Program for the Brazilian Mineral Industry" and are mainly detailed below:
- *Provisional Measure #789/2017:* comprises modifications on the Federal Laws #7,990/1989 and 8,001/1990, which regulate the collection of the Financial Compensation for the Exploitation of Mineral Resources ("CFEM"). The main legal changes are indicated on item 1.1.36 below. This Provisional Measure is in force since August 1<sup>st</sup>, 2017 except for some specific provisions that shall be in force from November 1<sup>st</sup>, 2017 and January 1<sup>st</sup>, 2018 (

---

<sup>13</sup>Pursuant to the Brazilian Federal Constitution (art. 62), the Brazilian President may enact provisional measures in cases of relevance and urgency of certain subjects. The provisional measures shall be submitted to the Brazilian National Congress immediately after their enactment in order to be converted into law. As a general rule, the provisional measures shall lose effect, since their enactment, if are not converted in law within the term of 60 (sixty) days from the publication of the provisional measures in the Brazilian Official Gazette. Such term may be extended only once for additional 60 days. Noteworthy that the National Congress (i) may approve or reject (in total or in part) the provisional measures enacted by the Brazilian President and (ii) shall rule the juridical relations that result from the provisional measures through a legislative decree.

which are indicated in the following topics, as applicable).

- *Provisional Measure #790/2017*: comprises several modifications to the Mining Code and on the Federal Law #6,567/1978, which regulates the exploitation of certain mineral substances, such as gravel and sand. The main legal changes are indicated along the following topics. This Provisional Measure is in force since July 27<sup>th</sup>, 2017 with regards to its major content(except for some specific provisions which shall be in force from January 1<sup>st</sup>, 2018 and are indicated in the following topics, as applicable).. Furthermore, such Provisional Measure revokes certain provisions of the Mining Code which will be indicated in the following topics, as applicable.
- *Provisional Measure #791/2017*: creates the Brazilian National Mining Agency (*Agência Nacional de Mineração - ANM*) which replaces the National Department of Mineral Production (DNPM). The main legal aspects of ANM are indicated on item 1.1.6 below. This Provisional Measure is in force since July 27<sup>th</sup>, 2017, apart from articles 24<sup>14</sup> and 36, II<sup>15</sup> which shall be in force from January 1<sup>st</sup>, 2018. Furthermore, such Provisional Measure revokes Federal Law #8,876/1994 (which creates the DNPM) and article 26, 4<sup>th</sup> paragraph of the Mining Code<sup>16</sup>.

1.1.6 **Brazilian National Mining Agency (*Agência Nacional de Mineração - ANM*)**. ANM is an autarchy subject to a special public regime which means that the Agency is invested with greater administrative and financial autonomy than the one granted to DNPM along its existence. ANM is also bound to the Ministry of Mines and Energy.

1.1.7 The internal structure of the ANM differs from the former structure of DNPM (especially regarding job positions and the respective salaries). ANM shall be composed by a board of directors, comprised by 1 (one) general-director and 4 (four) directors, who shall be indicated by the Brazilian President and approved by the Brazilian Senate. The members of the board of directors shall remain in function for a maximum term of 5 (five) years.

1.1.8 The eligible individuals for the board of directors shall meet the following requirements: (i) minimum experience of (a) at least 10 (ten) years of experience on superior command on public or private players related to the mining sector; or (b) 4 (four) years on relevant job positions on the mining sector (such as director of mining company or professor or researcher on mining subjects, for instance); or (c) 10 (ten) years as an independent professional on the mining sector; and (ii) academic qualification compatible with the indicated position.

1.1.9 The Agency headquarters shall be situated in Brasília with regional administrative offices located

---

<sup>14</sup>Stipulates the obligation for payment of the so called Tax for the Inspection of Mineral Activities ("TFAM"), which shall be collected by ANM from January 1<sup>st</sup>, 2018.

<sup>15</sup>Stipulates that the inspections made by DNPM, under its regular inspection routine, shall be afforded by the respective titleholders or applicants who are the interested parties in the performance of such inspections by DNPM. Noteworthy that, from January 1, 2018, the values paid as Tax for the Inspection of Mineral Activities shall cover the costs and expenses involved in the performance of such inspections.

<sup>16</sup>See footnote above.

throughout the national territory.

- 1.1.10 The effective installation of ANM currently depends on the enactment of a decree by the Brazilian President which shall also set forth the internal rules of the Agency. Such decree has not been enacted up to the date hereof. Meanwhile, the structure of DNPM remains active and operational.
- 1.1.11 Among the revenues that compose the budget of ANM, the Provisional Measure #791/2017 stipulates the obligation for the payment of a new tax named as the Tax for the Inspection of Mineral Activities (“TFAM”) which shall be paid by the titleholders per each mineral right until April 30<sup>th</sup> of each year. Noteworthy that applicants of mineral rights are not compelled to collect such tax.
- 1.1.12 The tax amounts vary from R\$500.00 (five hundred Brazilian reais) to R\$3,000.00 (three thousand Brazilian reais) per mineral right. The due amount depends on the stage of each process. For instance, holders of mineral rights in phase of exploration permit which final exploration report has not been submitted to DNPM/ANM yet shall collect the tax at the amount of R\$2,000.00 (two thousand Brazilian reais) for this specific mineral right. Therefore, the total amount due by each titleholder shall comprise the sum of all the values due individually for each mineral right entitled considering their stage at January 1<sup>st</sup> of the year of payment.
- 1.1.13 Provisional Measure #791/2017 expressly provides for the jointly liability for the collection of TFAM between (i) lessor and lessee (along the term of the lease agreement) and (i) assignor and assignee for eventual debts regarding dates prior to the register of the respective assignment.
- 1.1.14 Eventual lack of payment or untimely payment of TFAM subjects the debtor to the payment of fines equivalent to 50% of the TFAM value due. Moreover, the debtor shall also be compelled to the payment of the TFAM value with monetary adjustment, interest and fine, as per article 61 of Law #9,430/1996 (which regulates federal tax legislation, among other provisions). It is worth highlighting that the TFAM shall be collected from January 1<sup>st</sup>, 2018.
- 1.1.15 **Authorization for exploration.** As set forth in article 14 of the Mining Code and article 18 of the Decree, mineral exploration comprises the necessary works performed in order to measure and evaluate a mine and its technical and economic feasibility. The mentioned legislation also determines that the exploration may be carried out by means of on-site and laboratory works, geological and geophysical studies, and any other type of research works.
- 1.1.16 DNPM/ANM grants the authorization to an interested party by means of a specific title named “Alvará de Pesquisa” (the “Exploration Permit”). It should be emphasized that such document allows the performance of exploration works in the area, which means that the titleholder shall not exploit the area until the mining concession is granted. Nevertheless, as stipulated in the Mining Code (article 22, 4<sup>th</sup> paragraph), DNPM/ANM may exceptionally authorizes the performance of exploitation activities during the exploration phase or, in other words, before the issuance of the mining concession under some exceptional circumstances set forth in article 102 of DNPM’s Administrative Rule #155/2016 (such as, for instance, the need of the titleholder to assess the technical and economic feasibility of the mineral substance in the national and/or international

markets before the obtainment of the mining concession). For this purpose, the titleholder shall be granted with a special document named as “*Guia de Utilização*”<sup>17</sup>.

- 1.1.17 In order to obtain the Exploration Permit, the titleholder shall file an application before DNPM, according to the provisions established in articles 16 *et. seq.* of the Mining Code. After the analysis of the application, DNPM/ANM may issue the Exploration Permit that shall be valid for a period of two to four years (as per Provisional Measure #790/2017). As established in article 22, III, of the Mining Code, this period may be extended once, subject to the analyses of the exploration development by DNPM/ANM. Pursuant to the Provisional Measure #790/2017, after the expiration of the exploration permit, the titleholder may proceed with the exploration activities, through a prior communication to DNPM/ANM (including field exploration activities). The information and data obtained through the performance of such additional works shall be considered for the preparation of the plan of economic exploitation, but shall not be used to rectify or complement the final exploration report already submitted to DNPM/ANM<sup>18</sup>.
- 1.1.18 It is worth to mention that the titleholder is entitled to perform the exploration and exploitation of all mineral substances which exist within the area covered by the respective mineral right. Therefore, the mining legislation does not prevent the titleholder from exploring a mineral substance not expressly included under the scope of the exploration permit. Nevertheless, in this case, the titleholder shall promptly communicate to DNPM the identification of a new mineral substance within the area and include in the respective final exploration report the technical data regarding the exploration works performed in connection with the additional mineral substance(s). As per the Mining Code (article 47, 1st and 2<sup>nd</sup> paragraphs), the mining right holder may exploit additional mineral substances (originally not mentioned in the mining title) upon their prior register in the respective mining title.
- 1.1.19 The Mining Code (article 20 and 22) also sets forth that the holder of the Exploration Permit, among other rights and obligations, (i) may assign or transfer it, provided that the assignee fulfills the legal conditions to hold the title; (ii) may, at any time, waive, partially or totally, the Exploration Permit

<sup>17</sup>For the obtainment of the so called “*Guia de Utilização*”, DNPM’s Ordinance #155/2016 (article 107) stipulates the following: Art. 107 – The request for the issuance of *Guia de Utilização* shall only be approved whether the titleholder:

I – presents to DNPM all the documents listed in article 104; II – is duly in compliance with the payments of Annual Tax per Hectare; III – presents to DNPM the environmental license required or an equivalent document;

Similarly, as per the Ordinance #237/1997 issued by the National Environmental Council, the Brazilian legislation requires environmental licensing procedures for activities of exploitation and mineral processing, including when such activities are performed in phases of exploration based on the issuance of “*Guias de Utilização*”. As a general rule, the development of exploration activities (without the performance of exploitation activities) is exempt of environmental licensing procedures, but may be subject to the obtainment of specific authorizations in case such activities involve or demand environmental interferences considered relevant by the applicable legislation (examples: intervention in environmental protected areas, vegetation removal etc). In the state of Rio Grande do Sul, such provisions are also contemplated by State Law #11,520/2000 and Resolution #275/2012 enacted by the local environmental agency (FEPAM).

<sup>18</sup>Until the enactment of Provisional Measure #790/2017, the Mining Code did not comprise any legal provisions regulating the possibility to perform additional exploration activities after the expiration of the exploration permit. Nevertheless, DNPM issued many opinions recognizing the possibility of granting the authorization for the development of complementary activities (such as, for instance, Opinion PROGE #59/2004; Opinion #16/2006-PF-3aDS/DNPM/MG-MAH; Opinion PF3oDS/DNPM/MGn.5-1/2010-OC).

It is worth to mention that on November 9, 2016, CBC and Águia Fertilizantes requested before DNPM an authorization for the performance of complementary exploration activities for a period not less than 90 (ninety) days. On November 18, 2016, DNPM issued a declaration indicating that CBC may execute additional exploration activities in order to obtain detailed information that might support future exploitation projects. On January 30, 2017, CBC and Águia Fertilizantes reasserted the request before DNPM and DNPM has not analyzed this application before the enactment of the Provisional Measure.

(which shall be effective on the date of the protocol of the waive before DNPM/ANM with the consequent release of the respective area, as per the Provisional Measure #790/2017); (iii) shall be exclusively responsible for damages caused to third parties as a result of the performance of the exploration; (iv) shall submit to DNPM a detailed report on the exploration works prior to the final term of the Exploration Permit, (v) shall submit to DNPM, annually (up to April 30<sup>th</sup>), the Declaration of Investments in Mineral Exploration (“DIPEM”) and (vi) shall pay to DNPM the Annual Tax per Hectare (“TAH”), which is due until the submission of the final exploration report to DNPM. The Annual Tax per Hectare is charged at the amount of: (i) R\$3.21 (three Brazilian reais and twenty-one cents) per hectare, during the effectiveness of the authorization in its original term and (ii) R\$4.86 (four Brazilian reais and eighty-three cents) per hectare, under the extended term of the authorization. In case of default, DNPM may apply fines. If the fines are not duly paid, DNPM may even cancel the exploration permit (Mining Code, articles 20 and 64).

- 1.1.20 Pursuant to Provisional Measure #790/2017, regulation to be enacted by DNPM/ANM shall govern the values, terms and criteria for the collection of TAH (at a minimum amount of R\$3.00 per hectare). Moreover, DNPM/ANM may stipulate progressive values of TAH as per the mineral substance, extension and location of the area, among other conditions.
- 1.1.21 As per Opinion 228/2016/CAM/PF-DNPM-SEDE/PGF/AGU, DNPM understands that the term of loss of procedural right to initiate a recovery procedure regarding nonpaid amounts of TAH is 10 (ten) years from the date of expiration of the payment obligation. With regards to the mineral right #810.090/1991, it is worth highlighting that we were not informed whether the payments made by CBC regarding the years of 2006, 2007, 2008 and 2011 comprise the total amount due. Under the scope of the Opinion 228/2016/CAM/PF-DNPM-SEDE/PGF/AGU, the recovery procedures regarding eventual irregularities on TAH payments due specially in the year of 2006 may be considered lapsed. Nevertheless, in case Águia Fertilizantes (in the condition of assignee of the mineral right) is charged for the payments of TAH amounts due by CBC in the past, Águia Fertilizantes may demand that CBC reimburses all the expenses paid by the Company, whether such possibility is stipulated on the respective assignment agreement executed by the parties.
- 1.1.22 In accordance with Provisional Measure #790/2017, DNPM/ANM may demand the titleholder to present a biannual technical report on the progress of the exploration activities, as further stipulated on ordinances to be enacted by DNPM/ANM.
- 1.1.23 **Partial exploration report.** The titleholder may submit to DNPM partial exploration reports up to 60 (sixty) days before the expiration dates of the original authorizations, in case the titleholder intends to request the extension of any exploration permit. Pursuant to the Provisional Measure #790/2017, the exploration permit may be extended only for one additional term. Nevertheless, the exploration permit may be successively extended in case of (i) constraints for the access to the real estate property comprised by the mineral right area or (ii) absence of authorization of license of the environmental licensing agency in order to perform the exploration activities. On both scenarios, the titleholder shall prove that (i) fulfilled all duties connected to (a) eventual lawsuit to obtain access to the real estate property or (b) eventual administrative licensing procedure and (ii) did not contribute, through any act or omission, for the non-obtainment of the necessary access or environmental license.

- 1.1.24 It is important to highlight that the term of the exploration permits may vary from 2 (two) to 4 (four) years. In addition, the new term extended by DNPM shall not be superior (and may be inferior) than the original term of the exploration permit. In accordance with Provisional Measure #790/2017, the exploration permit shall remain in force until DNPM/ANM issues the decision on the extension of the exploration permit and in case the respective request is timely submitted,
- 1.1.25 **Final exploration report.** Pursuant to the Provisional Measure #790/2017, the definition of the mineral deposit shall be indicated as further stipulated on ordinances to be enacted by DNPM/ANM, necessarily based on standards internationally accepted for the declaration of mineral results. After the analysis by DNPM of the final exploration report, the agency shall decide, based on articles 23 and 30 of the Mining Code, whether or not the development is technically and economically feasible. DNPM shall not approve the final exploration report in case the work performed is insufficient or in case of technical deficiencies in the report.
- 1.1.26 As per the Provisional Measure #790/2017, as a result of any technical deficiencies in the report, DNPM/ANM may issue requirements (*exigências*) to be fulfilled by the titleholder within a 60-day term (subject to extension whether the request is submitted to DNPM/ANM within the original term for the fulfillment of the requirement). In case the requirement is not timely fulfilled, the titleholder shall be (i) compelled to pay fines up to R\$5,000.00 (five thousand Brazilian reais)<sup>19</sup> and (ii) granted with an additional 60-day term for the fulfillment of the requirement. Whether the titleholder still does not comply with the requirements, the final exploration report shall not be approved and the area shall be available for third parties in accordance with a bid procedure.
- 1.1.27 Provisional Measure #790/2017 stipulates that the areas considered available for third parties through a decision of DNPM/ANM or Ministry of Mines and Energy shall be subject to bid procedures as per ordinances to be enacted by DNPM/ANM. However, the basic criteria for such bid procedures have already been stipulated on such Provisional Measure: The areas shall be available through a specific electronic auction, under which the criteria for the judgment shall be based on the higher payment value offered for the obtainment of the mineral right over such areas. In case the value is not entirely and timely paid, the winner shall (i) lose the priority right over the area, (ii) be compelled to pay fines at the amount of fifty per cent of the minimum price (unless otherwise stipulated on the auction notice) and (iii) be temporarily suspended, for 2 (two) years, from applying for areas available under bid procedures or over priority criteria.
- 1.1.28 In case the final exploration report is not timely submitted to DNPM, the respective titleholder shall lose title over the mineral right and shall also be compelled to pay a fine to DNPM in the amount R\$2,000,00 (two thousand Brazilian reais) plus the amount of R\$3.21 (three Brazilian reais and twenty-one cents) per hectare of the area originally comprised by the mineral right. Noteworthy that, pursuant to Provisional Measure #790/2017, the values, terms and criteria for the collection of TAH shall be governed by DNPM/ANM under regulation to be enacted, which may stipulate progressive values of TAH as per the mineral substance, extension and location of the area, among other conditions. In case of non-presentation of the final exploration report or non-approval

---

<sup>19</sup>In such case, DNPM will impose fines at the amount of up to R\$5,000.00 until the enactment of specific regulation that shall define the criteria for the impose of sanctions, aggravating and mitigating aspects and, with regards to the administrative ordinary fines and daily fines, the economic capacity of the defaulter, as detailed in item 1.1.41.

of the final exploration report, the area covered by the mining title shall be considered available for application of third parties through a bid procedure, as indicate on item 1.1.27.

- 1.1.29 If the exploitation is considered to be technically and economically feasible, DNPM shall approve the final exploration report and the titleholder shall apply for the mining concession in one-year term from the approval of the final exploration report (extension of such term is possible). In case the mining concession application is not timely submitted to DNPM, the titleholder shall lose title over the mineral right. As a result, the area covered by the mining title shall be considered available for application of third parties through a bid procedure, as indicate on item 1.1.27.
- 1.1.30 **Mining Concession.** After DNPM's approval of the final exploration report, the interested party (which shall be the holder of the exploration permit or an eventual assignee) shall apply for the mining exploitation concession, which is granted by Brazil's Ministry of Mines and Energy by means of a specific title named "Concessão de Lavra" (the "Exploitation Permit" or "Mining Concession"). Prior to the grant of the Mining Concession, DNPM shall verify if the legal requirements have been fulfilled, such as the prior exploration and the approval of the report by DNPM. Noteworthy that article 37 of the Mining Code establishes no limitation to the number of concessions that may be granted to a single company.
- 1.1.31 Under the ordinary process, the mining concession applicant has the sole right to obtain the mining concession after the approval of the respective final exploration report. The grant of the mining concession in favor of the applicant is subject, for instance, to the prior exploration of the area and the approval of the respective final exploration report and technical and economic feasibility of the exploitation activities to be developed, as well as to the submission of a mining concession application in accordance with the mandatory content prescribed in articles 38 and 39 of the Mining Code.
- 1.1.32 As per the Provisional Measure #790/2017, the mining concession applicant shall have a 60-day term for the fulfillment of additional requirements in order to support the application and prove the request of the environmental license before the competent environmental authority. In case the requirement is not timely fulfilled, the titleholder shall be (i) compelled to pay fines up to R\$5,000.00 (five thousand Brazilian reais)<sup>20</sup> and (ii) granted with an additional 60-day term for the fulfillment of the requirement. Whether the titleholder still does not comply with the requirements, the mining concession application shall not be approved and the area shall be available for third parties in accordance with a bid procedure, as indicated on item 1.1.27.
- 1.1.33 Once the titleholder proves to DNPM/ANM the submission of the request for environmental license before the environmental competent agency, the titleholder shall demonstrate, biannually, that the environmental procedure is in progress and that the titleholder is implementing all the measures of the obtainment of the environmental license. In case of non-compliance with such obligation, the titleholder may lose title over the respective area.

---

<sup>20</sup>In such case, DNPM will impose fines at the amount of up to R\$5,000.00 until the enactment of specific regulation that shall define the criteria for the impose of sanctions, aggravating and mitigating aspects and, with regards to the administrative ordinary fines and daily fines, the economic capacity of the defaulter, as detailed in item 1.1.41.

- 1.1.34 Once issued the Mining Concession, among other rights, the mining right holder shall have the right to: (i) exploit the mine until its exhaustion; (ii) assign or transfer the title, provided that the assignee fulfills the legal conditions to hold the title; and (iii) waive the Exploitation Permit, subject to authorization by DNPM/ANM.
- 1.1.35 Articles 47 and 49 of the Mining Code stipulates that the mining right holder shall (i) exploit the mine according to an exploitation plan previously approved by DNPM; (ii) not interrupt the exploitation works for a period of more than six consecutive months after the beginning of the operation; (iii) exploit only minerals expressly mentioned in the Mining Concession; (iv) comply with the applicable Environmental Law; and (v) pay a Financial Compensation for the Exploitation of Mineral Resources ("CFEM"). As per the Mining Code (article 47, 1st paragraph), the mining right holder may exploit additional mineral substances (originally not mentioned in the mining title) upon their prior register in the respective mining title.
- 1.1.36 **CFEM.** Provisional Measure #789/2017 sets forth several modifications on the legal regime of CFEM. Pursuant to such Provisional Measure, in case of sale of the mineral production, CFEM is levied on the gross revenues resulting from the sale of raw or improved mineral at a rate of 2% (two percent) for "other mineral substances", such as phosphate and gold. Its calculation base is the gross revenue from the sale of the mineral product, understood as the total of sales less taxation that arises from the commercialization of the mineral product and are paid or compensated in accordance with any applicable tax regimes.
- 1.1.37 Provisional Measure #789/2017 expressly provides for the jointly liability for the collection of CFEM between (i) lessor and lessee (along the term of the lease agreement) and (i) assignor and assignee for eventual debts regarding dates prior to the register of the respective assignment.
- 1.1.38 The lack of payment of CFEM or its payment in noncompliance with the applicable regulation subjects the debtor to the payment of the amount with monetary adjustment, interest and fine, as per article 61 of Law #9,430/1996 (regulates federal tax legislation, among other provisions).
- 1.1.39 Moreover, as per Provisional Measure #789/2017, the titleholder may also be punished (through the payment of fines, for instance) by the unjustified refusal to present documents related to CFEM requested by DNPM/ANM. The fines shall correspond to 0,33% per day up to the maximum limit of 20% of the amount of CFEM considered as due by DNPM/ANM. In case of recidivism of this irregular practice, DNPM/ANM shall determine the suspension of the exploitation activities until the presentation of the documents required by DNPM/ANM, despite of fines (in double).
- 1.1.40 Furthermore, in case of refusal of presentation of documents or existence of contradictory information under the scope of the documentation provided, DNPM/ANM shall consider the information which calculation results in the major amount of CFEM due by the debtor. In case no documents are provided or the information disclosed is not sufficient for verification, DNPM/ANM may fundamentally arbitrate the values which are due by the debtor.
- 1.1.41 Provisional Measure #789/2017 also sets forth that the collection of CFEM debts are subject to the lapse terms stipulated in article 47 of Federal Law #9,636/1998 (10 years for constitution of the

debt – *decadência* – and 5 years for the respective collection - *prescrição*).

- 1.1.42 **Sanctions.** Pursuant to the Provisional Measure #790/2017 (new wording of article 63 of the Mining Code), the non-compliance with obligations set forth in the Mining Code subjects the defaulter to: (i) administrative ordinary fines; (ii) daily fines; (iii) temporary suspension, in total or in part, of the mining activities; (iv) seizure of minerals, assets and equipment; (v) loss of the mineral right (*caducidade*). Such sanctions may be jointly imposed. Regulation to be enacted shall define the criteria for the impose of sanctions, aggravating and mitigating aspects and, with regards to the administrative ordinary fines and daily fines, the economic capacity of the defaulter. Nonetheless, the fine amounts adjusted by Provisional Measure #790/2017 (which vary from R\$2,000.00 to R\$60,000,000.00 as per the new wording of article 64 of the Mining Code) shall be imposed by DNPM/ANM from January 1<sup>st</sup>, 2018.
- 1.1.43 Provisional Measure also stipulates that the fines shall vary from R\$2,000.00 (two thousand Brazilian reais) to R\$ 30,000,000.00 (thirty million Brazilian reais). In case of specific recidivism within or up to 2 (two) years, the fines shall be imposed in double. The defaulter shall be compelled to pay daily fines in case the irregular practice extends in time. Such fines may vary from R\$100.00 (one hundred Brazilian reais) to R\$50,000.00 (fifty thousand Brazilian reais), as per criteria to be defined in regulation pending of issuance. As indicated in item 1.1.42, the definition of the fine amount will be based on the severity of the infraction, on aggravating and mitigating aspects and, with regards to the administrative ordinary fines and daily fines, on the economic capacity of the defaulter, as shall be set forth on regulation pending of enactment.
- 1.1.44 The loss of the mining title (*caducidade*) shall be imposed in case of: (i) formal characterization of abandonment of deposit or mine; (ii) continue practice of ambitious exploitation activity (in despite of the impose of fines); (iii) non-compliance with repeated inspection orders, after two specific recidivism practices within 2 (two) years of the impose of fines.
- 1.1.45 The values referred to under the Provisional Measure #790/2017 (such as the fine amounts) shall be annually readjusted trough specific ordinances to be enacted by DNPM/ANM, up to the limit established by the IPCA index (*Índice Nacional de Preços ao Consumidor Amplo*) regarding the prior fiscal year. The readjusted values shall be disclosed up to the end of each January and shall be due from each May 1<sup>st</sup>.
- 1.1.46 **Assignment of the mineral rights.** Brazilian mining legislation prescribes that mineral rights may be totally or partially assigned by their owner upon DNPM's approval. Therefore, in order to be considered lawful and also to have legal effectiveness, the transfers and assignments of mineral rights shall be filed before DNPM for approval and register (Mining Code, article 55). DNPM shall analyze technical and legal aspects in order to approve the transfer or oppose it. The assignor shall continue to be liable for the mining title up to the regular register of the assignment and transfer. On the other hand, the assignee will only be effectively entitled to the mineral right after the assignment approval by the DNPM.
- 1.1.47 It is worth mentioning that assignment is not allowed to mineral rights in phase of *exploration permit application* (DNPM's Ordinance #155/2016, article 224, third paragraph).

- 1.1.48 **Mining debts.** Pursuant to the Provisional Measure #790/2017, the existence of debts enrolled (i) as overdue debts (*inscrito em dívida ativa*) or (ii) before the Registry of Credits Non-Paid (*Cadastro Informativo de Créditos Não Quitados – CADIN*) whose collectability is not suspended prevents the titleholder (debtor) from: obtaining mining titles or extension of titles' term; joining bid processes; obtaining approvals on requests of transfer or lease of mineral rights.
- 1.1.49 **Interference of the Mineral Rights with restricted areas.** According to the information provided by Aguiá Fertilizantes' representatives and data disclosed in the Mining Register, the area regarding the Mineral Rights is not located within (i) areas occupied by indigenous, traditional and/or *Quilombola* communities and (ii) agrarian reform settlement by the National Institute for Colonization and Agrarian Reform (*Instituto Nacional de Colonização e Reforma Agrária - INCRA*).
- 1.1.50 Also, it is important to highlight that, as we were informed, upon the date hereof, there are no irregular activities or occupations being performed by small-scale miners (*"garimpeiros"*) in the areas covered by the Mineral Rights.

## 1.2. Mining Activities in International Border Zones

- 1.2.1 According to the information available in DNPM's online database, the Mineral Rights are located within the Brazilian international border zone. In accordance with Brazilian legislation, the international border zones correspond to the internal extension of lands located within a 150-kilometer strip along the border of the country. Considered as essential for the defense of the national territory, such areas are especially protected, which means that their respective occupation and use are regulated by particular legislative dispositions.
- 1.2.2 Federal Law #6.634/1979 and Decree #85.064/1980, which govern the activities that may be executed in such areas, stipulate that the performance of mining (exploration and exploitation) activities within border areas shall be expressly and previously authorized by the National Defense Council ("NDC") ("*Conselho de Defesa Nacional*").
- 1.2.3 In order to obtain the mandatory authorizations of the NDC, the companies interested in performing mining activities within border areas shall expressly assure in their respective bylaws that (i) at least 51% (fifty-one per cent) of the company capital shares belong to Brazilians; (ii) at least 2/3 (two thirds) of the employees involved in the mining activities are Brazilian individuals; (iii) the management of the company is exercised by a majority of Brazilian individuals. Furthermore, the delegation of management or directory powers of the company to foreigners is forbidden, as stipulated in Decree #85.064/1980 (article 15, third paragraph).
- 1.2.4 The Brazilian Federal Attorney (*Advocacia Geral da União*) issued, on May 12<sup>th</sup>, 2004, the Opinion AC-14, through which the entity sets forth that, in order to fully comply with the provisions of Federal Law #6.634/1979, it is not sufficient that the Brazilian shareholders of the a mining company with activities or mineral rights located within international border areas hold the majority of shares, but, indeed, that the majority of shares vested with voting rights pertain to Brazilian shareholders who shall also detain the necessary powers to manage the company. In other words, the Brazilian shareholders shall exercise, in fact, the control of the mining company with activities

or mineral rights located within Brazilian border areas. It is worth noting that the Opinion AC-14 was approved by the Brazilian President<sup>21</sup> on June 1<sup>st</sup>, 2004 and published on the Brazilian Official Gazette (in connection with the approval decision) on June 4<sup>th</sup>, 2004.

- 1.2.5 According to Águia Fertilizantes bylaws and information provided by the Company's representatives, **(i)** the majority (51%) of Águia Fertilizantes' capital is held by BS1 Mineração Ltda., a Brazilian limited liability company; **(ii)** the control is exercised by BS1 Mineração Ltda; **(iii)** the management of the company is performed by Mr. Fernando Henrique Bucco Tallarico and Mr. Helio Botelho Diniz, both Brazilian citizens, who were appointed for an additional 3-year term on March 10, 2017. Noteworthy that, pursuant to Águia Fertilizantes' representatives, the Company requested NDC's consent concerning the appointment of the managers on September 1, 2017<sup>22</sup>, (as per Decree #85,064/1980, article 21, II). Even though the decision of NDC is still pending, we do not foresee any reasons that could prevent Águia Fertilizantes from obtaining NDC's consent with regards to the appointment of the managers; **(iv)** article 24 of Águia Fertilizantes bylaws provides that at least 2/3 of the employees shall always be Brazilian citizens, although we did not examine the employees' documentation under the scope of this opinion and **(v)** the Company has granted powers of attorney to (a) through public instrument to Alfredo Rossetto Nunes (Brazilian citizen) to, exclusively, represent the Company before private companies in order to sign agreements which values do not exceed the amount in Brazilian Reais correspondent to U\$D100,000.00 (one hundred thousand American dollars); Rita de Cassia Meott and Zargos Gandara Hood (both Brazilian citizens) to, exclusively, represent the Company before financial institutions; and Rita de Cassia Meott (Brazilian citizen) to, exclusively, act on behalf of the Company on labor issues (power of attorney valid until December 31, 2017) and (b) through private instrument to Lucas Mendes Galinari (also Brazilian citizen) to individually represent the Company before the National Department of Mineral Production (power of attorney valid until December 31, 2017) and to Alfredo Rossetto Nunes and Lucélia Moema Carneiro (both Brazilian citizens) to individually represent the Company before government offices, authorities, committees and private companies.
- 1.2.6 In view of this, we understand that Águia Fertilizantes is in compliance with all the requirements stipulated in Brazilian Federal Law #6,634/1979 for the ownership of mineral rights located within Brazilian border areas and, thus, for the performance of mining activities within the Brazilian border areas.
- 1.2.7 Pursuant to Decree #85.064/1980 (article 21, II), the (i) modification of the company's business purpose, name or address; (ii) election or replacement of officers or modification of their powers; (iii) modification on the capital participation of the company, increases in the company's capital and/or other share subscriptions; (iv) modifications on the type of shares and on the

---

<sup>21</sup>Complementary Law #73/1993 stipulates, on its article 40, that opinions issued by the Brazilian Federal Attorney which are approved by the Brazilian President and published in the Brazilian Official Gazette (in connection with the approval decision) shall bind the federal agencies of public administration (which become compelled to comply with its content).

<sup>22</sup>The General Annual Meeting and Extraordinary General Meeting of Águia Fertilizantes held on March 10, 2017 also approved (i) the financial statements (including the balance sheet) of the Company and the administration report regarding the financial year finished on December 31<sup>st</sup>, 2016 and (ii) the reinstatement of the Company's bylaws. The Minutes concerning the General Annual Meeting and Extraordinary General Meeting of Águia Fertilizantes shall be registered before the Registry of Companies of the State of Minas Gerais following the obtainment of NDC's consent.

quota/shareholders composition; (v) corporate restructuring, merger and acquisition; (vi) total modification of bylaws or articles of association are also subject to prior consent of the NDC, even though the interested company has already been granted with an authorization of the NDC for the performance of its mining activities.

- 1.2.8 Mining activities performed in border areas in violation of legal requirements shall be considered null and void. Besides, those responsible for the illegal works shall be punished and compelled to pay fines up to 20% (twenty per cent) of the business value involved in the economic activities irregularly practiced.

### 1.3. Surface Rights

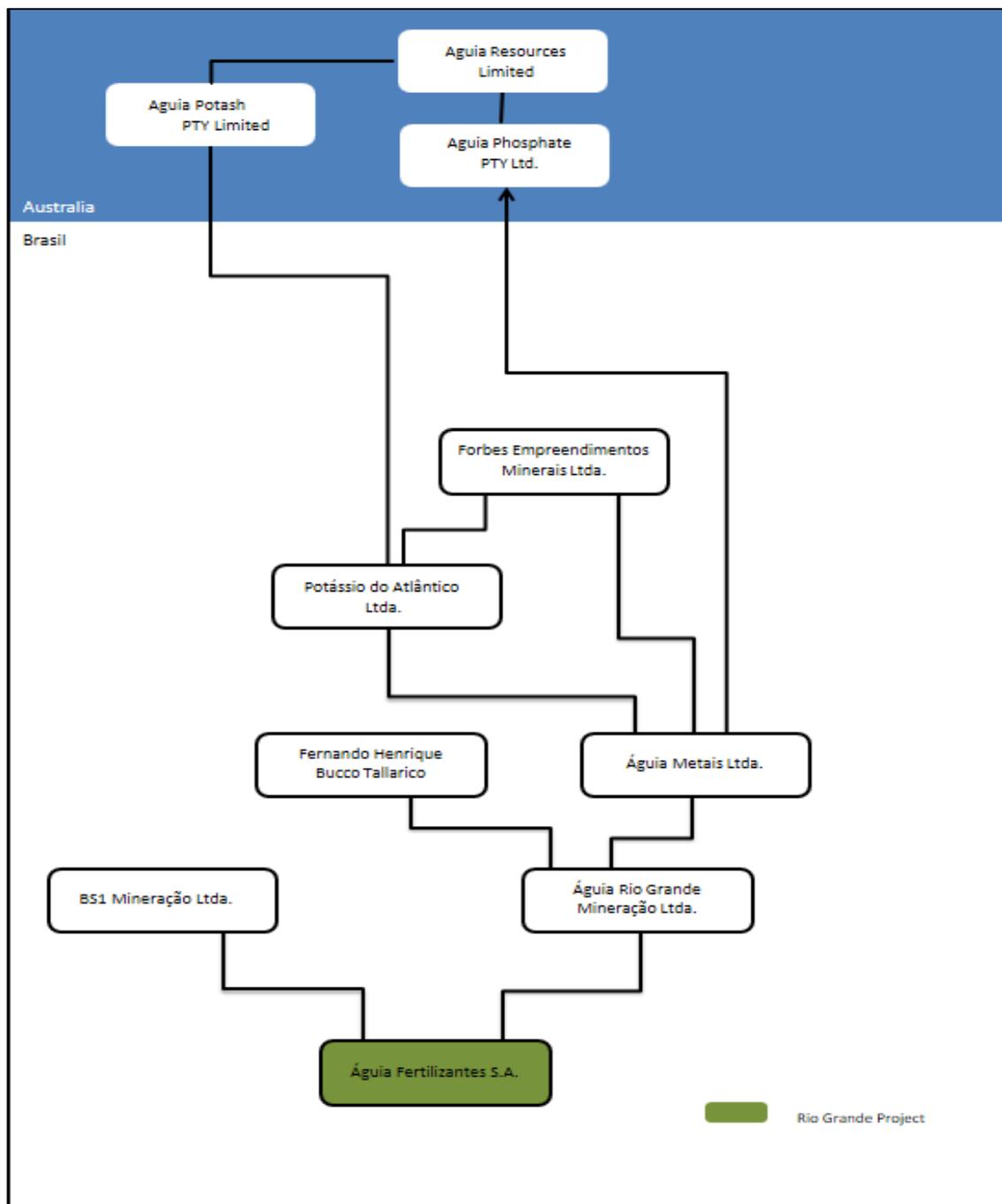
- 1.3.1 **Landowners.** In Brazil, surface rights are distinct from mineral rights and must be acquired separately. The landowner has no title to the minerals contained in the soil or in the sub-soil. The Mining Code (article 27) grants to the titleholder of an exploration permit the right to enter in the mineral right area and execute the exploration activities by means of a private agreement with the surface owner or - in case a private agreement is not reached between titleholder and landowner - by means of a judicial authorization issued through a specific lawsuit, under which the local court will guarantee the access to the area by the titleholder and define the amount of the indemnification and rent to be paid to the surface owner.
- 1.3.2 With regard to the encumbrances that shall be paid to the landowner in case of exploration, the mineral right-holder shall indemnify the losses and damages and pay compensation for the use of the land, which values shall be agreed by the parties or will be determined by the judge, in the case of a lawsuit. Furthermore, in the event of exploitation, the mineral right holder shall pay the landowner royalties at the rate of 50% (fifty percent) of CFEM, as prescribed in the Mining Code, article 11, first paragraph.
- 1.3.3 According to Brazilian Law, royalties to surface owners are payable only during the exploitation phase. Thus, considering that the Mineral Rights are currently in exploration permit phase, no royalties are currently due.
- 1.3.4 It is worth mentioning that the payments referred to above (indemnification, compensation for the use of the land and royalties) are not applicable if the titleholder is also the owner or possessor of the land in which the mining activities take place.
- 1.3.5 Pursuant to the information provided by Águia Fertilizantes' representatives, the Company did not enter into any writing agreement with any surface owner. However, all payments made by Águia Fertilizantes in favor of surface owners due to that reason have been registered in written receipts. The detailed information regarding such payments as a result from eventual indemnification and compensation for the use of the land is described in Exhibit D. Furthermore, as informed by Águia Fertilizantes' representatives, the Company does not hold title over any real estate property that covers the mineral rights' areas.

EXHIBIT C

1 CORPORATE STRUCTURE OVERVIEW OF AGR

1.1 Organizational chart of AGR and subsidiaries

1.1.1 As informed by AGR representatives, the corporate structure overview of AGR is represented by the following chart:



## 1.2 ÁGUIA FERTILIZANTES

1.2.1 As to the corporate standing of Águia Fertilizantes, based on our analysis of the corporate documents and additional information provided by the Company representatives, to the extent of our knowledge, we understand that:

- a) Águia Fertilizantes is a company organized and existing under the laws of Brazil, in the State of Minas Gerais, with its bylaws duly registered at the Registry of Companies of the State of Minas Gerais on February 24, 2012.
- b) Águia Fertilizantes was incorporated on January 18, 2012 and is registered before the Registry of Companies of the State of Minas Gerais under #313.000.9959-8 and before the Brazilian Federal Revenue Office under #15.110.334/0001-95. The Company is also registered before the Municipality of Belo Horizonte under #0442.359/001-7. As per information obtained through public consultation on the online system of the Treasury Office of the State of Minas Gerais, the Company is not registered before the State of Minas Gerais<sup>23</sup>.
- c) The Company is headquartered in the State of Minas Gerais, Municipality of Belo Horizonte, at Antônio de Albuquerque Street, 156, room 1510, Funcionários, Zip Code 30.112-010 and has no branches.
- d) The registered corporate capital of Águia Fertilizantes is R\$9,710,300.00 (nine million seven hundred and ten thousand three hundred Brazilian Reais), represented by 20,000 (twenty thousand) shares, of no par value, which are divided into 19,991 (nineteen thousand nine hundred and ninety-one) common shares and 9 (nine) preferred shares. As prescribed in the Company's bylaws, the preferred shares shall not have voting rights (except in the circumstances provided for in the Brazilian Corporate Law and shall have the following rights: (i) priority in the profit distribution in the minimum amount equivalent to, each one, 10% (ten percent) of the net profits of the Company, which shall be cumulative; (ii) priority in the reimbursement of capital without an award, and (iii) right to receive dividends in the account of capital reserve when the Company's profit is not enough to pay it.
- e) The current shareholders holding all of the registered and issued capital of Águia Fertilizantes are:
  - (i) BS1 Mineração Ltda., a Brazilian limited liability company with headquarters located at the Antônio de Albuquerque Street, 156, room 1506, Funcionários, Zip Code #30.112-010, Belo Horizonte, Minas Gerais, registered before the Brazilian Federal Revenue Office under # 15.557.634/0001-17, with 10,200 (ten thousand and two hundred) common shares and
  - (ii) Águia Rio Grande Mineração Ltda., a Brazilian limited liability company with headquarters located at the Antônio de Albuquerque Street, 156, room 1507, Funcionários, Zip Code #30.112-010, Belo Horizonte, Minas Gerais, registered before the Brazilian Federal Revenue Office under # 15.584.804/0001-52, with 9,791 (nine thousand seven hundred ninety-one) common shares and 9 (nine) preferred shares, as indicated in the chart below.

---

<sup>23</sup> The register of the company before the State of Minas Gerais is an ancillary tax obligation. The absence of registration may subject the company to the payment of fines (R\$1.625,70).

Shareholder	Number of Common Shares	Number of Preferred Shares	Percentage (%)
Águia Rio Grande Mineração Ltda.	9,791	9	49%
BS1 Mineração Ltda.	10,200	0	51%
<b>Total</b>	19,991	9	100%

- f) Águia Fertilizantes' bylaws establish that the Company's registered and issued shares shall be fully paid in until December 31, 2018. According to the information provided by the Águia Fertilizantes' representatives, the paid in amount comprises R\$1,030.00 (one thousand and thirty Brazilian reais) which were paid in by BS1 Mineração Ltda.
- g) As informed by the Company's representatives, Águia Fertilizantes' officers are (i) Mr. Fernando Henrique Bucco Tallarico, Brazilian citizen, married, geologist, enrolled before the Brazilian Taxpayer Office under #339.720.441-00 and before the Regional Council of Engineer and Agronomy of Distrito Federal (CREA-DF) under #8017-D, domiciled in the Municipality of Nova Lima, State of Minas Gerais, at Alameda do Universo, #1875, Condomínio Ville de Montagne, Zip Code 34.004-870, and (ii) Helio Botelho Diniz, Brazilian citizen, widower, geologist, enrolled before the Brazilian Taxpayer Office under #297.315.266-68 and before the Regional Council of Engineer and Agronomy of Minas Gerais (CREA-MG) under #26.345-D, domiciled in the Municipality of Belo Horizonte, State of Minas Gerais, at Elza Brandão Rodarte street, #11, apartment 1500, Belvedere, Zip Code 30.320-630, who may, until March 10, 2020, represent the Company before third parties.
- h) On August 13<sup>th</sup>, 2012, Águia Rio Grande Mineração Ltda. ("Águia Rio Grande") entered into a Shareholders Agreement with Mr. Mauro Pinheiro Alves Felipe Barros ("Mauro Barros") and Mrs. Marina Fagundes Carvalho ("Marina Carvalho") (former shareholders of the Company). On April 27<sup>th</sup>, 2017, Águia Rio Grande, Marina Carvalho and Mauro Barros executed the First Amendment to the Shareholders Agreement under which BS1 Mineração Ltda. is included as party at the position of Mr. Barros and Mrs. Carvalho, succeeding the former shareholders on their rights and obligations, with the maintenance of the main terms and conditions of the Shareholders Agreement executed on August 13<sup>th</sup>, 2012, pursuant to the transfer of shares that occurred on July 24, 2014 and June 30, 2016. Noteworthy that, as per item 5 of the First Amendment to the Shareholders Agreement, the parties deliberate that such amendment shall related back to June 30<sup>th</sup>, 2016, thus producing effects from that date on (as it was signed on such date).

Among the rights and obligations set forth under the scope of the Shareholders Agreement, it is important to highlight the following aspects:

- *Voting rights and control.* The Shareholders Agreement sets forth, on its section 5, that each issued and outstanding common share shall be entitled to 1 (one) vote at the general meetings of the shareholders (*Assembleias Gerais*) of the Company, in which, unless the Constitution provides otherwise, each decision shall be passed by votes representing more than 50% (fifty percent) by number of the shares with voting rights issued by the Company. Such provision is also established in the Company's bylaws (article 11).

Considering that BS1 Mineração Ltda. is entitled to 51% (fifty-one percent) of the corporate capital of Águia Fertilizantes, the control of the Company is exercised by BS1 Mineração Ltda. which is a Brazilian company with no foreign participation (direct or indirect)<sup>24</sup>. Furthermore, the bylaws of Águia Fertilizantes stipulate that at least 51% (fifty-one percent) of the Company shares shall always be entitled to Brazilians (article 5, fifth paragraph).

In addition, the Shareholders Agreement also sets forth, in section 7, that neither of the Brazilian shareholders (currently BS1 Mineração Ltda.) shall transfer, either directly or indirectly, any portion or all of its shares, or any portion or all of its rights and obligations, and no such transfer shall be effective, unless such transfer is first consented to in writing by Águia Rio Grande Mineração Ltda. Thus, any purported transfer of shares in violation of such provisions made by the Brazilian shareholders (currently BS1 Mineração Ltda.) shall be null and void, and the Company shall not recognize such transfer for any purpose and shall not reflect in its records any change in record ownership of shares pursuant to any such transfer.

- *Call Option.* As per section 6 of the Shareholders Agreement, the Brazilian shareholders (currently BS1 Mineração Ltda.) granted to Águia Rio Grande Mineração Ltda. the right to require that BS1 Mineração Ltda. sell any portion or all of this shares to Águia Rio Grande Mineração Ltda. or to any party whom Águia Rio Grande designates (the "Call Option"), provided that: (i) Águia Rio Grande complies with the law requirements regarding mineral rights located within the Brazilian border zone and (ii) the shares subject to the Call Option are sold to a Brazilian individual, company or other entity that at the time of the sale satisfies Brazilian Federal Law #6,634/1979 or any amendment or successor law. Águia Rio Grande may exercise the Call Option until August 13<sup>th</sup>, 2032 (twentieth anniversary of the date of execution of the Shareholders Agreement).
- *Preferred Shares.* As prescribed in the Company's bylaws, the preferred shares shall not have voting rights except in the circumstances provided for in the Brazilian Corporate Law, and shall have the following rights: (i) priority in the profit distribution in the minimum amount equivalent to, each one, 10% (ten percent) of the net profits of the Company, which shall be cumulative; (ii) priority in the reimbursement of capital without an award, and (iii) right to receive dividends in the

---

<sup>24</sup>Pursuant to a *Simplified Certificate* issued by the Registry of Companies of the State of Minas Gerais on March 20, 2017, it is possible to identify the following information: (i) BS1 Mineração Ltda. is a limited liability company registered before the Registry of Companies of the State of Minas Gerais under #3120952688-8 and before the Brazilian Federal Revenue Office under #15.557.634/0001-17; (ii) the registered corporate capital of BS1 Mineração Ltda. is R\$1,000.00 (one thousand Brazilian Reais), represented by 1,000 (one thousand) quotas, with the per value of R\$1.00 (one Brazilian real) each; (iii) the quotaholders of BS1 Mineração Ltda. are the Brazilian citizens Fernando Henrique Bucco Tallarico (entitled to 1 quota) and Helio Botelho Diniz (entitled to 999 quotas); (iv) the company is headquartered in Belo Horizonte, Minas Gerais, at Antônio de Albuquerque Street, 156, room 1506, Savassi, Zip Code #30.112-010.

account of capital reserve when the Company's profit is not enough to pay it.

The Shareholders Agreement shall remain valid and binding until August 13<sup>th</sup>, 2032 (twentieth anniversary of the date of execution of the Shareholders Agreement).

- i) Based on the corporate documents of Águia Fertilizantes and as informed by the Company's representatives<sup>25</sup>, Águia Fertilizantes is in compliance with all the requirements stipulated in Brazilian Federal Law #6,634/1979 for the ownership of mineral rights located within Brazilian border areas and, thus, for the performance of mining activities within the Brazilian border areas.
- j) NDC granted, on June 6, 2016, its consent for the transfer of the mineral rights #810.996/2010 and 810.325/2012 from CBC to Águia Fertilizantes. With regards to mineral rights #810.090/1991 and 810.988/2011, which transfer requests in favor of Águia Fertilizantes are currently under DNPM analysis, NDC has not granted its consent yet.
- k) As per certificates made available by the Company, (i) there are no civil lawsuits in the name of Águia Fertilizantes before the State Court of Minas Gerais and before the Federal Court of the 1<sup>st</sup> Region (certificates issued on April 13, 2017); (ii) there are no debts in the name of Águia Fertilizantes before the Treasury Offices at Federal, State (Minas Gerais) and Municipal (Belo Horizonte) levels (certificates issued on April 13, 2017); (iii) the Company is in good standing before the Unemployment Fund registry "FGTS" (certificate issued on April 13, 2017); (iv) the Company has no debts before the Superior Labor Court (certificate issued on April 13, 2017). Nevertheless, it is important to highlight that such certificates are not sufficient to attest full compliance of the Company before all Brazilian public authorities.

### **1.3 INTERMEDIATE COMPANIES**

#### **1.3.1 ÁGUIA RIO GRANDE MINERAÇÃO LTDA.**

1.3.1.1 As to the corporate standing of Águia Rio Grande, based on our analysis of the corporate documents and additional information provided by the Company representatives, to the extent of our knowledge, we understand that:

- a) Águia Rio Grande is a limited liability company organized and existing under the laws of Brazil, in the State of Minas Gerais, with its articles of association duly registered at the Registry of Companies of the State of Minas Gerais on May 23<sup>rd</sup>, 2012 and with the First Amendment to its articles of association duly registered at the Registry of Companies of the State of Minas Gerais on April 2<sup>nd</sup>, 2016.
- b) Águia Rio Grande was incorporated on May 9<sup>th</sup>, 2012 and is registered before the Registry of Companies of the State of Minas Gerais under #312.095.3082-6 and before the Brazilian Federal Revenue Office under #15.584.804/0001-52. The Company is also registered before the Municipality of Belo Horizonte under #0451.492/001-X. As per information obtained through public

---

<sup>25</sup>Moreover, article 24 of Águia Fertilizantes bylaws provides that at least 2/3 of the employees shall always be Brazilian citizens, although we did not examine the employees' documentation under the scope of this opinion.

consultation on the online system of the Treasury Office of the State of Minas Gerais, Águia Rio Grande is not registered before the State of Minas Gerais<sup>26</sup>.

- c) The Company is headquartered in the State of Minas Gerais, Municipality of Belo Horizonte, at Antônio de Albuquerque Street, 156, room 1507, Funcionários, Zip Code 30.112-010 and has no branches.
- d) The registered corporate capital of Águia Rio Grande is R\$3,000,000.00 (three million Brazilian Reais), represented by 3,000,000 (three million) quotas, with par value of R\$1,00 (one Brazilian real) each. Águia Rio Grande's articles of association establish that the company's registered and issued quotas shall be fully paid in until December 31, 2017. According to information provided by the company's representatives, the paid in amount comprises R\$1,030.00 (one thousand and thirty Brazilian reais) which were paid in by BS1 Mineração Ltda.
- e) The current shareholders holding all of the registered and issued capital of Águia Rio Grande are:
  - (i) Águia Metais Ltda., a Brazilian limited liability company with headquarters located at Antônio de Albuquerque Street, 156, room 1504, Funcionários, Zip Code #30.112-010, Belo Horizonte, Minas Gerais, registered before the Brazilian Federal Revenue Office under #10.243.922/0001-83, with 2,999,999 (two million nine hundred ninety-nine thousand nine hundred ninety-nine) quotas and
  - (ii) Mr. Fernando Henrique Bucco Tallarico, Brazilian citizen, married, geologist, enrolled before the Brazilian Taxpayer Office under #339.720.441-00 and before the Regional Council of Engineer and Agronomy of Distrito Federal (CREA-DF) under #8017-D, domiciled in the Municipality of Nova Lima, State of Minas Gerais, at Alameda do Universo, #1875, Condomínio Ville de Montagne, Zip Code 34.000-000, with 1 (one) quota, as indicated in the chart below.

Quotaholder	Fernando Henrique Bucco Tallarico	Águia Metais	Total
<b>Quotas</b>	1	2,999,999	3,000,000

- f) Águia Rio Grande' officer is Mr. Fernando Henrique Bucco Tallarico, Brazilian citizen, married, geologist, enrolled before the Brazilian Taxpayer Office under #339.720.441-00 and before the Regional Council of Engineer and Agronomy of Distrito Federal (CREA-DF) under #8017-D, domiciled in the Municipality of Nova Lima, State of Minas Gerais, at Alameda do Universo, #1875, Condomínio Ville de Montagne, Zip Code 34.004-870, who may represent the Company before third parties.
- g) As informed by the company's representatives, the quotaholders have not entered into any quotaholders agreement up to the date hereof.
- h) As per certificates made available by the Company representatives, (i) there are no civil lawsuits in the name of Águia Rio Grande before the State Court of Minas Gerais and before the Federal Court

<sup>26</sup> The register of the company before the State of Minas Gerais is an ancillary tax obligation. The absence of registration may subject the company to the payment of fines (R\$1.625,70).

of the 1<sup>st</sup> Region (certificates issued on April 13, 2017); (ii) there are no debts in the name of Águia Rio Grande before the Treasury Offices at Federal (certificate issued at March 24, 2017), State (Minas Gerais) and Municipal (Belo Horizonte) levels (certificates issued on April 13, 2017); (iii) Águia Rio Grande is in good standing before the Unemployment Fund registry “FGTS” (certificate issued on April 13, 2017); (iv) the Company has no debts before the Superior Labor Court (certificate issued on April 13, 2017). Nevertheless, it is important to highlight that such certificates are not sufficient to attest full compliance of the Águia Rio Grande before all Brazilian public authorities.

### 1.3.2 ÁGUIA METAIS LTDA.

**1.3.2.1** As to the corporate standing of Águia Metais, based on our analysis of the corporate documents and additional information provided by the Company representatives, to the extent of our knowledge, we understand that:

- a) Águia Metais is a limited liability company organized and existing under the laws of Brazil, in the State of Minas Gerais, with its articles of association duly registered at the Registry of Companies of the State of Minas Gerais on August 6, 2008 and with the Seventeenth Amendment to its articles of association being registered at the Registry of Companies of the State of Minas Gerais<sup>27</sup>.
- b) Águia Metais was incorporated on July 29, 2008 and is registered before the Registry of Companies of the State of Minas Gerais under #312.082.1056-9 and before the Brazilian Federal Revenue Office under #10.243.922/0001-83. The Company is also registered before the Municipality of Belo Horizonte under #0228.344/001-1 and before the State of Minas Gerais under #001083598.00-22.
- c) The Company is headquartered in the State of Minas Gerais, Municipality of Belo Horizonte, at Antônio de Albuquerque Street, 156, room 1504, Funcionários, Zip Code 30.112-010 and has 1 (one) branch located in the State of Rio Grande do Sul, Municipality of Lavras do Sul, at Coronel Galvão Avenue, 276, Centro, Zip Code #97.390-000. The company’s branch is registered before the Brazilian Federal Revenue Office under #10.243.922/0002-64.
- d) The registered corporate capital of Águia Metais is R\$65,000,000.00 (sixty-five million Brazilian Reais), represented by 65,000,000 (sixty-five million) quotas, with par value of R\$1,00 (one Brazilian real) each. Águia Metais’ articles of association establish that the company’s registered and issued quotas shall be fully paid in until December 31, 2018. According to the Sixteenth Amendment to the articles of association of Águia Metais, the capital paid in amount comprises R\$57,571,840.00 (fifty-seven million five hundred seventy-one thousand eight hundred forty Brazilian reais).
- e) The current quotaholders holding all of the registered and issued capital of Águia Metais are: (i) Aguia Phosphate PTY Ltd., an Australian company with headquarters located in Perth, Australia, at Level 9, 28, The Esplanade, #6000, registered before the Brazilian Federal Revenue Office under #12.042.246/0001-05, with 61,999,999 (fifty-one million nine hundred ninety-nine thousand nine hundred ninety-nine) quotas; (ii) Forbes Empreendimentos Mineraiis Ltda., a Brazilian limited liability company, with headquarters located in the State of Minas Gerais, Municipality of Belo

<sup>27</sup>The request for the register of the Seventeenth Amendment to Águia Metais’ articles of association was submitted to the Registry of Companies of the State of Minas Gerais on September 22<sup>nd</sup>, 2017.

Horizonte, at Antônio de Albuquerque Street, 156, room 1507, Funcionários, Zip Code #30.112-010, registered before the Brazilian Federal Revenue Office under #09.167.452/0001-37, with 1 (one) quota, and **(iii)** Potássio do Atlântico Ltda., a Brazilian limited liability company with headquarters located in the State of Minas Gerais, Municipality of Belo Horizonte, at Antônio de Albuquerque Street, 156, room 1502, Funcionários, Zip Code #30.112-010, registered before the Brazilian Federal Revenue Office under #11.285.254/0001-10, with 3,000,000 (three million) quotas, as indicated in the chart below.

Quotaholder	Águia Phosphate PTY Ltd.	Forbes Empreendimentos Minerais Ltda.	Potássio do Atlântico Ltda.	Total
<b>Quotas</b>	61,999,999	1	3,000,000	65,000,000

- f) Águia Metais' officers are **(i)** Mr. Fernando Henrique Bucco Tallarico, Brazilian citizen, married, geologist, enrolled before the Brazilian Taxpayer Office under #339.720.441-00 and before the Regional Council of Engineer and Agronomy of Distrito Federal (CREA-DF) under #8017-D, domiciled in the Municipality of Nova Lima, State of Minas Gerais, at Alameda do Universo, #1875, Condomínio Ville de Montagne, Zip Code 34.004-870, and **(ii)** Helio Botelho Diniz, Brazilian citizen, widower, geologist, enrolled before the Brazilian Taxpayer Office under #297.315.266-68 and before the Regional Council of Engineer and Agronomy of Minas Gerais (CREA-MG) under #26.345-D, domiciled in the Municipality of Belo Horizonte, State of Minas Gerais, at Elza Brandão Rodarte street, #11, apartment 1500, Belvedere, Zip Code 30.320-630, who may represent the Company before third parties.
- g) As informed by the company's representatives, the quotaholders have not entered into any quotaholders agreement up to the date hereof.
- h) As per certificates made available by the Company, (i) there are no civil lawsuits in the name of Águia Metais before the State Court of Minas Gerais and before the Federal Court of the 1<sup>st</sup> Region (certificates issued on April 13, 2017); (ii) there are no debts in the name of Águia Metais before the Treasury Offices at Federal (certificate issued on January 16, 2017), State (Minas Gerais) and Municipal (Belo Horizonte) levels (certificates issued on April 13, 2017); (iii) Águia Metais is in good standing before the Unemployment Fund registry "FGTS" (certificate issued on April 13, 2017); (iv) Águia Metais has no debts before the Superior Labor Court (certificate issued on April 13, 2017). Nevertheless, it is important to highlight that such certificates are not sufficient to attest full compliance of Águia Metais before Brazilian public authorities.

### 1.3.3 POTÁSSIO DO ATLÂNTICO LTDA.

- 1.3.3.1** As to the corporate standing of Potássio do Atlântico, based on our analysis of the corporate documents and additional information provided by the Company representatives, to the extent of our knowledge, we understand that:

- a) Potássio do Atlântico is a limited liability company organized and existing under the laws of Brazil, in the State of Minas Gerais, with its articles of association duly registered at the Registry of Companies of the State of Minas Gerais on November 4, 2009 and with the Sixth Amendment to its articles of association being registered at the Registry of Companies of the State of Minas Gerais<sup>28</sup>.
- b) Potássio do Atlântico is registered before the Registry of Companies of the State of Minas Gerais under #312.086.2780-0 and before the Brazilian Federal Revenue Office under #11.285.254/0001-10. Potássio do Atlântico is registered before the Municipality of Belo Horizonte under #02488270010. As per information obtained through consultation on the online system of the Treasury Office of the State of Minas Gerais, Potássio do Atlântico is not registered before the State of Minas Gerais. Pursuant to the Company's representatives, Potássio do Atlântico has no branches<sup>29</sup>.
- c) The company is headquartered in the State of Minas Gerais, Municipality of Belo Horizonte, at Antônio de Albuquerque Street, 156, room 1502, Funcionários, Zip Code 30.112-010.
- d) The registered corporate capital of Potássio do Atlântico is R\$22,613,929.00 (twenty-two million, six hundred and thirteen thousand, nine hundred twenty-nine Brazilian Reais), represented by 22,613,929 (twenty-two million, six hundred and thirteen thousand, nine hundred twenty-nine ) quotas, with par value of R\$1,00 (one Brazilian real) each. Pursuant to Potássio do Atlântico's articles of association, the total capital has been already paid in.
- e) The current quotaholders holding all of the registered and issued capital of Potássio do Atlântico are: **(i)** Aguia Potash PTY Ltd., an Australian company with headquarters located in New South Wales, Sidney, Australia, at Suite 4. Level 9, 341 George Street, NSW 2000, registered before the Brazilian Federal Revenue Office under #14.052.345/0001-01 with 22,613,928 (twenty-two million, six hundred and thirteen thousand, nine hundred twenty-eight) quotas; and **(ii)** Forbes Empreendimentos Mineraiis Ltda., a Brazilian limited liability company, with headquarters located in the State of Minas Gerais, Municipality of Belo Horizonte, at Antônio de Albuquerque Street, 156, room 1507, Funcionários, Zip Code #30.112-010, registered before the Brazilian Federal Revenue Office under #09.167.452/0001-37, with 1 (one) quota, as indicated in the chart below.

Quotaholder	Aguia Potash PTY Ltd.	Forbes Empreendimentos Mineraiis Ltda.	Total
<b>Quotas</b>	22,613,928	1	22,613,929

- f) Potássio do Atlântico's officer is Mr. Fernando Henrique Bucco Tallarico, Brazilian citizen, married, geologist, enrolled before the Brazilian Taxpayer Office under #339.720.441-00 and before the Regional Council of Engineer and Agronomy of Distrito Federal (CREA-DF) under #8017-D, domiciled in the Municipality of Nova Lima, State of Minas Gerais, at Alameda do Universo, #1875,

<sup>28</sup> The request for the register of the Sixth Amendment to Potássio do Atlântico's articles of association was submitted to the Registry of Companies of the State of Minas Gerais on October 10<sup>th</sup>, 2017.

<sup>29</sup> The register of the company before the State of Minas Gerais is an ancillary tax obligation. The absence of registration may subject the company to the payment of fines (R\$1.625,70).

Condomínio Ville de Montagne, Zip Code 34.004-870, who may represent the company before third parties.

- g)** As informed by the company's representatives, the quotaholders have not entered into any quotaholders agreement up to the date hereof.
- h)** As per certificates made available by the Company, (i) there are no civil lawsuits in the name of Potássio do Atlântico before the State Court of Minas Gerais and before the Federal Court of the 1<sup>st</sup> Region (certificates issued on April 13, 2017); (ii) there are no debts in the name of Potássio do Atlântico before the Treasury Offices at Federal, State (Minas Gerais) and Municipal (Belo Horizonte) levels (certificates issued on April 13, 2017); (iii) Potássio do Atlântico is in good standing before the Unemployment Fund registry "FGTS" (certificate issued on April 13, 2017); (iv) Potássio do Atlântico has no debts before the Superior Labor Court (certificate issued on April 13, 2017). Nevertheless, it is important to highlight that such certificates are not sufficient to attest full compliance of Potássio do Atlântico before all Brazilian public authorities.

**EXHIBIT D**  
**Payments in favor of surface owners**

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
<b>Adão Eli Machado Camargo</b>	R\$ 1,000.00	November 18, 2011	810.090/1991 and 810.325/2012	-
	R\$ 460.00	May 25, 2012	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	August 15, 2012	810.090/1991 and 810.325/2012	-
	R\$ 6,500.00	September 13, 2012	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	December 7, 2012	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	January 29, 2013	810.090/1991 and 810.325/2012	-
	R\$ 1,140.00	October 3, 2013	810.090/1991 and 810.325/2012	-
	R\$ 2,000.00	January 12, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 1,000.00	February 5, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	September 9, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	October 7, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
R\$ 1,000.00	November 5, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.	

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
	R\$ 2,050.00	December 4, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares and the execution of 3 (three) boreholes.
	R\$ 500.00	February 12, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares and the execution of 3 (three) boreholes.
	R\$ 500.00	March 7, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares and the execution of 3 (three) boreholes.
	R\$ 500.00	April 8, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares
	R\$ 500.00	May 11, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	June 9, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	June 20, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	August 5, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares
	R\$ 500.00	August 31, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	October 4, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	November 4, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 1,000.00	December 1, 2016	810.090/1991 and 810.325/2012	-

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
	R\$ 3,000.00	January 6, 2017	810.090/1991 and 810.325/2012	Payment regarding the execution of 5 (five) boreholes.
	R\$ 1,000.00	February 2, 2017	810.090/1991 and 810.325/2012	-
	R\$ 1,020.00	June 4, 2017	Not available	Payment regarding the rent of an area and execution of 1 (one) Archaeological research spot.
	R\$ 1,000.00	June 30, 2017	810.090/1991 and 810.325/2012	Payment regarding the rent of an area.
	R\$ 1,000.00	July 31, 2017	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	September 1, 2017	810.090/1991 and 810.325/2012	-
<b>Carlos Claudino Camargo de Machado</b>	R\$ 920.00	April 19, 2012	810.090/1991 and 810.325/2012	-
<b>Carlos Fagundes</b>	R\$ 206.39	July 18, 2016	810.090/1991 and 810.325/2012	Payment regarding eletricity expenses.
<b>Cláudio Trindade Machado</b>	R\$ 2,000.00	September 13, 2012	810.325/2012	-
	R\$ 2,000.00	November 14, 2012	810.325/2012	-
	R\$ 2,000.00	December 6, 2012	810.325/2012	-
	R\$ 2,000.00	January 22, 2013	810.325/2012	-
	R\$ 1,460.00	June 3, 2013	810.090/1991 and 810.325/2012	-

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
	R\$ 2,500.00	December 5, 2014	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 6,750.00	January 9, 2015	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 4,250.00	February 6, 2015	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 500.00	September 9, 2015	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 500.00	October 7, 2015	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 500.00	November 5, 2015	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 4,250.00	December 2, 2015	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares and the execution of 5 (five) boreholes.
	R\$ 500.00	January 11, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 500.00	February 12, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares and the execution of 5 (five) boreholes.
	R\$ 500.00	March 7, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares and the execution of 5 (five) boreholes.
	R\$ 500.00	April 8, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 500.00	May 11, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 500.00	June 9, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
	R\$ 500.00	June 20, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 500.00	August 5, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 500.00	August 31, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 500.00	October 4, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 500.00	November 4, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 500.00	November 7, 2016	810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares.
	R\$ 1,000.00	December 1, 2016	810.325/2012	-
	R\$ 1,000.00	December 1, 2016	810.325/2012	-
	R\$ 4,000.00	January 6, 2017	810.325/2012	Payment regarding the execution of 5 (five) boreholes.
	R\$ 5,200.00	February 2, 2017	810.325/2012	Payment regarding the execution of 6 (six) boreholes.
	R\$ 2,320.00	June 5, 2017	810.090/1991 and 810.325/2012	Payment regarding the rent of an area and 16 (sixteen) Archaeological research spots.
	R\$ 2,000.00	June 30, 2017	810.090/1991 and 810.325/2012	Payment regarding the rent of an area.
	R\$ 2,000.00	July 31, 2017	810.090/1991 and 810.325/2012	-

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
	R\$ 2,000.00	September 1, 2017	810.325/2012	-
<b>Colotilde Gularte Machado</b>	R\$ 860.00	September 2, 2013	810.090/1991 and 810.325/2012	-
	R\$ 1,250.00	December 5, 2014	810.325/2012	Payment regarding the rent of an area.
	R\$ 2,500.00	January 12, 2015	810.325/2012	Payment regarding the rent of an area.
	R\$ 1,000.00	February 9, 2015	810.325/2012	Payment regarding the rent of an area.
	R\$ 3,000.00	March 13, 2017	810.325/2012	Payment regarding the rent of property and the execution of 5 (five) boreholes.
	R\$ 350.00	September 1, 2017	Not available	-
<b>Eli Machado Camargo</b>	R\$ 1,060.00	November 29, 2012	810.090/1991 and 810.325/2012	-
	R\$ 500.00	January 11, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
<b>Enio Lopes Marques</b>	R\$ 1,200.00	September 1, 2016	810.325/2012	Payment regarding the execution of an auger hole.
<b>Eronides Trindade</b>	R\$ 730.00	June 2, 2017	Not available	Payment regarding the rent of an area and the execution of 1 (one) borehole.
<b>Fabício Marques</b>	R\$ 189.00	July 18, 2016	810.090/1991 and 810.325/2012	Payment regarding eletricity expenses.

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
<b>Gualter Nunes Azambuja</b>	R\$ 1,000.00	September 17, 2012	810.090/1991 and 810.325/2012	-
	R\$ 1,020.00	November 21, 2012	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	December 20, 2012	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	January 23, 2013	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	February 4, 2013	810.090/1991 and 810.325/2012	-
	R\$ 1,250.00	December 5, 2014	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 10 (ten) hectares.
<b>Jacy Coelho Caminha</b>	R\$ 1,080.00	June 5, 2017	Not available	Payment regarding the rent of an area and execution of Archaeological research spots.
<b>Jerônimo Machado Neto</b>	R\$ 1,000.00	December 5, 2014	810.090/1991 and 810.325/2012	Payment regarding the rent of an area.
	R\$ 1,500.00	January 12, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area.
	R\$ 1,000.00	February 5, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area.
	R\$ 3,000.00	February 8, 2017	810.090/1991 and 810.325/2012	-

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
<b>Jesus Fabrício Machado Jardim</b>	R\$ 250.00	November 18, 2011	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	August 17, 2012	810.090/1991 and 810.325/2012	-
<b>João Laerte Soares de Freitas</b>	R\$ 1,580.00	June 4, 2017	Not available	Payment regarding the rent of an area and execution of 29 (twenty-nine) Archaeological research spots.
<b>José Adail Freitas Soares</b>	R\$ 1,040.00	June 2, 2017	Not available	Payment regarding the rent of an area and execution of Archaeological research spots.
<b>José Cleider Machado Oliveira</b>	R\$ 1,100.00	June 30, 2017	810.325/2012 and 810.090/1991	Payment regarding the rent of an area and execution of 5 (five) Archaeological research holes.
<b>Lair Camera</b>	R\$ 2,720.00	June 6, 2017	Not available	Payment regarding the rent of an area and execution of 86 (eighty-six) Archaeological research spots.
<b>Leonardo Krieger Remedi</b>	R\$ 2,000.00	December 5, 2014	810.325/2012	Payment regarding the rent of an area.
	R\$ 3,750.00	January 9, 2015	810.325/2012	Payment regarding the rent of an area.
	R\$ 1,000.00	February 10, 2015	810.325/2012	Payment regarding the rent of an area.
	R\$ 2,050.00	December 9, 2015	810.325/2012	Payment regarding the rent of an area and the execution of 3 (three) boreholes.
	R\$ 7,800.00	December 1, 2016	810.325/2012	-
<b>Leonardo Nocchi Macedo</b>	R\$ 2,140.00	March 7, 2017	810.325/2012	Payment regarding the execution of 2 (two) boreholes and 17 (seventeen) auger holes.
<b>Marcia Machado Goulart</b>	R\$ 1,580.00	June 5, 2017	Not available	Payment regarding the rent of an area and execution of 29 (twenty-nine)

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
				Archaeological research spots.
<b>Milton de Almeida Azambuja</b>	R\$ 2,250.00	January 12, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 10 (ten) hectares.
	R\$ 1,500.00	February 10, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 10 (ten) hectares.
	R\$ 1,800.00	December 2, 2016	810.090/1991 and 810.325/2012	-
	R\$ 2,600.00	January 6, 2017	810.090/1991 and 810.325/2012	-
	R\$ 7,000.00	February 6, 2017	810.090/1991 and 810.325/2012	-
	R\$ 1,080.00	June 5, 2017	Not available	Payment regarding the rent of an area and execution of Archaeological research spots.
	R\$ 1,800.00	June 30, 2017	810.090/1991 and 810.325/2012	Payment regarding the rent of an area and the execution of 2 (two) boreholes.
	R\$ 350.00	July 31, 2017	810.090/1991 and 810.325/2012	Payment regarding the rent of an area.
<b>Milton de Almeida Machado</b>	R\$ 3,800.00	March 20, 2017	810.090/1991 and 810.325/2012	Payment regarding the rent of real estate and the execution of an auger hole.
<b>Neri Machado Camargo</b>	R\$ 2,035.15	October 20, 2011	810.090/1991 and 810.325/2012	-
	R\$ 2,000.00	October 20, 2011	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	November 18, 2011	810.090/1991 and 810.325/2012	-

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
	R\$ 1,750.00	August 15, 2012	810.090/1991 and 810.325/2012	-
	R\$ 5,000.00	September 14, 2012	810.090/1991 and 810.325/2012	-
	R\$ 1,060.00	November 8, 2012	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	December 7, 2012	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	January 23, 2013	810.090/1991 and 810.325/2012	-
	R\$ 1,500.00	December 5, 2014	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 2,550.00	January 8, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 2,200.00	February 5, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	October 7, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 1,000.00	November 5, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 3,100.00	December 2, 2015	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares and the execution of 6 (six) boreholes.
	R\$ 500.00	January 11, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	February 12, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares and the execution of 6 (six) boreholes.

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
	R\$ 500.00	March 7, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 63 (sixty-three) hectares and the execution of 6 (six) boreholes.
	R\$ 500.00	April 8, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	May 11, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	June 9, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	June 20, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	August 5, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	August 31, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	October 4, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 500.00	November 4, 2016	810.090/1991 and 810.325/2012	Payment regarding the rent of an area of 100 (one hundred) hectares.
	R\$ 4,200.00	December 1, 2016	810.090/1991 and 810.325/2012	-
	R\$ 12,200.00	January 4, 2017	810.090/1991 and 810.325/2012	Payment regarding the execution of 28 (twenty-eight) boreholes.
	R\$ 3,400.00	February 2, 2017	810.090/1991 and 810.325/2012	Payment regarding the execution of 6 (six) boreholes.

Surface Owner	Payment	Date (Agreement / Authorization)	Mineral Right DNPM #	Note
	R\$ 1,400.00	March 2, 2017	810.090/1991 and 810.325/2012	Payment regarding the execution of 1 (one) borehole.
	R\$ 3,500.00	June 6, 2017	810.090/1991 and 810.325/2012	Payment regarding the rent of an area, the execution of 3 (three) geotechnical boreholes, 63 (sixth three) archaeological research spots and 2 (two) geological research auger holes.
	R\$ 1,200.00	June 30, 2017	810.090/1991 and 810.325/2012	Payment regarding the rent of an area and the execution of 3 (three) boreholes.
	R\$ 1,000.00	July 31, 2017	810.090/1991 and 810.325/2012	-
	R\$ 1,000.00	September 1, 2017	810.090/1991 and 810.325/2012	-
<b>Vainer Silva Parodes and Iloenes Maria Parodes de Parodes</b>	R\$ 1,900.00	June 3, 2017	Not available	Payment regarding the rent of an area and execution of 45 (forty-five) Archaeological research spots.

**29 APPENDIX B: DRILL HOLE DATABASE**

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TED-11-001	Core	767,854.52	6,577,465.33	351.15	41.55	150.00	(60.00)	9/13/2011	44
TED-11-002	Core	767,865.60	6,577,445.76	353.62	40.85	150.00	(60.00)	9/15/2011	44
TED-11-003	Core	767,706.08	6,577,323.28	358.24	40.65	150.00	(60.00)	9/17/2011	40
TED-11-004	Core	767,549.21	6,577,194.28	366.40	50.75	150.00	(60.00)	9/20/2011	52
TED-11-005	Core	767,408.02	6,577,035.03	356.90	43.25	150.00	(60.00)	9/22/2011	42
TED-11-006	Core	767,381.46	6,577,080.15	351.64	100.60	150.00	(60.00)	9/26/2011	102
TED-11-007	Core	767,525.14	6,577,235.22	362.17	71.95	150.00	(45.00)	9/29/2011	76
TED-11-008	Core	767,561.58	6,577,172.52	366.17	40.85	150.00	(45.00)	9/30/2011	41
TED-11-009	Core	767,498.35	6,577,280.85	356.50	71.10	150.00	(45.00)	10/4/2011	73
TED-11-010	Core	767,682.14	6,577,366.89	353.99	78.20	150.00	(45.00)	10/6/2011	79
TED-11-011	Core	767,657.71	6,577,409.87	350.45	101.05	150.00	(45.00)	10/11/2011	100
TED-11-012	Core	767,628.82	6,577,466.73	342.95	126.10	150.00	(45.00)	10/17/2011	121
TED-11-013	Core	767,832.05	6,577,506.19	348.68	80.75	150.00	(45.00)	10/20/2011	80
TED-11-014	Core	768,110.89	6,577,583.63	328.33	33.40	150.00	(45.00)	10/24/2011	34
TED-11-015	Core	768,085.25	6,577,626.78	334.49	94.40	150.00	(45.00)	10/28/2011	92
TED-11-016	Core	767,127.87	6,577,122.09	356.32	109.70	150.00	(45.00)	11/4/2011	109
TED-11-017	Core	767,084.62	6,577,040.81	350.41	41.10	150.00	(45.00)	11/7/2011	41
TED-11-018	Core	767,298.41	6,577,195.48	341.06	69.70	150.00	(45.00)	11/9/2011	70
TED-11-019	Core	768,128.25	6,577,554.84	325.77	81.20	330.00	(60.00)	11/12/2011	82
TED-12-020	Core	767,105.00	6,577,176.42	351.04	205.55	150.00	(55.00)	7/27/2012	171
TED-12-021	Core	767,052.19	6,577,110.13	347.11	229.50	150.00	(75.00)	8/6/2012	175
TED-12-022	Core	767,229.11	6,577,157.18	352.96	343.00	150.00	(65.00)	8/17/2012	341
TED-12-023	Core	767,632.58	6,577,262.27	361.70	69.65	150.00	(65.00)	8/17/2012	63
TED-12-024	Core	767,452.40	6,577,173.35	361.12	113.75	150.00	(55.00)	8/21/2012	120
TED-12-025	Core	767,605.84	6,577,308.25	357.50	103.70	150.00	(65.00)	8/21/2012	110
TED-12-026	Core	767,511.69	6,577,258.24	359.32	156.00	150.00	(55.00)	8/24/2012	143
TED-12-027	Core	767,558.13	6,577,390.30	345.59	248.65	150.00	(65.00)	8/28/2012	216
TED-12-028	Core	767,474.37	6,577,321.88	355.08	219.80	150.00	(55.00)	9/1/2012	217
TED-12-029	Core	767,407.42	6,577,250.62	352.54	206.15	150.00	(55.00)	9/6/2012	201
TED-12-030	Core	767,364.78	6,577,322.78	353.74	319.10	150.00	(55.00)	9/13/2012	212
TED-12-031	Core	767,651.66	6,577,420.88	349.47	185.20	150.00	(60.00)	9/11/2012	181
TED-12-032	Core	767,929.79	6,577,559.93	335.17	80.10	150.00	(60.00)	9/18/2012	71
TED-12-033	Core	767,760.80	6,577,436.20	352.82	102.80	150.00	(55.00)	9/15/2012	109
TED-12-034	Core	767,803.05	6,577,558.75	344.99	202.65	150.00	(60.00)	9/25/2012	72
TED-12-035	Core	767,898.89	6,577,602.47	346.87	181.85	150.00	(65.00)	9/26/2012	0
TED-12-036	Core	767,353.17	6,577,181.11	345.57	199.75	150.00	(60.00)	9/29/2012	205
TED-12-037	Core	767,725.02	6,577,499.91	348.83	172.20	150.00	(60.00)	10/1/2012	100
TED-12-038	Core	767,307.29	6,577,278.72	349.72	355.75	150.00	(60.00)	10/10/2012	303
TED-12-039	Core	767,895.93	6,577,411.03	344.27	187.60	330.00	(55.00)	10/8/2012	138
TED-12-040	Core	768,002.97	6,577,601.83	329.84	134.00	150.00	(60.00)	10/16/2012	0
TED-14-041	Core	767,329.77	6,576,986.51	359.77	100.00	150.00	(60.00)	11/20/2014	95
TED-14-042	Core	767,250.66	6,576,924.25	363.10	93.60	150.00	(60.00)	11/22/2014	100
TED-14-043	Core	767,103.25	6,576,782.56	367.82	90.80	150.00	(50.00)	11/25/2014	101
TED-14-044	Core	766,935.18	6,576,672.75	362.82	190.10	150.00	(62.00)	11/29/2014	172
TED-14-045	Core	766,779.32	6,576,537.44	358.87	179.30	150.00	(60.00)	12/2/2014	144
TED-14-046	Core	766,642.10	6,576,378.80	353.01	117.80	150.00	(60.00)	12/5/2014	99
TED-14-047	Core	767,327.52	6,577,098.37	352.08	141.00	330.00	(60.00)	12/8/2014	143
TED-14-048	Core	766,960.38	6,577,026.13	344.48	70.25	150.00	(50.00)	12/9/2014	0
TED-14-049	Core	767,200.07	6,577,011.74	362.64	234.00	150.00	(60.00)	12/16/2014	198
TED-14-050	Core	767,123.21	6,576,894.61	365.71	191.25	150.00	(50.00)	12/16/2014	151
TED-14-051	Core	767,244.55	6,577,051.37	361.45	180.60	330.00	(60.00)	1/12/2015	130
TED-14-052	Core	766,985.40	6,576,782.76	363.95	233.45	150.00	(55.00)	1/12/2015	151
TED-15-053	Core	767,019.27	6,576,924.80	355.06	124.00	330.00	(60.00)	1/15/2015	128
TED-15-054	Core	766,422.39	6,576,377.34	330.65	118.65	330.00	(60.00)	1/15/2015	126
TED-15-055	Core	766,878.16	6,576,770.31	362.14	215.55	330.00	(70.00)	1/22/2015	209
TED-15-056	Core	766,348.69	6,576,269.44	329.09	165.55	330.00	(55.00)	1/21/2015	169
TED-15-057	Core	766,439.50	6,576,324.82	335.88	273.00	330.00	(60.00)	1/29/2015	273
TED-15-058	Core	766,706.77	6,576,667.83	346.90	226.50	330.00	(60.00)	1/29/2015	230
TED-15-059	Core	766,292.16	6,576,189.59	321.87	203.50	330.00	(60.00)	2/3/2015	178
TED-15-060	Core	766,569.77	6,576,509.65	344.26	124.00	330.00	(60.00)	2/2/2015	126
TED-15-061	Core	767,649.90	6,577,329.19	355.10	83.45	150.00	(60.00)	10/24/2015	91
TED-15-062	Core	767,566.52	6,577,282.66	359.22	106.00	150.00	(60.00)	10/28/2015	121
TED-15-063	Core	767,454.47	6,577,274.23	356.34	231.15	150.00	(60.00)	11/1/2015	220
TED-15-064	Core	767,703.39	6,577,437.82	352.28	120.15	150.00	(60.00)	11/4/2015	124
TED-15-065	Core	767,461.74	6,576,960.90	359.45	120.45	150.00	(60.00)	11/6/2015	42
TED-15-066	Core	767,880.97	6,577,526.27	340.28	76.00	150.00	(60.00)	11/6/2015	79

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TED-15-067	Core	767,288.65	6,576,952.35	361.92	136.50	150.00	(60.00)	11/11/2015	96
TED-15-068	Core	767,978.41	6,577,582.53	331.72	90.20	150.00	(60.00)	11/11/2015	49
TED-15-069	Core	767,794.50	6,577,485.53	351.06	138.70	150.00	(60.00)	11/16/2015	142
TED-15-070	Core	767,367.27	6,576,919.33	361.28	108.05	150.00	(60.00)	11/14/2015	103
TED-15-071	Core	767,400.60	6,577,164.97	353.34	139.15	150.00	(60.00)	11/19/2015	142
TED-15-072	Core	767,086.18	6,576,807.60	367.30	135.85	150.00	(60.00)	11/20/2015	131
TED-15-073	Core	766,785.27	6,576,826.38	352.24	82.50	150.00	(60.00)	11/21/2015	84
TED-15-074	Core	766,983.05	6,576,687.08	365.07	127.25	150.00	(60.00)	11/23/2015	122
TED-15-075	Core	766,613.76	6,576,633.49	341.99	112.00	150.00	(60.00)	11/23/2015	84
TED-15-076	Core	766,854.19	6,576,617.26	358.93	185.40	150.00	(60.00)	11/28/2015	134
TED-15-077	Core	766,457.10	6,576,510.15	331.55	101.70	150.00	(60.00)	11/26/2015	105
TED-15-078	Core	766,759.28	6,576,480.16	357.73	100.15	150.00	(60.00)	12/2/2015	99
TED-16-079	Core	767657.893	6577315.130	350.712	65.30	0.00	-90.00	15/11/2016	65
TED-16-080	Core	767541.447	6577316.804	347.730	55.00	0.00	-90.00	09/11/2016	60
TED-16-081	Core	767404.995	6577059.084	349.443	56.25	0.00	-90.00	09/11/2016	57
TED-16-082	Core	767243.180	6577135.614	348.065	55.00	0.00	-90.00	14/11/2016	58
TED-16-083	Core	767571.454	6577364.373	343.042	65.45	150.00	-65.00	14/11/2016	58
TED-16-084	Core	767204.280	6576803.949	362.775	135.80	0.00	-90.00	15/11/2016	134
TED-16-085	Core	767583.879	6577342.053	345.506	148.80	150.00	-65.00	18/11/2016	146
TED-16-086	Core	767187.694	6576938.661	357.523	176.05	150.00	-55.00	23/11/2016	132
TED-16-087	Core	766993.608	6576964.979	340.836	65.30	330.00	-80.00	19/11/2016	75
TED-16-088	Core	767255.007	6577118.622	348.761	270.80	150.00	-60.00	26/11/2016	174
TED-16-089	Core	767492.500	6577408.657	346.320	297.90	150.00	-55.00	29/11/2016	190
TED-16-090	Core	767063.580	6576843.587	358.355	228.10	150.00	-60.00	30/11/2016	159
TED-16-091	Core	767163.640	6576964.407	356.747	246.20	150.00	-60.00	30/11/2016	154
TED-16-092	Core	767212.858	6577190.875	345.373	170.15	150.00	-65.00	03/12/2016	121
TED-16-093	Core	767423.935	6577290.494	349.210	106.10	150.00	-60.00	02/12/2016	83
TED-16-094	Core	767141.725	6577017.531	353.924	306.90	150.00	-60.00	10/12/2016	235
TED-16-095	Core	767045.507	6576879.986	354.550	292.30	150.00	-60.00	12/12/2016	190
TED-16-096	Core	767421.800	6577319.877	350.753	272.85	150.00	-60.00	08/12/2016	227
TED-16-097	Core	767169.260	6577176.982	348.790	105.90	150.00	-60.00	08/12/2016	67
TED-16-098	Core	767090.112	6577102.141	346.018	117.95	150.00	-70.00	14/12/2016	72
TED-16-099	Core	767374.990	6577124.493	343.586	145.75	150.00	-60.00	13/12/2016	132
TED-16-100	Core	766904.240	6576933.524	346.620	194.15	150.00	-60.00	16/12/2016	199
TED-16-101	Core	767016.889	6577128.671	334.479	267.75	150.00	-50.00	06/01/2017	174
TED-16-102	Core	767292.529	6577146.836	341.284	242.55	150.00	-60.00	18/12/2016	179
TED-16-103	Core	767193.387	6577128.385	350.932	307.50	150.00	-58.00	12/01/2017	207
TED-16-104	Core	767119.792	6577050.813	348.521	319.35	150.00	-60.00	23/01/2017	193
TED-16-105	Core	767279.887	6577067.377	353.138	203.10	150.00	-60.00	10/01/2017	149
TED-17-106	Core	767009.289	6576840.732	355.716	210.80	330.00	-60.00	18/01/2017	163
TED-17-107	Core	767268.059	6576992.881	355.329	145.15	150.00	-60.00	16/01/2017	118
TED-17-108	Core	767000.935	6577050.078	335.599	284.60	150.00	-60.00	28/01/2017	235
TED-17-109	Core	767081.076	6576921.682	355.583	286.05	150.00	-60.00	01/02/2017	166
TED-17-110	Core	766900.810	6576724.654	357.576	255.55	150.00	-60.00	04/02/2017	193
TED-17-111	Core	767293.705	6577243.236	332.101	288.70	150.00	-60.00	02/02/2017	240
TED-17-112	Core	767602.825	6576914.952	347.519	129.90	330.00	-60.00	04/02/2017	93
TED-17-113	Core	766203.617	6576237.834	313.469	50.40	330.00	-55.00	03/02/2017	29
TED-17-114	Core	767302.254	6577189.815	335.346	279.45	150.00	-60.00	09/02/2017	239
TED-17-115	Core	766760.867	6576776.248	345.211	65.25	150.00	-60.00	08/02/2017	69
TED-17-116	Core	767487.266	6576793.673	346.525	166.95	330.00	-60.00	11/02/2017	109
TED-17-117	Core	767258.650	6576616.201	350.692	206.20	330.00	-55.00	20/02/2017	110
TED-17-118	Core	767773.707	6576921.368	333.011	199.20	330.00	-55.00	27/02/2017	92
TED-17-119	Core	767382.726	6576692.498	347.358	188.50	330.00	-55.00	25/02/2017	
TED-17-120	Core	767134.533	6576526.059	356.178	212.90	330.00	-55.00	09/03/2017	
TED-17-121	Core	767719.902	6577008.075	343.657	66.35	330.00	-55.00	01/03/2017	70
TED-17-122	Core	767640.082	6577146.883	345.771	215.50	150.00	-55.00	13/03/2017	
TED-17-123	Core	767227.452	6576664.383	353.946	150.65	330.00	-55.00	19/03/2017	
TED-17-124	Core	767482.015	6576832.467	347.367	105.00	330.00	-55.00	17/03/2017	97
TED-17-125	Core	767529.876	6576841.793	349.249	97.00	330.00	-55.00	22/03/2017	76
TED-17-126	Core	767568.394	6576862.468	349.676	95.40	330.00	-55.00	31/03/2017	91
TED-17-127	Core	767649.367	6576930.198	345.986	107.80	330.00	-55.00	28/03/2017	97
TED-17-128	Core	767322.090	6576804.710	353.753	150.65	0.00	-90.00	27/03/2017	133
TED-17-129	Core	767642.527	6577034.324	346.479	129.75	150.00	-55.00	30/03/2017	25
TED-17-130	Core	767775.215	6577016.652	340.336	88.40	330.00	-55.00	03/04/2017	29
TED-17-131	Core	767392.648	6576764.183	348.386	125.40	330.00	-55.00	07/04/2017	125
TED-17-132	Core	767315.767	6576711.899	350.743	150.95	330.00	-55.00	10/04/2017	108

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TED-17-133	Core	767461.857	6576766.865	348.026	125.60	330.00	-55.00	11/04/2017	67
TED-17-134	Core	767438.782	6576844.681	348.669	27.10	0.00	-90.00	31/05/2017	28
TED-17-135	Core	767484.611	6576867.938	348.736	29.75	0.00	-90.00	01/06/2017	30
TED-17-136	Core	767475.406	6576894.230	350.370	51.75	0.00	-90.00	03/06/2017	54
TED-17-137	Core	767573.464	6576924.450	347.650	39.75	0.00	-90.00	05/06/2017	43
TED-17-138	Core	767630.953	6576963.809	348.855	30.70	330.00	-80.00	06/06/2017	31
TED-17-139	Core	767674.725	6576985.365	347.436	32.70	330.00	-55.00	07/06/2017	35
TER-12-001	RC	768,149.35	6,577,677.02	321.21	13.00	-	(90.00)	9/1/2012	13
TER-12-002	RC	768,154.56	6,577,626.72	325.78	15.00	-	(90.00)	9/3/2012	15
TER-12-003	RC	768,190.41	6,577,596.32	326.04	12.00	-	(90.00)	9/3/2012	12
TER-12-004	RC	768,141.35	6,577,578.50	328.64	15.00	-	(90.00)	9/3/2012	15
TER-12-005	RC	768,105.71	6,577,548.51	323.53	10.00	-	(90.00)	9/3/2012	10
TER-12-006	RC	768,121.48	6,577,616.70	330.07	18.00	-	(90.00)	9/3/2012	18
TER-12-007	RC	768,085.03	6,577,580.14	326.59	15.00	-	(90.00)	9/3/2012	15
TER-12-008	RC	768,054.87	6,577,630.42	336.77	11.00	-	(90.00)	9/4/2012	11
TER-12-009	RC	768,098.45	6,577,656.23	332.32	15.00	-	(90.00)	9/4/2012	15
TER-12-010	RC	767,991.32	6,577,540.39	327.04	13.00	-	(90.00)	9/4/2012	13
TER-12-011	RC	768,014.89	6,577,495.37	325.44	13.00	-	(90.00)	9/5/2012	13
TER-12-012	RC	767,952.71	6,577,510.80	335.83	20.00	-	(90.00)	9/5/2012	20
TER-12-013	RC	767,931.51	6,577,445.14	342.37	21.00	-	(90.00)	9/5/2012	21
TER-12-014	RC	767,954.43	6,577,402.37	335.55	12.00	-	(90.00)	9/5/2012	12
TER-12-015	RC	767,777.12	6,577,412.88	353.28	30.00	-	(90.00)	9/7/2012	30
TER-12-016	RC	767,801.40	6,577,476.71	351.11	27.00	-	(90.00)	9/7/2012	27
TER-12-017	RC	767,819.56	6,577,437.39	353.37	33.00	-	(90.00)	9/7/2012	33
TER-12-018	RC	767,759.19	6,577,342.98	353.82	31.00	-	(90.00)	9/8/2012	31
TER-12-019	RC	767,752.02	6,577,456.54	352.17	18.00	-	(90.00)	9/8/2012	18
TER-12-020	RC	767,898.12	6,577,490.22	344.04	25.00	-	(90.00)	9/10/2012	25
TER-12-021	RC	767,879.67	6,577,529.17	340.55	15.00	-	(90.00)	9/10/2012	15
TER-12-022	RC	767,881.98	6,577,422.85	349.01	14.00	-	(90.00)	9/10/2012	14
TER-12-023	RC	767,801.79	6,577,370.45	352.43	18.00	-	(90.00)	9/10/2012	18
TER-12-024	RC	767,708.10	6,577,429.78	352.26	21.00	-	(90.00)	9/10/2012	21
TER-12-025	RC	767,734.23	6,577,388.37	354.15	26.00	-	(90.00)	9/10/2012	26
TER-12-026	RC	767,622.96	6,577,384.82	347.98	15.00	-	(90.00)	9/10/2012	15
TER-12-027	RC	767,645.34	6,577,348.04	353.12	16.00	-	(90.00)	9/10/2012	16
TER-12-028	RC	767,672.12	6,577,296.90	359.02	30.00	-	(90.00)	9/10/2012	30
TER-12-029	RC	767,584.33	6,577,244.41	362.99	30.00	-	(90.00)	9/11/2012	30
TER-12-030	RC	767,738.89	6,577,276.32	351.23	21.00	-	(90.00)	9/11/2012	21
TER-12-031	RC	767,695.00	6,577,252.29	355.44	30.00	-	(90.00)	9/11/2012	30
TER-12-032	RC	767,650.40	6,577,227.70	359.32	21.00	-	(90.00)	9/11/2012	21
TER-12-033	RC	767,558.84	6,577,286.66	358.41	20.00	-	(90.00)	9/11/2012	20
TER-12-034	RC	767,534.12	6,577,331.17	352.51	21.00	-	(90.00)	9/12/2012	21
TER-12-035	RC	767,472.10	6,577,236.70	358.57	15.00	-	(90.00)	9/12/2012	15
TER-12-036	RC	767,447.05	6,577,279.93	356.10	19.00	-	(90.00)	9/12/2012	19
TER-12-037	RC	767,498.05	6,577,190.56	365.47	26.00	-	(90.00)	9/12/2012	26
TER-12-038	RC	767,518.91	6,577,150.51	366.89	32.00	-	(90.00)	9/12/2012	32
TER-12-039	RC	767,609.54	6,577,200.88	362.27	27.00	-	(90.00)	9/12/2012	27
TER-12-040	RC	767,577.15	6,577,357.03	350.69	15.00	-	(90.00)	9/13/2012	15
TER-12-041	RC	767,429.79	6,577,213.85	355.93	14.00	-	(90.00)	9/13/2012	14
TER-12-042	RC	767,480.69	6,577,126.14	366.49	14.00	-	(90.00)	9/13/2012	14
TER-12-043	RC	767,504.58	6,577,082.70	363.53	25.00	-	(90.00)	9/13/2012	25
TER-12-044	RC	767,412.08	6,577,147.21	355.85	30.00	-	(90.00)	9/14/2012	30
TER-12-045	RC	767,438.29	6,577,102.26	360.67	24.00	-	(90.00)	9/14/2012	24
TER-12-046	RC	767,462.82	6,577,060.00	363.41	28.00	-	(90.00)	9/14/2012	28
TER-12-047	RC	767,487.07	6,577,017.43	358.87	12.00	-	(90.00)	9/14/2012	12
TER-12-048	RC	767,529.36	6,577,040.08	356.75	15.00	-	(90.00)	9/14/2012	15
TER-12-049	RC	767,549.71	6,577,106.49	360.71	15.00	-	(90.00)	9/14/2012	15
TER-12-050	RC	767,683.32	6,577,471.53	350.43	17.00	-	(90.00)	9/14/2012	17
TER-12-051	RC	767,596.29	6,577,427.51	342.13	15.00	-	(90.00)	9/14/2012	15
TER-12-052	RC	767,507.42	6,577,374.06	348.66	21.00	-	(90.00)	9/14/2012	21
TER-12-053	RC	767,420.92	6,577,328.09	357.77	15.00	-	(90.00)	9/14/2012	15
TER-12-054	RC	767,541.27	6,577,222.09	363.92	27.00	-	(90.00)	9/17/2012	27
TER-12-055	RC	767,547.89	6,577,191.41	366.56	30.00	150.00	(60.00)	9/17/2012	30
TER-12-056	RC	767,703.79	6,577,321.44	358.30	30.00	150.00	(60.00)	9/17/2012	30
TER-12-057	RC	767,411.53	6,577,036.26	357.38	30.00	150.00	(60.00)	9/17/2012	30
TER-12-058	RC	767,591.15	6,577,133.78	357.53	15.00	-	(90.00)	9/17/2012	15
TER-12-059	RC	767,362.01	6,577,234.42	346.53	17.00	-	(90.00)	9/18/2012	17

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TER-12-060	RC	767,394.05	6,577,185.55	351.92	12.00	-	(90.00)	9/19/2012	12
TER-12-061	RC	767,369.56	6,577,122.37	349.11	15.00	-	(90.00)	9/19/2012	15
TER-12-062	RC	767,353.96	6,577,057.98	352.46	12.00	-	(90.00)	9/19/2012	12
TER-12-063	RC	767,323.34	6,577,095.78	353.00	10.00	-	(90.00)	9/19/2012	10
TER-12-064	RC	767,296.62	6,577,135.75	349.04	13.00	-	(90.00)	9/19/2012	13
TER-12-065	RC	767,276.01	6,577,185.44	343.50	15.00	-	(90.00)	9/19/2012	15
TER-12-066	RC	767,244.27	6,577,227.31	340.02	11.00	-	(90.00)	9/19/2012	11
TER-12-067	RC	767,332.28	6,577,281.23	349.41	12.00	-	(90.00)	9/19/2012	12
TER-12-068	RC	767,374.23	6,577,009.66	356.24	23.00	-	(90.00)	9/19/2012	23
TER-12-069	RC	767,303.50	6,577,028.62	361.02	19.00	-	(90.00)	9/20/2012	19
TER-12-070	RC	767,281.82	6,577,072.77	359.10	18.00	-	(90.00)	9/20/2012	18
TER-12-071	RC	767,239.89	6,577,045.75	361.77	18.00	-	(90.00)	9/20/2012	18
TER-12-072	RC	767,219.39	6,577,091.50	359.70	17.00	-	(90.00)	9/20/2012	17
TER-12-073	RC	767,168.98	6,577,069.34	360.04	15.00	-	(90.00)	9/20/2012	15
TER-12-074	RC	767,127.76	6,577,037.96	356.88	15.00	-	(90.00)	9/20/2012	15
TER-12-075	RC	767,144.20	6,577,114.38	357.29	24.00	-	(90.00)	9/21/2012	24
TER-12-076	RC	767,162.24	6,577,174.57	355.41	18.00	-	(90.00)	9/21/2012	18
TER-12-077	RC	767,204.27	6,577,200.73	351.25	15.00	-	(90.00)	9/21/2012	15
TER-12-078	RC	767,187.10	6,577,131.09	357.39	21.00	-	(90.00)	9/21/2012	21
TER-12-079	RC	767,122.91	6,577,146.58	355.13	12.00	-	(90.00)	9/21/2012	12
TER-12-080	RC	767,098.21	6,577,092.92	353.42	14.00	-	(90.00)	9/21/2012	14
TER-12-081	RC	767,078.61	6,577,126.71	348.09	12.00	-	(90.00)	9/21/2012	12
TER-12-082	RC	767,034.96	6,577,102.42	343.66	12.00	-	(90.00)	9/21/2012	12
TER-12-083	RC	767,195.04	6,577,018.79	362.35	15.00	-	(90.00)	9/21/2012	15
TER-12-084	RC	766,944.98	6,577,046.91	345.57	12.00	-	(90.00)	9/21/2012	12
TER-12-085	RC	766,903.05	6,577,025.60	351.43	15.00	-	(90.00)	9/21/2012	15
TER-12-086	RC	766,879.08	6,577,067.31	348.71	12.00	-	(90.00)	9/21/2012	12
TER-12-087	RC	766,920.59	6,577,088.95	346.50	12.00	-	(90.00)	9/21/2012	12
TER-12-088	RC	767,852.34	6,577,404.55	350.97	12.00	-	(90.00)	9/24/2012	12
TER-12-089	RC	767,877.57	6,577,433.43	350.49	27.00	-	(90.00)	9/24/2012	27
TER-12-090	RC	767,828.84	6,577,415.15	354.45	25.00	-	(90.00)	9/24/2012	25
TER-12-091	RC	767,784.34	6,577,501.78	349.57	14.00	-	(90.00)	9/24/2012	14
TER-12-092	RC	767,937.28	6,577,519.38	335.58	17.00	150.00	(60.00)	9/24/2012	17
TER-12-093	RC	767,962.21	6,577,487.15	334.97	13.00	-	(90.00)	9/24/2012	13
TER-12-094	RC	767,787.03	6,577,390.52	354.08	25.00	-	(90.00)	9/24/2012	25
TER-12-095	RC	767,737.01	6,577,477.88	350.96	15.00	-	(90.00)	9/24/2012	15
TER-12-096	RC	767,693.93	6,577,452.94	351.70	16.00	-	(90.00)	9/24/2012	16
TER-12-097	RC	767,745.17	6,577,366.73	355.07	21.00	-	(90.00)	9/24/2012	21
TER-12-098	RC	767,598.05	6,577,222.58	364.77	24.00	-	(90.00)	9/24/2012	24
TER-12-099	RC	767,474.42	6,577,137.37	365.02	30.00	150.00	(60.00)	9/25/2012	30
TER-12-100	RC	766,805.64	6,577,079.95	345.32	50.00	-	(90.00)	9/26/2012	50
TER-12-101	RC	766,657.00	6,577,169.46	346.21	50.00	-	(90.00)	9/26/2012	50
TER-12-102	RC	767,114.23	6,578,014.31	326.99	50.00	-	(90.00)	9/26/2012	50
TER-12-103	RC	767,017.08	6,577,977.43	318.09	50.00	-	(90.00)	9/26/2012	50
TER-12-104	RC	767,092.97	6,578,061.32	328.30	50.00	-	(90.00)	9/27/2012	50
TER-12-105	RC	767,255.75	6,578,047.37	324.51	50.00	150.00	(60.00)	9/27/2012	50
TER-14-106	RC	767,370.91	6,576,921.32	361.02	17.00	-	(90.00)	25/11/2014	17
TER-14-107	RC	767,308.57	6,576,930.23	362.80	35.00	-	(90.00)	1/12/2014	35
TER-14-108	RC	767,276.83	6,576,881.93	367.31	38.00	-	(90.00)	2/12/2014	38
TER-14-109	RC	767,225.16	6,576,846.72	368.54	32.00	-	(90.00)	3/12/2014	32
TER-14-110	RC	767,195.32	6,576,821.62	369.10	44.00	-	(90.00)	3/12/2014	44
TER-14-111	RC	767,161.64	6,576,780.76	368.99	39.00	-	(90.00)	4/12/2014	39
TER-14-112	RC	767,124.84	6,576,752.19	368.00	33.00	-	(90.00)	4/12/2014	33
TER-14-113	RC	767,085.08	6,576,727.51	368.75	36.00	-	(90.00)	5/12/2014	36
TER-14-114	RC	767,034.83	6,576,694.47	367.21	40.00	-	(90.00)	5/12/2014	40
TER-14-115	RC	766,995.24	6,576,673.01	365.11	35.00	-	(90.00)	6/12/2014	35
TER-14-116	RC	766,960.42	6,576,624.73	363.99	23.00	-	(90.00)	6/12/2014	23
TER-14-117	RC	767,457.28	6,576,973.42	359.35	29.00	-	(90.00)	8/12/2014	29
TER-14-118	RC	767,481.89	6,576,940.71	356.64	27.00	-	(90.00)	8/12/2014	27
TER-14-119	RC	767,406.11	6,576,965.66	359.65	30.00	-	(90.00)	8/12/2014	30
TER-14-120	RC	766,928.54	6,576,591.80	363.50	23.00	-	(90.00)	9/12/2014	23
TER-14-121	RC	766,889.09	6,576,561.79	362.71	24.00	-	(90.00)	9/12/2014	24
TER-14-122	RC	766,847.96	6,576,521.55	362.21	25.00	-	(90.00)	9/12/2014	25
TER-14-123	RC	766,815.38	6,576,477.83	359.51	23.00	-	(90.00)	9/12/2014	23
TER-14-124	RC	766,779.30	6,576,438.38	356.69	18.00	-	(90.00)	9/12/2014	18
TER-14-125	RC	766,738.04	6,576,400.88	352.40	14.00	-	(90.00)	9/12/2014	14

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TER-14-126	RC	766,311.46	6,576,244.03	326.92	15.00	-	(90.00)	10/12/2014	15
TER-14-127	RC	766,280.18	6,576,287.74	325.82	10.00	-	(90.00)	10/12/2014	10
TER-14-128	RC	766,328.87	6,576,324.57	323.33	30.00	-	(90.00)	12/15/2014	30
TER-14-129	RC	766,277.14	6,576,221.22	327.54	16.00	-	(90.00)	12/15/2014	16
TER-14-130	RC	766,258.22	6,576,334.60	323.17	14.00	-	(90.00)	12/15/2014	14
TER-14-131	RC	766,298.89	6,576,364.50	317.80	9.00	-	(90.00)	12/16/2014	9
TER-14-132	RC	766,349.24	6,576,374.03	318.79	13.00	-	(90.00)	12/16/2014	13
TER-14-133	RC	766,381.52	6,576,414.41	321.01	12.00	-	(90.00)	12/16/2014	12
TER-14-134	RC	766,421.07	6,576,437.47	325.10	15.00	-	(90.00)	12/16/2014	15
TER-14-135	RC	766,502.81	6,576,512.85	336.28	13.00	-	(90.00)	12/16/2014	13
TER-14-136	RC	766,566.21	6,576,582.82	337.95	15.00	-	(90.00)	12/16/2014	15
TER-14-137	RC	766,545.98	6,576,552.45	338.88	13.00	-	(90.00)	12/17/2014	13
TER-14-138	RC	766,655.54	6,576,666.44	342.75	17.00	-	(90.00)	12/17/2014	17
TER-14-139	RC	766,686.78	6,576,704.04	342.08	16.00	-	(90.00)	12/17/2014	16
TER-14-140	RC	766,722.71	6,576,762.39	351.00	18.00	-	(90.00)	17/12/2014	18
TER-14-141	RC	766,757.94	6,576,781.89	352.05	17.00	-	(90.00)	17/12/2014	17
TER-14-142	RC	766,799.19	6,576,805.17	352.42	19.00	-	(90.00)	17/12/2014	19
TER-14-143	RC	766,857.86	6,576,813.20	356.22	10.00	-	(90.00)	17/12/2014	10
TER-14-144	RC	766,876.82	6,576,885.10	353.92	13.00	-	(90.00)	17/12/2014	13
TER-14-145	RC	766,936.56	6,576,976.52	349.68	11.00	-	(90.00)	18/12/2014	11
TER-14-146	RC	767,430.12	6,576,916.90	358.75	29.00	-	(90.00)	18/12/2014	29
TER-14-147	RC	767,454.91	6,576,881.60	356.71	31.00	-	(90.00)	18/12/2014	31
TER-14-148	RC	767,398.26	6,576,871.49	358.45	32.00	-	(90.00)	18/12/2014	32
TER-14-149	RC	767,339.84	6,576,875.97	362.65	37.00	-	(90.00)	18/12/2014	37
TER-15-150	RC	767,510.82	6,576,909.67	355.92	45.00	-	(90.00)	1/19/2015	45
TER-15-151	RC	767,540.98	6,576,929.91	354.69	52.00	-	(90.00)	1/20/2015	52
TER-15-152	RC	766,647.79	6,576,348.76	351.97	17.00	-	(90.00)	1/21/2015	17
TER-15-153	RC	766,612.35	6,576,329.43	349.06	14.00	-	(90.00)	1/21/2015	14
TER-15-154	RC	767,003.80	6,576,959.70	348.89	15.00	-	(90.00)	1/22/2015	15
TER-16-155	RC	767380.998	6576886.381	353.746	35.00	0.00	-90.00	22/11/2016	35
TER-16-156	RC	767353.716	6576943.546	354.390	45.00	0.00	-90.00	23/11/2016	45
TER-16-157	RC	767326.543	6576905.488	357.681	36.00	0.00	-90.00	23/11/2016	36
TER-16-158	RC	767347.904	6576854.153	354.493	63.00	0.00	-90.00	24/11/2016	63
TER-16-159	RC	767303.156	6576838.518	357.116	96.00	0.00	-90.00	25/11/2016	96
TER-16-160	RC	767285.715	6576861.781	359.883	125.00	0.00	-90.00	28/11/2016	125
TER-16-161	RC	767256.015	6576925.163	356.243	40.00	150.00	-60.00	28/11/2016	40
TER-16-162	RC	767250.390	6576825.668	360.898	73.00	0.00	-90.00	29/11/2016	73
TER-16-163	RC	767174.073	6576761.418	360.785	50.00	0.00	-90.00	29/11/2016	50
TER-16-164	RC	767089.733	6576705.321	361.493	100.00	0.00	-90.00	30/11/2016	100
TER-16-165	RC	767052.012	6576671.944	361.465	101.00	0.00	-90.00	01/12/2016	101
TER-16-166	RC	767020.497	6576642.511	360.346	45.00	0.00	-90.00	01/12/2016	45
TER-16-167	RC	766972.807	6576613.282	358.417	90.00	0.00	-90.00	02/12/2016	90
TER-16-168	RC	766239.226	6576269.402	320.112	80.00	0.00	-90.00	02/12/2016	80
TER-16-169	RC	766196.416	6576248.129	312.640	15.00	0.00	-90.00	02/12/2016	15
TER-16-170	RC	766275.801	6576303.688	318.021	70.00	0.00	-90.00	03/12/2016	70
TER-16-171	RC	766378.884	6576331.775	320.168	30.00	0.00	-90.00	05/12/2016	30
TER-16-172	RC	766312.289	6576341.799	313.964	63.00	0.00	-90.00	05/12/2016	63
TER-16-173	RC	767529.076	6576937.878	348.190	60.00	0.00	-90.00	05/12/2016	60
TER-16-174	RC	767513.121	6576961.687	348.190	40.00	0.00	-90.00	06/12/2016	40
TER-16-175	RC	767554.533	6576992.856	346.583	30.00	0.00	-90.00	06/12/2016	30
TER-16-176	RC	767439.104	6577005.586	352.409	28.00	0.00	-90.00	06/12/2016	28
TER-16-177	RC	767450.061	6577078.866	356.491	100.00	0.00	-90.00	07/12/2016	100
TER-16-178	RC	767426.126	6577117.403	351.836	60.00	0.00	-90.00	07/12/2016	60
TER-16-179	RC	767495.760	6577100.294	360.222	66.00	0.00	-90.00	07/12/2016	66
TER-16-180	RC	767531.730	6577136.926	359.779	45.00	0.00	-90.00	08/12/2016	45
TER-16-181	RC	767641.241	6577243.007	355.653	38.00	0.00	-90.00	08/12/2016	38
TER-16-182	RC	767627.559	6577278.493	353.680	30.00	0.00	-90.00	08/12/2016	30
TER-16-183	RC	767695.703	6577345.961	349.727	27.00	0.00	-90.00	15/12/2016	27
TER-16-184	RC	767678.264	6577380.651	346.205	23.00	0.00	-90.00	15/12/2016	23
TER-16-185	RC	767668.814	6577395.326	344.677	25.00	0.00	-90.00	15/12/2016	25
TER-16-186	RC	767635.300	6577354.811	345.376	20.00	0.00	-90.00	15/12/2016	20
TER-16-187	RC	767716.244	6577415.180	346.318	25.00	0.00	-90.00	15/12/2016	25
TER-16-188	RC	767739.301	6577373.464	348.188	60.00	0.00	-90.00	15/12/2016	60
TER-16-189	RC	767756.167	6577444.081	345.874	53.00	0.00	-90.00	16/12/2016	53
TER-16-190	RC	767817.954	6577450.571	345.793	30.00	0.00	-90.00	16/12/2016	30
TER-16-191	RC	767850.622	6577481.785	342.698	25.00	0.00	-90.00	16/12/2016	25

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TER-16-192	RC	768090.222	6577569.479	318.625	20.00	0.00	-90.00	16/12/2016	20
TER-16-193	RC	768131.132	6577599.712	322.905	20.00	0.00	-90.00	17/12/2016	20
TER-16-194	RC	768004.374	6577516.778	321.493	20.00	0.00	-90.00	17/12/2016	20
TER-16-195	RC	767607.924	6577312.346	350.491	40.00	0.00	-90.00	17/12/2016	40
TER-16-196	RC	767456.847	6577266.660	349.702	30.00	0.00	-90.00	17/12/2016	30
TER-17-197	RC	767496.085	6576918.180	349.771	48.00	0.00	-90.00	06/01/2017	48
TER-17-198	RC	767363.614	6577046.806	345.871	80.00	0.00	-90.00	09/01/2017	80
TER-17-199	RC	767338.570	6577187.927	336.536	25.00	0.00	-90.00	09/01/2017	25
TER-17-200	RC	767436.735	6576895.874	351.467	50.00	0.00	-90.00	09/01/2017	50
TER-17-201	RC	767349.726	6576970.127	353.073	29.00	0.00	-90.00	10/01/2017	29
TER-17-202	RC	767420.255	6576933.340	352.995	40.00	0.00	-90.00	10/01/2017	40
TER-17-203	RC	767382.162	6576989.881	352.040	40.00	0.00	-90.00	10/01/2017	40
TER-17-204	RC	767207.597	6577097.222	352.951	22.00	0.00	-90.00	11/01/2017	22
TER-17-205	RC	767032.631	6576998.728	342.986	65.00	0.00	-90.00	20/01/2017	65
TER-17-206	RC	767045.238	6576973.781	347.554	80.00	0.00	-90.00	18/01/2017	80
TER-17-207	RC	767056.907	6577040.708	343.899	25.00	0.00	-90.00	18/01/2017	25
TER-17-208	RC	767361.611	6577023.087	349.396	37.00	0.00	-90.00	18/01/2017	37
TER-17-209	RC	767177.222	6577044.788	354.903	55.00	0.00	-90.00	19/01/2017	55
TER-17-210	RC	767153.327	6577086.480	352.118	30.00	0.00	-90.00	19/01/2017	30
TER-17-211	RC	767106.549	6577075.446	346.557	40.00	0.00	-90.00	19/01/2017	40
TER-17-212	RC	766934.616	6576867.578	349.603	100.00	0.00	-90.00	20/01/2017	100
TER-17-213	RC	766927.470	6576882.866	348.646	60.00	0.00	-90.00	26/01/2017	60
TER-17-214	RC	766956.971	6576924.723	343.008	100.00	0.00	-90.00	27/01/2017	100
TER-17-215	RC	766887.146	6576847.921	349.292	60.00	0.00	-90.00	27/01/2017	60
TER-17-216	RC	766841.607	6576832.520	346.933	120.00	0.00	-90.00	28/01/2017	120
TER-17-217	RC	766809.412	6576781.694	348.520	35.00	0.00	-90.00	28/01/2017	35
TER-17-218	RC	766740.046	6576706.645	338.522	40.00	0.00	-90.00	28/01/2017	40
TER-17-219	RC	766623.975	6576611.477	334.179	35.00	0.00	-90.00	30/01/2017	35
TER-17-220	RC	766552.510	6576531.625	334.212	25.00	0.00	-90.00	30/01/2017	25
TER-17-221	RC	766538.421	6576556.249	331.787	30.00	0.00	-90.00	30/01/2017	30
TER-17-222	RC	766513.169	6576505.656	331.540	25.00	0.00	-90.00	30/01/2017	25
TER-17-223	RC	766475.294	6576478.146	324.842	40.00	0.00	-90.00	31/01/2017	40
TER-17-224	RC	766434.277	6576415.368	322.340	35.00	0.00	-90.00	31/01/2017	35
TER-17-225	RC	766826.364	6576510.023	354.703	80.00	0.00	-90.00	01/02/2017	80
TER-17-226	RC	766913.267	6576581.091	356.515	80.00	0.00	-90.00	01/02/2017	80
TER-17-227	RC	766895.612	6576543.750	356.481	80.00	0.00	-90.00	03/02/2017	80
TER-17-228	RC	766870.654	6576533.712	356.811	80.00	0.00	-90.00	04/02/2017	80
TER-17-229	RC	766858.074	6576524.903	356.549	80.00	0.00	-90.00	06/02/2017	80
TER-17-230	RC	766758.462	6576426.355	348.168	80.00	0.00	-90.00	06/02/2017	80
TER-17-231	RC	766700.862	6576373.752	343.658	25.00	0.00	-90.00	06/02/2017	25
TER-17-232	RC	766735.617	6576418.374	347.387	100.00	0.00	-90.00	07/02/2017	100
TER-17-233	RC	767593.272	6577326.130	347.639	25.00	0.00	-90.00	07/02/2017	25
TER-17-234	RC	768056.919	6577551.876	313.843	18.00	0.00	-90.00	07/02/2017	18
TER-17-235	RC	767221.202	6576770.457	359.954	40.00	0.00	-90.00	08/02/2017	40
TER-17-236	RC	767246.984	6576727.507	355.295	70.00	0.00	-90.00	08/02/2017	70
TER-17-237	RC	767213.045	6576864.719	361.312	47.00	0.00	-90.00	09/02/2017	47
TER-17-238	RC	767366.191	6576839.464	351.820	35.00	0.00	-90.00	11/05/2017	35
TER-17-239	RC	767410.946	6576850.098	350.061	30.00	0.00	-90.00	11/05/2017	30
TER-17-240	RC	767429.400	6576865.657	350.142	24.00	0.00	-90.00	16/05/2017	24
TER-17-241	RC	767462.061	6576861.661	348.992	33.00	0.00	-90.00	16/05/2017	33
TER-17-242	RC	767520.394	6576893.790	348.615	35.00	0.00	-90.00	17/05/2017	35
TER-17-243	RC	767537.731	6576906.551	348.392	43.00	0.00	-90.00	17/05/2017	43
TER-17-244	RC	767346.168	6576824.207	352.648	48.00	150.00	-60.00	18/05/2017	48
TET-11-001	Auger	767,421.66	6,577,226.83	354.63	9.00	-	(90.00)	9/28/2011	9
TET-11-002	Auger	767,393.59	6,577,273.55	350.93	6.00	-	(90.00)	9/29/2011	6
TET-11-003	Auger	767,441.31	6,577,182.93	358.75	8.00	-	(90.00)	9/30/2011	8
TET-11-004	Auger	767,236.81	6,577,139.49	355.65	9.00	-	(90.00)	10/4/2011	9
TET-11-005	Auger	767,564.34	6,577,375.31	347.96	6.00	-	(90.00)	10/5/2011	6
TET-11-006	Auger	767,586.15	6,577,332.30	353.29	6.00	-	(90.00)	10/6/2011	6
TET-11-007	Auger	767,262.72	6,577,088.94	356.86	4.70	-	(90.00)	10/7/2011	5
TET-11-008	Auger	767,213.44	6,577,183.72	352.69	8.00	-	(90.00)	10/12/2011	8
TET-11-009	Auger	767,188.28	6,577,226.21	348.21	5.00	-	(90.00)	10/13/2011	5
TET-11-010	Auger	767,742.73	6,577,464.33	351.88	7.00	-	(90.00)	10/19/2011	7
TET-11-011	Auger	767,719.68	6,577,507.52	348.73	3.50	-	(90.00)	10/21/2011	4
TET-11-012	Auger	767,929.04	6,577,559.11	334.25	4.00	-	(90.00)	10/24/2011	4
TET-11-013	Auger	768,054.21	6,577,516.65	318.21	3.50	-	(90.00)	10/25/2011	4

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TET-11-014	Auger	768,089.39	6,577,546.21	321.56	5.50	-	(90.00)	10/27/2011	6
TET-11-015	Auger	768,132.85	6,577,546.19	324.06	4.00	-	(90.00)	10/28/2011	4
TET-11-016	Auger	768,031.40	6,577,580.12	324.86	7.00	-	(90.00)	11/3/2011	7
TET-11-017	Auger	768,413.16	6,577,671.30	301.87	3.00	-	(90.00)	11/5/2011	3
TET-11-018	Auger	768,213.45	6,577,243.28	341.62	6.00	-	(90.00)	11/10/2011	6
TET-11-019	Auger	767,961.64	6,577,473.98	337.26	2.70	-	(90.00)	11/22/2011	3
TET-11-020	Auger	767,768.66	6,577,418.44	353.16	6.00	-	(90.00)	11/23/2011	6
TET-11-021	Auger	767,793.27	6,577,378.95	353.87	10.00	-	(90.00)	11/25/2011	10
TET-11-022	Auger	767,613.65	6,577,285.24	359.27	10.00	-	(90.00)	11/28/2011	10
TET-11-023	Auger	767,637.43	6,577,243.10	362.66	10.00	-	(90.00)	11/29/2011	10
TET-11-024	Auger	767,465.36	6,577,137.79	363.63	10.00	-	(90.00)	12/1/2011	10
TET-11-025	Auger	767,491.86	6,577,094.21	366.47	10.00	-	(90.00)	12/7/2011	10
TET-11-026	Auger	767,051.28	6,577,058.68	348.05	6.00	-	(90.00)	12/8/2011	6
TET-12-027	Auger	768,177.71	6,577,633.07	324.58	5.60	-	(90.00)	2/8/2012	6
TET-12-028	Auger	768,232.92	6,577,670.56	318.66	3.00	-	(90.00)	2/8/2012	3
TET-12-029	Auger	768,537.00	6,577,370.36	331.64	2.00	-	(90.00)	2/9/2012	2
TET-12-030	Auger	768,516.73	6,577,404.17	340.00	3.00	-	(90.00)	2/13/2012	3
TET-12-031	Auger	768,499.23	6,577,437.87	337.55	4.00	-	(90.00)	2/13/2012	4
TET-12-032	Auger	768,447.81	6,577,319.80	342.11	3.00	-	(90.00)	2/14/2012	3
TET-12-033	Auger	768,432.17	6,577,354.51	340.85	8.00	-	(90.00)	2/15/2012	8
TET-12-034	Auger	768,410.89	6,577,389.53	333.80	5.45	-	(90.00)	2/15/2012	5
TET-12-035	Auger	768,364.36	6,577,270.65	335.19	3.43	-	(90.00)	2/16/2012	4
TET-12-036	Auger	768,348.47	6,577,308.64	331.56	4.00	-	(90.00)	2/17/2012	4
TET-12-037	Auger	768,275.32	6,577,220.69	340.83	2.00	-	(90.00)	2/20/2012	2
TET-12-038	Auger	768,254.55	6,577,257.78	344.13	5.50	-	(90.00)	2/20/2012	6
TET-12-039	Auger	768,238.80	6,577,290.30	344.16	4.00	-	(90.00)	2/22/2012	4
TET-12-040	Auger	768,185.58	6,577,175.27	335.88	5.00	-	(90.00)	2/23/2012	5
TET-12-041	Auger	768,171.60	6,577,210.85	331.73	3.80	-	(90.00)	2/23/2012	4
TET-12-042	Auger	768,145.80	6,577,243.46	333.30	8.00	-	(90.00)	2/25/2012	8
TET-12-043	Auger	768,129.70	6,577,274.65	330.91	6.80	-	(90.00)	2/27/2012	7
TET-12-044	Auger	768,104.48	6,577,117.98	330.64	8.00	-	(90.00)	2/28/2012	8
TET-12-045	Auger	768,085.76	6,577,162.16	325.96	5.00	-	(90.00)	3/1/2012	5
TET-12-046	Auger	768,066.89	6,577,190.61	322.21	3.00	-	(90.00)	3/6/2012	3
TET-12-047	Auger	768,017.47	6,577,067.51	333.00	6.00	-	(90.00)	3/8/2012	6
TET-12-048	Auger	767,996.61	6,577,106.49	323.14	3.00	-	(90.00)	3/8/2012	3
TET-12-049	Auger	767,971.93	6,577,149.32	333.59	6.00	-	(90.00)	3/9/2012	6
TET-12-050	Auger	767,930.51	6,577,022.23	330.36	5.00	-	(90.00)	3/10/2012	5
TET-12-051	Auger	767,910.56	6,577,059.00	329.42	4.60	-	(90.00)	3/12/2012	5
TET-12-052	Auger	767,889.83	6,577,088.38	338.46	5.00	-	(90.00)	3/12/2012	5
TET-12-053	Auger	767,826.40	6,577,007.50	343.48	5.85	-	(90.00)	3/13/2012	6
TET-12-054	Auger	768,215.10	6,577,479.62	311.88	3.70	-	(90.00)	3/13/2012	4
TET-12-055	Auger	767,110.75	6,577,078.30	354.13	4.75	-	(90.00)	3/14/2012	5
TET-12-056	Auger	768,198.49	6,577,514.04	306.99	2.30	-	(90.00)	3/14/2012	3
TET-12-057	Auger	767,310.92	6,578,034.36	315.37	2.85	-	(90.00)	3/15/2012	3
TET-12-058	Auger	768,170.00	6,577,547.00	321.00	3.00	-	(90.00)	3/14/2012	3
TET-12-059	Auger	767,291.73	6,578,082.12	318.29	13.00	-	(90.00)	3/16/2012	13
TET-12-060	Auger	768,109.45	6,577,466.79	311.58	3.25	-	(90.00)	3/15/2012	4
TET-12-061	Auger	767,268.00	6,578,125.00	312.00	5.70	-	(90.00)	3/19/2012	6
TET-12-062	Auger	768,088.36	6,577,500.41	312.72	2.35	-	(90.00)	3/15/2012	3
TET-12-063	Auger	767,120.01	6,577,963.32	330.61	8.00	-	(90.00)	3/19/2012	8
TET-12-064	Auger	767,215.49	6,578,000.23	330.68	2.00	-	(90.00)	3/16/2012	2
TET-12-065	Auger	767,106.07	6,578,013.74	326.42	7.65	-	(90.00)	3/20/2012	8
TET-12-066	Auger	767,198.39	6,578,046.84	331.57	6.00	-	(90.00)	3/16/2012	6
TET-12-067	Auger	767,089.03	6,578,059.42	328.46	8.00	-	(90.00)	3/21/2012	8
TET-12-068	Auger	767,180.06	6,578,091.55	329.81	10.00	-	(90.00)	3/19/2012	10
TET-12-069	Auger	767,068.94	6,578,103.95	325.34	7.00	-	(90.00)	3/22/2012	7
TET-12-070	Auger	767,164.43	6,578,140.33	326.33	7.00	-	(90.00)	3/20/2012	7
TET-12-071	Auger	766,977.17	6,578,068.99	314.42	4.70	-	(90.00)	3/22/2012	5
TET-12-072	Auger	767,027.01	6,577,930.79	320.67	5.00	-	(90.00)	3/21/2012	5
TET-12-073	Auger	766,878.73	6,578,038.90	300.48	3.75	-	(90.00)	3/23/2012	4
TET-12-074	Auger	767,007.65	6,577,981.72	318.07	9.00	-	(90.00)	3/22/2012	9
TET-12-075	Auger	766,834.71	6,577,966.42	313.79	7.75	-	(90.00)	3/24/2012	8
TET-12-076	Auger	766,993.40	6,578,024.32	311.67	4.00	-	(90.00)	3/22/2012	4
TET-12-077	Auger	766,784.19	6,578,002.72	312.06	4.35	-	(90.00)	3/24/2012	5
TET-12-078	Auger	766,819.74	6,577,908.59	315.61	5.00	-	(90.00)	3/26/2012	5
TET-12-079	Auger	766,839.68	6,577,862.33	313.78	5.00	-	(90.00)	3/26/2012	5

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TET-12-080	Auger	766,933.79	6,577,897.75	310.50	8.00	-	(90.00)	3/27/2012	8
TET-12-081	Auger	766,914.99	6,577,943.87	306.33	4.00	-	(90.00)	3/27/2012	4
TET-12-082	Auger	766,904.06	6,577,996.23	302.43	3.45	-	(90.00)	3/28/2012	4
TET-12-083	Auger	768,207.47	6,577,587.54	327.16	4.30	-	(90.00)	3/28/2012	5
TET-12-084	Auger	768,070.53	6,577,900.56	336.93	4.50	-	(90.00)	3/29/2012	5
TET-12-085	Auger	768,068.14	6,577,954.29	338.93	5.50	-	(90.00)	3/29/2012	6
TET-12-086	Auger	768,069.90	6,578,002.11	338.22	3.00	-	(90.00)	3/29/2012	3
TET-12-087	Auger	768,070.23	6,578,051.49	328.06	8.50	-	(90.00)	3/30/2012	9
TET-12-088	Auger	768,167.31	6,578,054.26	333.58	5.00	-	(90.00)	3/31/2012	5
TET-12-089	Auger	768,167.29	6,578,005.44	335.31	4.00	-	(90.00)	3/31/2012	4
TET-12-090	Auger	768,168.70	6,577,952.77	331.50	4.00	-	(90.00)	3/31/2012	4
TET-12-091	Auger	767,967.04	6,577,902.81	344.07	5.00	-	(90.00)	4/2/2012	5
TET-12-092	Auger	767,967.74	6,577,954.90	342.51	3.00	-	(90.00)	4/2/2012	3
TET-12-093	Auger	767,967.55	6,578,001.61	343.21	2.00	-	(90.00)	4/3/2012	2
TET-12-094	Auger	767,966.99	6,578,054.71	335.92	5.00	-	(90.00)	4/3/2012	5
TET-12-095	Auger	767,960.69	6,577,789.43	345.56	4.80	-	(90.00)	4/4/2012	5
TET-12-096	Auger	767,961.73	6,577,744.97	343.16	5.00	-	(90.00)	4/4/2012	5
TET-12-097	Auger	767,958.64	6,577,692.99	343.29	3.70	-	(90.00)	4/5/2012	4
TET-12-098	Auger	768,147.47	6,577,683.24	321.10	5.55	-	(90.00)	4/9/2012	6
TET-12-099	Auger	767,672.93	6,577,526.94	349.59	6.00	-	(90.00)	4/10/2012	6
TET-12-100	Auger	767,687.83	6,577,500.05	351.63	6.00	-	(90.00)	4/11/2012	6
TET-12-101	Auger	767,461.40	6,577,540.82	347.12	5.00	-	(90.00)	4/11/2012	5
TET-12-102	Auger	766,708.94	6,577,079.63	346.01	6.00	-	(90.00)	4/12/2012	6
TET-12-103	Auger	766,805.12	6,577,079.89	345.99	3.45	-	(90.00)	4/13/2012	4
TET-12-104	Auger	766,906.28	6,577,081.19	348.05	3.70	-	(90.00)	4/13/2012	4
TET-12-105	Auger	766,605.90	6,577,079.62	349.45	4.65	-	(90.00)	4/14/2012	5
TET-12-106	Auger	766,583.19	6,577,110.16	350.95	3.00	-	(90.00)	4/16/2012	3
TET-12-107	Auger	766,681.38	6,577,128.30	347.23	4.75	-	(90.00)	4/16/2012	5
TET-12-108	Auger	766,764.25	6,577,138.80	342.67	2.75	-	(90.00)	4/17/2012	3
TET-12-109	Auger	766,880.18	6,577,128.13	343.10	3.75	-	(90.00)	4/17/2012	4
TET-12-110	Auger	766,554.77	6,577,170.59	351.74	3.70	-	(90.00)	4/18/2012	4
TET-12-111	Auger	766,656.66	6,577,168.97	347.02	5.00	-	(90.00)	4/18/2012	5
TET-12-112	Auger	766,755.81	6,577,170.24	347.29	2.60	-	(90.00)	4/19/2012	3
TET-12-113	Auger	766,855.77	6,577,168.81	336.25	1.50	-	(90.00)	4/19/2012	2
TET-12-114	Auger	766,531.33	6,577,222.27	351.91	3.50	-	(90.00)	4/20/2012	4
TET-12-115	Auger	766,632.77	6,577,221.59	348.02	5.00	-	(90.00)	4/20/2012	5
TET-12-116	Auger	766,732.28	6,577,214.20	342.79	3.00	-	(90.00)	4/23/2012	3
TET-12-117	Auger	766,831.44	6,577,216.09	337.77	2.90	-	(90.00)	4/23/2012	3
TET-12-118	Auger	766,806.91	6,577,252.00	341.05	4.50	-	(90.00)	4/24/2012	5
TET-12-119	Auger	766,701.16	6,577,266.10	340.57	5.00	-	(90.00)	4/25/2012	5
TET-12-120	Auger	766,603.82	6,577,260.77	353.64	9.00	-	(90.00)	4/25/2012	9
TET-12-121	Auger	767,003.04	6,577,077.92	341.65	3.45	-	(90.00)	4/26/2012	4
TET-12-122	Auger	767,854.18	6,577,465.46	351.97	11.80	-	(90.00)	4/28/2012	12
TET-12-123	Auger	767,864.81	6,577,446.02	354.54	6.35	-	(90.00)	4/28/2012	7
TET-12-124	Auger	767,706.38	6,577,322.98	359.08	13.00	-	(90.00)	4/30/2012	13
TET-12-125	Auger	767,552.27	6,577,197.87	367.07	10.35	-	(90.00)	5/3/2012	11
TET-12-126	Auger	767,407.54	6,577,035.02	357.63	13.00	-	(90.00)	5/4/2012	13
TET-12-127	Auger	767,381.08	6,577,079.97	352.37	9.00	-	(90.00)	5/10/2012	9
TET-12-128	Auger	767,524.55	6,577,234.50	363.02	10.00	-	(90.00)	5/14/2012	10
TET-12-129	Auger	767,561.72	6,577,173.36	366.95	14.00	-	(90.00)	5/16/2012	14
TET-12-130	Auger	767,497.81	6,577,280.82	357.33	12.90	-	(90.00)	5/17/2012	13
TET-12-131	Auger	767,681.68	6,577,366.88	354.76	8.85	-	(90.00)	5/18/2012	9
TET-12-132	Auger	767,658.20	6,577,410.38	351.27	9.00	-	(90.00)	5/19/2012	9
TET-12-133	Auger	767,628.30	6,577,466.71	343.70	7.00	-	(90.00)	5/21/2012	7
TET-12-134	Auger	767,085.30	6,577,041.09	351.24	7.60	-	(90.00)	5/22/2012	8
TET-12-135	Auger	767,299.26	6,577,196.82	342.14	1.40	-	(90.00)	5/23/2012	2
TET-12-136	Auger	768,144.24	6,577,626.38	327.56	6.00	-	(90.00)	5/23/2012	6
TET-12-137	Auger	766,261.71	6,577,354.80	350.90	6.50	-	(90.00)	5/24/2012	7
TET-12-138	Auger	766,264.29	6,577,408.21	349.09	6.00	-	(90.00)	5/24/2012	6
TET-12-139	Auger	766,259.20	6,577,450.21	343.85	5.00	-	(90.00)	5/25/2012	5
TET-12-140	Auger	765,487.39	6,577,552.97	338.60	11.50	-	(90.00)	5/26/2012	12
TET-12-141	Auger	765,485.49	6,577,645.70	341.85	14.00	-	(90.00)	5/29/2012	14
TET-12-142	Auger	767,858.96	6,577,457.61	352.80	15.63	-	(90.00)	5/31/2012	20
TET-12-143	Auger	767,871.00	6,577,436.50	352.59	12.32	-	(90.00)	6/2/2012	16
TET-12-144	Auger	767,703.82	6,577,322.09	359.04	12.60	-	(90.00)	6/5/2012	15
TET-12-145	Auger	767,547.58	6,577,196.16	367.10	9.87	-	(90.00)	6/6/2012	12

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TET-12-146	Auger	767,564.60	6,577,162.87	365.66	13.15	-	(90.00)	6/7/2012	19
TET-12-147	Auger	765,483.90	6,577,745.73	344.28	13.70	-	(90.00)	6/12/2012	14
TET-12-148	Auger	765,486.25	6,577,848.38	335.52	10.00	-	(90.00)	6/13/2012	10
TET-12-149	Auger	765,486.89	6,577,946.73	332.90	10.00	-	(90.00)	6/15/2012	10
TET-12-150	Auger	765,586.08	6,577,888.55	321.68	3.00	-	(90.00)	6/16/2012	3
TET-12-151	Auger	765,585.88	6,577,799.51	337.16	7.80	-	(90.00)	6/18/2012	8
TET-12-152	Auger	765,585.58	6,577,696.91	346.58	6.90	-	(90.00)	6/18/2012	7
TET-12-153	Auger	765,586.83	6,577,580.44	345.36	8.00	-	(90.00)	6/19/2012	8
TET-12-154	Auger	765,677.10	6,577,647.45	333.56	7.20	-	(90.00)	6/19/2012	8
TET-12-155	Auger	765,676.90	6,577,748.00	327.29	4.60	-	(90.00)	6/19/2012	5
TET-12-156	Auger	765,676.86	6,577,847.68	321.15	7.00	-	(90.00)	6/20/2012	7
TET-12-157	Auger	765,786.36	6,577,847.43	329.96	7.50	-	(90.00)	6/20/2012	8
TET-12-158	Auger	765,786.30	6,577,749.04	337.09	10.00	-	(90.00)	6/22/2012	10
TET-12-159	Auger	765,788.24	6,577,649.17	343.82	11.50	-	(90.00)	6/22/2012	12
TET-12-160	Auger	765,387.76	6,577,946.62	331.04	6.00	-	(90.00)	6/23/2012	6
TET-12-161	Auger	765,386.40	6,577,857.99	342.87	6.00	-	(90.00)	6/23/2012	6
TET-12-162	Auger	765,386.17	6,577,749.60	338.75	5.00	-	(90.00)	6/23/2012	5
TET-12-163	Auger	765,387.03	6,577,649.85	337.49	9.40	-	(90.00)	6/25/2012	10
TET-12-164	Auger	765,387.21	6,577,599.43	334.37	10.00	-	(90.00)	6/27/2012	10
TET-12-165	Auger	765,387.11	6,577,699.03	337.70	6.20	-	(90.00)	6/25/2012	7
TET-12-166	Auger	765,389.01	6,577,798.16	342.29	3.80	-	(90.00)	6/28/2012	4
TET-12-167	Auger	765,387.78	6,577,896.28	335.96	4.90	-	(90.00)	6/28/2012	5
TET-12-168	Auger	765,387.41	6,577,996.71	329.08	6.40	-	(90.00)	6/30/2012	7
TET-12-169	Auger	765,489.39	6,577,600.64	339.61	7.00	-	(90.00)	7/4/2012	7
TET-12-170	Auger	765,488.05	6,577,698.64	345.11	6.00	-	(90.00)	7/5/2012	6
TET-12-171	Auger	765,487.55	6,577,797.79	340.35	10.00	-	(90.00)	7/9/2012	10
TET-12-172	Auger	765,487.39	6,577,897.28	328.36	7.90	-	(90.00)	7/10/2012	8
TET-12-173	Auger	765,488.01	6,577,997.48	341.61	11.00	-	(90.00)	7/11/2012	11
TET-12-174	Auger	765,586.93	6,577,548.99	344.06	5.60	-	(90.00)	7/12/2012	6
TET-12-175	Auger	765,589.45	6,577,647.64	346.34	8.00	-	(90.00)	7/13/2012	8
TET-12-176	Auger	765,587.88	6,577,744.26	339.76	6.00	-	(90.00)	7/14/2012	6
TET-12-177	Auger	768,155.00	6,577,627.00	325.00	9.00	-	(90.00)	10/31/2012	9
TET-12-178	Auger	767,820.00	6,577,437.00	359.00	8.00	-	(90.00)	11/1/2012	8
TET-12-179	Auger	767,584.00	6,577,244.00	362.00	8.30	-	(90.00)	11/3/2012	9
TET-12-180	Auger	767,374.00	6,577,010.00	356.00	10.00	-	(90.00)	11/6/2012	10
TET-12-181	Auger	767,010.00	6,577,025.00	348.00	7.00	-	(90.00)	11/7/2012	7
TET-12-182	Auger	767,362.00	6,577,235.00	346.00	10.00	-	(90.00)	11/8/2012	10
TET-12-183	Auger	767,628.00	6,577,157.00	358.00	5.00	-	(90.00)	11/13/2012	5
TET-12-184	Auger	768,026.00	6,577,540.00	326.00	4.50	-	(90.00)	11/14/2012	5
TET-13-185	Auger	766,850.00	6,576,848.27	357.00	2.65	-	(90.00)	4/19/2013	1
TET-13-186	Auger	766,850.00	6,576,725.00	358.00	2.00	-	(90.00)	4/19/2013	1
TET-13-187	Auger	766,850.00	6,576,525.00	358.00	10.00	-	(90.00)	4/19/2013	1
TET-13-188	Auger	766,651.00	6,576,776.00	314.00	2.00	-	(90.00)	4/20/2013	1
TET-13-189	Auger	766,656.00	6,576,691.00	339.00	3.00	-	(90.00)	4/20/2013	1
TET-13-190	Auger	766,650.00	6,576,600.00	345.00	7.00	-	(90.00)	4/20/2013	1
TET-13-191	Auger	766,650.00	6,576,650.00	345.00	3.00	-	(90.00)	4/22/2013	1
TET-13-192	Auger	766,651.00	6,576,512.00	353.00	1.30	-	(90.00)	4/22/2013	1
TET-13-193	Auger	766,649.00	6,576,405.00	353.00	1.55	-	(90.00)	4/22/2013	1
TET-13-194	Auger	766,651.00	6,576,348.00	352.00	1.60	-	(90.00)	4/22/2013	1
TET-13-195	Auger	766,660.00	6,576,301.00	349.00	1.80	-	(90.00)	4/22/2013	1
TET-13-196	Auger	766,450.00	6,576,350.00	336.00	2.00	-	(90.00)	4/22/2013	1
TET-13-197	Auger	766,448.00	6,576,468.00	332.00	2.50	-	(90.00)	4/23/2013	1
TET-13-198	Auger	766,450.00	6,576,550.00	336.00	1.00	-	(90.00)	4/23/2013	1
TET-13-199	Auger	766,450.00	6,576,625.00	329.00	2.00	-	(90.00)	4/23/2013	1
TET-13-200	Auger	766,850.00	6,576,775.00	361.00	2.00	-	(90.00)	4/23/2013	1
TET-13-201	Auger	766,650.00	6,576,255.00	346.00	2.00	-	(90.00)	4/23/2013	1
TET-13-202	Auger	766,450.00	6,576,410.00	336.00	1.30	-	(90.00)	4/23/2013	1
TET-13-203	Auger	766,450.00	6,576,488.00	331.00	2.60	-	(90.00)	4/24/2013	1
TET-13-204	Auger	766,249.00	6,576,375.00	322.00	2.00	-	(90.00)	4/24/2013	1
TET-13-205	Auger	766,250.00	6,576,302.00	325.00	0.50	-	(90.00)	4/24/2013	1
TET-13-206	Auger	766,250.00	6,576,225.00	334.00	1.00	-	(90.00)	4/24/2013	1
TET-13-207	Auger	766,251.00	6,576,180.00	330.00	1.00	-	(90.00)	4/24/2013	1
TET-13-208	Auger	766,850.00	6,576,891.00	351.00	1.70	-	(90.00)	4/24/2013	1
TET-13-209	Auger	766,866.00	6,576,895.00	357.00	2.00	-	(90.00)	4/25/2013	1
TET-13-210	Auger	767,054.00	6,576,866.00	364.00	2.00	-	(90.00)	4/25/2013	1
TET-13-211	Auger	767,250.00	6,576,950.00	364.00	3.00	-	(90.00)	4/25/2013	1

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TET-13-212	Auger	767,344.00	6,576,951.00	366.00	0.50	-	(90.00)	4/25/2013	1
TET-13-213	Auger	767,446.00	6,576,873.00	355.00	0.50	-	(90.00)	4/25/2013	1
TET-13-214	Auger	766,247.00	6,576,131.00	323.00	4.60	-	(90.00)	4/26/2013	1
TET-13-215	Auger	766,249.00	6,576,155.00	324.00	3.00	-	(90.00)	4/26/2013	1
TET-13-216	Auger	766,253.00	6,576,206.00	339.00	2.00	-	(90.00)	4/26/2013	1
TET-13-217	Auger	766,236.00	6,576,257.00	331.00	2.00	-	(90.00)	4/26/2013	1
TET-13-218	Auger	766,393.00	6,576,256.00	330.00	4.00	-	(90.00)	4/26/2013	1
TET-13-219	Auger	766,751.00	6,576,677.00	348.00	2.00	-	(90.00)	4/29/2013	1
TET-13-220	Auger	766,749.00	6,576,724.00	346.00	3.00	-	(90.00)	4/29/2013	1
TET-13-221	Auger	766,754.00	6,576,750.00	348.00	2.00	-	(90.00)	4/29/2013	1
TET-13-222	Auger	766,749.00	6,576,775.00	352.00	1.00	-	(90.00)	4/29/2013	1
TET-13-223	Auger	766,748.00	6,576,795.00	358.00	2.00	-	(90.00)	4/29/2013	1
TET-13-224	Auger	766,751.00	6,576,782.00	355.00	1.70	-	(90.00)	4/29/2013	1
TET-13-225	Auger	766,746.00	6,576,834.00	354.00	1.00	-	(90.00)	4/29/2013	1
TET-13-226	Auger	766,350.00	6,576,275.00	328.00	3.00	-	(90.00)	4/30/2013	1
TET-13-227	Auger	766,350.00	6,576,300.00	326.00	3.00	-	(90.00)	4/30/2013	1
TET-13-228	Auger	766,350.00	6,576,325.00	324.00	2.40	-	(90.00)	4/30/2013	1
TET-13-229	Auger	766,350.00	6,576,350.00	321.00	2.00	-	(90.00)	4/30/2013	1
TET-13-230	Auger	766,350.00	6,576,375.00	318.00	2.00	-	(90.00)	4/30/2013	1
TET-13-231	Auger	766,350.00	6,576,400.00	318.00	3.00	-	(90.00)	4/30/2013	1
TET-13-232	Auger	766,350.00	6,576,425.00	318.00	3.00	-	(90.00)	5/1/2013	1
TET-13-233	Auger	766,350.00	6,576,450.00	317.00	3.00	-	(90.00)	5/1/2013	1
TET-13-234	Auger	766,550.00	6,576,450.00	350.00	1.25	-	(90.00)	5/1/2013	1
TET-13-235	Auger	766,550.00	6,576,475.00	347.00	2.00	-	(90.00)	5/1/2013	1
TET-13-236	Auger	766,550.00	6,576,500.00	345.00	2.00	-	(90.00)	5/1/2013	1
TET-13-237	Auger	766,550.00	6,576,525.00	344.00	2.00	-	(90.00)	5/1/2013	1
TET-13-238	Auger	766,550.00	6,576,550.00	338.00	3.00	-	(90.00)	5/2/2013	1
TET-13-239	Auger	766,550.00	6,576,575.00	336.00	2.00	-	(90.00)	5/2/2013	1
TET-13-240	Auger	766,550.00	6,576,600.00	335.00	1.20	-	(90.00)	5/2/2013	1
TET-13-241	Auger	766,550.00	6,576,625.00	337.00	3.00	-	(90.00)	5/2/2013	1
TET-13-242	Auger	766,750.00	6,576,500.00	344.00	3.00	-	(90.00)	5/2/2013	1
TET-13-243	Auger	766,750.00	6,576,475.00	351.00	2.00	-	(90.00)	5/6/2013	1
TET-13-244	Auger	766,750.00	6,576,450.00	357.00	3.00	-	(90.00)	5/6/2013	1
TET-13-245	Auger	766,750.00	6,576,425.00	355.00	2.00	-	(90.00)	5/6/2013	1
TET-13-246	Auger	766,750.00	6,576,550.00	356.00	2.00	-	(90.00)	5/6/2013	1
TET-13-247	Auger	766,750.00	6,576,600.00	353.00	3.00	-	(90.00)	5/6/2013	1
TET-13-248	Auger	766,750.00	6,576,400.00	353.00	3.00	-	(90.00)	5/7/2013	1
TET-13-249	Auger	766,750.00	6,576,375.00	356.00	2.00	-	(90.00)	5/7/2013	1
TET-13-250	Auger	766,850.00	6,576,600.00	359.00	2.60	-	(90.00)	5/7/2013	1
TET-13-251	Auger	766,953.00	6,576,800.00	364.00	4.00	-	(90.00)	5/7/2013	1
TET-13-252	Auger	766,950.00	6,576,825.00	361.00	2.00	-	(90.00)	5/8/2013	1
TET-13-253	Auger	766,950.00	6,576,850.00	358.00	3.00	-	(90.00)	5/8/2013	1
TET-13-254	Auger	766,950.00	6,576,875.00	355.00	2.00	-	(90.00)	5/8/2013	1
TET-13-255	Auger	766,750.00	6,576,900.00	352.00	1.00	-	(90.00)	5/8/2013	1
TET-13-256	Auger	766,950.00	6,576,925.00	349.00	3.00	-	(90.00)	5/8/2013	1
TET-13-257	Auger	766,945.00	6,576,775.00	365.00	3.00	-	(90.00)	5/9/2013	1
TET-13-258	Auger	766,950.00	6,576,750.00	365.00	2.00	-	(90.00)	5/9/2013	1
TET-13-259	Auger	766,950.00	6,576,725.00	365.00	3.00	-	(90.00)	5/9/2013	1
TET-13-260	Auger	766,950.00	6,576,700.00	364.00	3.00	-	(90.00)	5/9/2013	1
TET-13-261	Auger	766,950.00	6,576,675.00	362.00	3.00	-	(90.00)	5/9/2013	1
TET-13-262	Auger	766,950.00	6,576,650.00	368.00	2.00	-	(90.00)	5/10/2013	1
TET-13-263	Auger	766,950.00	6,576,625.00	364.00	2.40	-	(90.00)	5/10/2013	1
TET-13-264	Auger	766,950.00	6,576,600.00	364.00	2.00	-	(90.00)	5/10/2013	1
TET-13-265	Auger	766,950.00	6,576,575.00	364.00	3.00	-	(90.00)	5/10/2013	1
TET-13-266	Auger	766,850.00	6,576,550.00	363.00	4.00	-	(90.00)	7/6/2013	1
TET-13-267	Auger	767,050.00	6,576,700.00	374.00	16.00	-	(90.00)	7/8/2013	1
TET-13-268	Auger	767,350.00	6,576,900.00	362.00	15.00	-	(90.00)	7/8/2013	1
TET-13-269	Auger	767,150.00	6,576,800.00	369.00	5.00	-	(90.00)	7/10/2013	1
TET-13-270	Auger	766,750.00	6,576,428.00	358.00	6.00	-	(90.00)	7/10/2013	1
TET-13-271	Auger	767,450.00	6,576,975.00	361.00	5.00	-	(90.00)	7/11/2013	1
TET-13-272	Auger	767,450.00	6,576,923.00	361.00	11.00	-	(90.00)	7/12/2013	1
TET-13-273	Auger	767,250.00	6,576,850.00	369.00	5.00	-	(90.00)	7/15/2013	1
TET-13-274	Auger	767,150.00	6,576,775.00	374.00	15.00	-	(90.00)	7/16/2013	1
TET-13-275	Auger	766,972.00	6,576,644.00	364.00	7.90	-	(90.00)	7/17/2013	1
TET-13-276	Auger	766,850.00	6,576,475.00	363.00	7.00	-	(90.00)	7/17/2013	1
TET-13-277	Auger	766,750.00	6,576,375.00	359.00	5.00	-	(90.00)	7/18/2013	1

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TET-13-278	Auger	766,650.00	6,576,325.00	344.00	6.00	-	(90.00)	7/18/2013	1
TET-13-279	Auger	766,625.00	6,576,288.00	346.00	6.00	-	(90.00)	7/19/2013	1
TET-13-280	Auger	766,400.00	6,576,425.00	326.00	4.90	-	(90.00)	7/20/2013	1
TET-13-281	Auger	766,307.00	6,576,357.00	334.00	2.50	-	(90.00)	7/22/2013	1
TET-13-282	Auger	766,752.00	6,576,599.00	361.00	9.00	-	(90.00)	7/22/2013	1
TET-13-283	Auger	766,651.00	6,576,552.00	347.00	5.90	-	(90.00)	7/23/2013	1
TET-13-284	Auger	766,451.00	6,576,150.00	342.00	3.90	-	(90.00)	7/23/2013	1
TET-13-285	Auger	766,448.00	6,576,101.00	341.00	4.30	-	(90.00)	7/24/2013	1
TET-13-286	Auger	767,147.00	6,576,979.00	370.00	4.90	-	(90.00)	7/24/2013	1
TET-13-287	Auger	767,052.00	6,577,003.00	356.00	5.60	-	(90.00)	7/25/2013	1
TET-13-288	Auger	767,050.00	6,576,925.00	363.00	5.00	-	(90.00)	7/26/2013	1
TET-13-289	Auger	766,950.00	6,576,999.00	345.00	8.00	-	(90.00)	7/29/2013	1
TET-13-290	Auger	766,850.00	6,576,800.00	361.00	4.00	-	(90.00)	7/30/2013	1
TET-13-291	Auger	767,288.00	6,576,893.00	374.00	12.95	-	(90.00)	7/31/2013	1
TET-13-292	Auger	767,263.00	6,576,802.00	364.00	12.00	-	(90.00)	8/1/2013	1
TET-13-293	Auger	767,313.00	6,576,893.00	371.00	14.50	-	(90.00)	8/5/2013	1
TET-13-294	Auger	767,313.00	6,576,918.00	372.00	18.00	-	(90.00)	8/6/2013	1
TET-13-295	Auger	767,313.00	6,576,943.00	368.00	14.00	-	(90.00)	8/8/2013	1
TET-13-296	Auger	767,313.00	6,576,868.00	369.00	12.80	-	(90.00)	8/9/2013	1
TET-13-297	Auger	767,450.00	6,576,843.00	363.00	8.00	-	(90.00)	8/12/2013	1
TET-13-298	Auger	767,313.00	6,576,843.00	364.00	3.95	-	(90.00)	8/12/2013	1
TET-13-299	Auger	767,263.00	6,576,827.00	371.00	4.80	-	(90.00)	8/13/2013	1
TET-13-300	Auger	767,263.00	6,576,777.00	367.00	10.00	-	(90.00)	8/13/2013	1
TET-13-301	Auger	767,150.00	6,576,825.00	371.00	12.00	-	(90.00)	8/14/2013	1
TET-13-302	Auger	767,150.00	6,576,750.00	364.00	5.50	-	(90.00)	8/15/2013	1
TET-13-303	Auger	767,050.00	6,576,650.00	367.00	9.30	-	(90.00)	8/16/2013	1
TET-13-304	Auger	767,050.00	6,576,675.00	368.00	4.50	-	(90.00)	8/16/2013	1
TET-13-305	Auger	767,054.00	6,576,725.00	371.00	15.00	-	(90.00)	8/17/2013	1
TET-13-306	Auger	767,050.00	6,576,750.00	372.00	9.00	-	(90.00)	8/19/2013	1
TET-13-307	Auger	767,500.00	6,576,943.00	361.00	7.00	-	(90.00)	8/20/2013	1
TET-13-308	Auger	767,500.00	6,576,918.00	362.00	5.00	-	(90.00)	8/21/2013	1
TET-13-309	Auger	767,500.00	6,576,993.00	359.00	9.70	-	(90.00)	8/23/2013	1
TET-13-310	Auger	767,550.00	6,576,843.00	360.00	5.30	-	(90.00)	8/26/2013	1
TET-13-311	Auger	767,550.00	6,576,868.00	360.00	6.00	-	(90.00)	8/26/2013	1
TET-13-312	Auger	767,550.00	6,576,893.00	360.00	4.00	-	(90.00)	8/27/2013	1
TET-13-313	Auger	767,548.00	6,576,918.00	362.00	5.00	-	(90.00)	8/28/2013	1
TET-13-314	Auger	766,525.00	6,576,325.00	345.00	2.50	-	(90.00)	8/29/2013	1
TET-13-315	Auger	766,527.00	6,576,300.00	340.00	2.00	-	(90.00)	8/29/2013	1
TET-13-316	Auger	766,150.00	6,576,271.00	319.00	4.00	-	(90.00)	8/29/2013	1
TET-13-317	Auger	766,148.00	6,576,247.00	311.00	3.00	-	(90.00)	8/30/2013	1
TET-13-318	Auger	766,163.00	6,576,218.00	316.00	3.00	-	(90.00)	8/30/2013	1
TET-13-319	Auger	767,650.00	6,576,918.00	343.00	3.00	-	(90.00)	8/30/2013	1
TET-13-320	Auger	767,650.00	6,576,943.00	359.00	11.00	-	(90.00)	8/31/2013	1
TET-13-321	Auger	766,525.00	6,576,225.00	347.00	5.00	-	(90.00)	9/2/2013	1
TET-13-322	Auger	766,525.00	6,576,200.00	352.00	3.00	-	(90.00)	9/2/2013	1
TET-13-323	Auger	766,342.00	6,576,023.00	328.00	4.00	-	(90.00)	9/3/2013	1
TET-13-324	Auger	766,343.00	6,575,978.00	334.00	4.00	-	(90.00)	9/3/2013	1
TET-13-325	Auger	766,343.00	6,575,934.00	337.00	5.00	-	(90.00)	9/3/2013	1
TET-13-326	Auger	767,650.00	6,576,968.00	363.00	12.00	-	(90.00)	9/4/2013	1
TET-13-327	Auger	767,650.00	6,576,993.00	363.00	8.50	-	(90.00)	9/5/2013	1
TET-13-328	Auger	767,750.00	6,576,950.00	358.00	3.00	-	(90.00)	9/5/2013	1
TET-13-329	Auger	768,362.00	6,577,298.00	341.00	1.60	-	(90.00)	9/6/2013	1
TET-13-330	Auger	768,360.00	6,577,315.00	338.00	2.00	-	(90.00)	9/6/2013	1
TET-13-331	Auger	768,376.00	6,577,297.00	348.00	2.00	-	(90.00)	9/6/2013	1
TET-13-332	Auger	768,386.00	6,577,301.00	350.00	2.80	-	(90.00)	9/6/2013	1
TET-13-333	Auger	768,405.00	6,577,303.00	351.00	2.00	-	(90.00)	9/6/2013	1
TET-13-334	Auger	768,378.00	6,577,304.00	346.00	2.00	-	(90.00)	9/9/2013	1
TET-13-335	Auger	768,381.00	6,577,318.00	342.00	2.00	-	(90.00)	9/9/2013	1
TET-13-336	Auger	768,376.00	6,577,298.00	342.00	1.65	-	(90.00)	9/9/2013	1
TET-13-337	Auger	768,387.00	6,577,296.00	341.00	2.00	-	(90.00)	9/9/2013	1
TET-13-338	Auger	768,384.00	6,577,296.00	340.00	1.00	-	(90.00)	9/9/2013	1
TET-13-339	Auger	768,350.00	6,577,300.00	332.00	4.00	-	(90.00)	9/10/2013	1
TET-13-340	Auger	768,424.00	6,577,323.00	343.00	4.40	-	(90.00)	9/10/2013	1
TET-13-341	Auger	768,436.00	6,577,329.00	342.00	2.75	-	(90.00)	9/10/2013	1
TET-13-342	Auger	768,446.00	6,577,334.00	344.00	1.70	-	(90.00)	9/11/2013	1
TET-13-343	Auger	768,471.00	6,577,373.00	341.00	3.00	-	(90.00)	9/11/2013	1

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TET-13-344	Auger	768,487.00	6,577,359.00	339.00	2.30	-	(90.00)	9/11/2013	1
TET-13-345	Auger	768,400.00	6,577,317.00	344.00	4.60	-	(90.00)	9/12/2013	1
TET-13-346	Auger	768,410.00	6,577,326.00	342.00	2.40	-	(90.00)	9/12/2013	1
TET-13-347	Auger	768,471.00	6,577,340.00	344.00	3.40	-	(90.00)	9/13/2013	1
TET-13-348	Auger	768,443.00	6,577,344.00	345.00	1.70	-	(90.00)	9/13/2013	1
TET-13-349	Auger	768,444.00	6,577,332.00	350.00	1.40	-	(90.00)	9/13/2013	1
TET-13-350	Auger	768,499.00	6,577,367.00	342.00	1.00	-	(90.00)	9/14/2013	1
TET-13-351	Auger	768,278.00	6,577,284.00	335.00	2.50	-	(90.00)	9/14/2013	1
TET-13-352	Auger	768,230.00	6,577,276.00	351.00	1.60	-	(90.00)	9/14/2013	1
TET-13-353	Auger	768,309.00	6,577,306.00	327.00	1.85	-	(90.00)	9/16/2013	1
TET-13-354	Auger	768,520.00	6,577,363.00	335.00	2.00	-	(90.00)	9/16/2013	1
TET-13-355	Auger	768,526.00	6,577,434.00	339.00	4.00	-	(90.00)	9/16/2013	1
TET-13-356	Auger	768,520.00	6,577,371.00	340.00	2.50	-	(90.00)	9/17/2013	1
TET-13-357	Auger	768,496.00	6,577,422.00	343.00	3.40	-	(90.00)	9/17/2013	1
TET-13-358	Auger	768,550.00	6,577,437.00	339.00	3.30	-	(90.00)	9/17/2013	1
TET-13-359	Auger	768,575.00	6,577,440.00	336.00	3.30	-	(90.00)	9/18/2013	1
TET-13-360	Auger	768,474.00	6,577,408.00	334.00	4.00	-	(90.00)	9/18/2013	1
TET-13-361	Auger	768,200.00	6,577,262.00	342.00	7.00	-	(90.00)	9/23/2013	1
TET-13-362	Auger	767,200.00	6,577,275.00	345.00	6.00	-	(90.00)	9/26/2013	1
TET-13-363	Auger	768,175.00	6,577,245.00	335.00	4.70	-	(90.00)	9/27/2013	1
TET-13-364	Auger	768,150.00	6,577,220.00	327.00	4.00	-	(90.00)	9/27/2013	1
TET-13-365	Auger	768,150.00	6,577,235.00	323.00	5.90	-	(90.00)	9/27/2013	1
TET-13-366	Auger	768,150.00	6,577,255.00	341.00	5.60	-	(90.00)	9/28/2013	1
TET-13-367	Auger	768,125.00	6,577,220.00	332.00	3.00	-	(90.00)	9/28/2013	1
TET-13-368	Auger	768,125.00	6,577,235.00	340.00	8.00	-	(90.00)	9/30/2013	1
TET-13-369	Auger	768,100.00	6,577,220.00	322.00	3.00	-	(90.00)	10/1/2013	1
TET-13-370	Auger	768,100.00	6,577,235.00	334.00	3.00	-	(90.00)	10/1/2013	1
TET-14-371	Auger	766,961.00	6,577,006.00	339.00	3.00	-	(90.00)	12/23/2014	1
TET-14-372	Auger	766,977.00	6,576,984.00	343.00	1.90	-	(90.00)	12/23/2014	1
TET-14-373	Auger	766,981.00	6,576,977.00	344.00	1.80	-	(90.00)	12/23/2014	1
TET-14-374	Auger	766,987.00	6,576,969.00	346.00	2.00	-	(90.00)	12/23/2014	1
TET-14-375	Auger	766,992.00	6,576,960.00	347.00	3.00	-	(90.00)	12/24/2014	1
TET-14-376	Auger	766,997.00	6,576,951.00	349.00	3.00	-	(90.00)	12/24/2014	1
TET-14-377	Auger	767,002.00	6,576,943.00	350.00	2.80	-	(90.00)	12/24/2014	1
TET-14-378	Auger	767,007.00	6,576,934.00	352.00	3.00	-	(90.00)	12/24/2014	1
TET-14-379	Auger	767,012.00	6,576,925.00	353.00	3.00	-	(90.00)	12/29/2014	1
TET-14-380	Auger	767,017.00	6,576,917.00	355.00	3.00	-	(90.00)	12/29/2014	1
TET-14-381	Auger	767,022.00	6,576,908.00	355.00	3.00	-	(90.00)	12/29/2014	1
TET-14-382	Auger	766,669.00	6,576,699.00	353.00	3.00	-	(90.00)	12/30/2014	1
TET-14-383	Auger	766,674.00	6,576,690.00	354.00	1.00	-	(90.00)	12/30/2014	1
TET-14-384	Auger	766,679.00	6,576,681.00	355.00	1.00	-	(90.00)	12/30/2014	1
TET-14-385	Auger	766,684.00	6,576,673.00	358.00	3.00	-	(90.00)	12/31/2014	1
TET-14-386	Auger	766,689.00	6,576,664.00	358.00	3.00	-	(90.00)	12/31/2014	1
TET-15-387	Auger	766,694.00	6,576,655.00	360.00	2.00	-	(90.00)	12/31/2014	1
TET-15-388	Auger	766,450.00	6,576,125.00	345.00	12.00	-	(90.00)	3/26/2015	1
TET-15-389	Auger	766,450.00	6,576,175.00	344.00	6.40	-	(90.00)	3/27/2015	1
TET-15-390	Auger	766,450.00	6,576,195.00	341.00	6.00	-	(90.00)	3/28/2015	1
TET-15-391	Auger	766,450.00	6,576,235.00	336.00	4.00	-	(90.00)	3/28/2015	1
TET-15-392	Auger	766,340.00	6,575,820.00	348.00	14.00	-	(90.00)	3/31/2015	1
TET-15-393	Auger	766,340.00	6,575,840.00	347.00	9.00	-	(90.00)	4/1/2015	1
TET-15-394	Auger	766,340.00	6,575,860.00	345.00	11.00	-	(90.00)	4/2/2015	1
TET-15-395	Auger	766,340.00	6,575,880.00	342.00	4.70	-	(90.00)	4/6/2015	1
TET-15-396	Auger	766,340.00	6,575,900.00	340.00	2.60	-	(90.00)	4/6/2015	1
TET-15-397	Auger	766,340.00	6,575,920.00	340.00	2.50	-	(90.00)	4/7/2015	1
TET-15-398	Auger	766,340.00	6,575,960.00	336.00	5.30	-	(90.00)	4/8/2015	1
TET-15-399	Auger	766,340.00	6,576,000.00	334.00	6.00	-	(90.00)	4/8/2015	1
TET-15-400	Auger	766,340.00	6,576,040.00	327.00	3.00	-	(90.00)	4/9/2015	1
TET-15-401	Auger	766,050.00	6,576,000.00	327.00	10.80	-	(90.00)	4/10/2015	1
TET-15-402	Auger	766,050.00	6,576,020.00	323.00	9.00	-	(90.00)	4/11/2015	1
TET-15-403	Auger	766,050.00	6,576,040.00	327.00	7.95	-	(90.00)	4/11/2015	1
TET-15-404	Auger	766,050.00	6,576,060.00	325.00	9.50	-	(90.00)	4/13/2015	1
TET-15-405	Auger	766,050.00	6,576,080.00	326.00	10.00	-	(90.00)	4/13/2015	1
TET-15-406	Auger	766,050.00	6,576,100.00	323.00	9.00	-	(90.00)	4/14/2015	1
TET-15-407	Auger	766,050.00	6,576,120.00	322.00	3.00	-	(90.00)	4/15/2015	1
TET-15-408	Auger	766,050.00	6,576,140.00	320.00	2.95	-	(90.00)	4/15/2015	1
TET-15-409	Auger	766,050.00	6,576,160.00	323.00	5.50	-	(90.00)	4/16/2015	1

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TET-15-410	Auger	766,050.00	6,576,180.00	323.00	4.85	-	(90.00)	4/16/2015	1
TET-15-411	Auger	766,050.00	6,576,200.00	320.00	4.40	-	(90.00)	4/17/2015	1
TET-15-412	Auger	766,050.00	6,576,220.00	317.00	4.00	-	(90.00)	4/17/2015	1
TET-15-413	Auger	766,050.00	6,576,240.00	316.00	2.40	-	(90.00)	4/21/2015	1
TET-15-414	Auger	766,050.00	6,576,260.00	313.00	2.00	-	(90.00)	4/21/2015	1
TET-15-415	Auger	766,200.00	6,576,220.00	319.00	3.00	-	(90.00)	4/23/2015	1
TET-15-416	Auger	766,200.00	6,576,240.00	319.00	6.90	-	(90.00)	4/23/2015	1
TET-15-417	Auger	766,200.00	6,576,260.00	320.00	3.00	-	(90.00)	4/24/2015	1
TET-15-418	Auger	766,200.00	6,576,280.00	320.00	4.80	-	(90.00)	4/24/2015	1
TET-15-419	Auger	766,200.00	6,576,300.00	330.00	4.30	-	(90.00)	4/25/2015	1
TET-15-420	Auger	766,200.00	6,576,320.00	317.00	6.40	-	(90.00)	4/26/2015	1
TET-15-421	Auger	766,200.00	6,576,340.00	317.00	3.70	-	(90.00)	4/27/2015	1
TET-15-422	Auger	766,200.00	6,576,360.00	315.00	2.60	-	(90.00)	4/27/2015	1
TET-15-423	Auger	766,200.00	6,576,380.00	314.00	3.50	-	(90.00)	4/27/2015	1
TET-15-424	Auger	766,200.00	6,576,400.00	312.00	3.00	-	(90.00)	4/28/2015	1
TET-15-425	Auger	766,200.00	6,576,420.00	309.00	4.00	-	(90.00)	4/28/2015	1
TET-15-426	Auger	769,454.00	6,577,841.00	311.00	5.00	-	(90.00)	4/30/2015	1
TET-15-427	Auger	767,650.00	6,577,018.00	364.00	9.40	-	(90.00)	5/13/2015	1
TET-15-428	Auger	767,650.00	6,577,043.00	360.00	3.00	-	(90.00)	5/13/2015	1
TET-15-429	Auger	767,650.00	6,577,068.00	348.00	2.90	-	(90.00)	5/14/2015	1
TET-15-430	Auger	767,643.00	6,576,893.00	352.00	9.00	-	(90.00)	5/15/2015	1
TET-15-431	Auger	767,650.00	6,576,868.00	344.00	7.00	-	(90.00)	5/18/2015	1
TET-15-432	Auger	767,750.00	6,576,975.00	348.00	8.00	-	(90.00)	5/19/2015	1
TET-15-433	Auger	767,750.00	6,577,000.00	344.00	6.00	-	(90.00)	5/21/2015	1
TET-15-434	Auger	767,750.00	6,577,025.00	349.00	4.00	-	(90.00)	5/21/2015	1
TET-15-435	Auger	767,750.00	6,577,050.00	347.00	4.80	-	(90.00)	5/28/2015	1
TET-15-436	Auger	767,750.00	6,577,075.00	346.00	8.00	-	(90.00)	5/29/2015	1
TET-15-437	Auger	767,750.00	6,577,100.00	345.00	3.30	-	(90.00)	5/29/2015	1
TET-15-438	Auger	767,750.00	6,577,125.00	344.00	7.00	-	(90.00)	6/1/2015	1
TET-15-439	Auger	767,800.00	6,577,125.00	346.00	8.50	-	(90.00)	6/2/2015	1
TET-15-440	Auger	767,800.00	6,577,100.00	350.00	2.50	-	(90.00)	6/2/2015	1
TET-15-441	Auger	767,800.00	6,577,075.00	349.00	6.60	-	(90.00)	6/3/2015	1
TET-15-442	Auger	767,800.00	6,577,050.00	348.00	8.00	-	(90.00)	6/4/2015	1
TET-15-443	Auger	767,800.00	6,577,025.00	348.00	6.70	-	(90.00)	6/12/2015	1
TET-15-444	Auger	767,896.00	6,577,125.00	350.00	6.40	-	(90.00)	6/16/2015	1
TET-15-445	Auger	767,900.00	6,577,150.00	353.00	3.00	-	(90.00)	6/16/2015	1
TET-15-446	Auger	767,900.00	6,577,175.00	348.00	2.00	-	(90.00)	6/17/2015	1
TET-15-447	Auger	768,000.00	6,577,225.00	335.00	8.90	-	(90.00)	6/18/2015	1
TET-15-448	Auger	768,000.00	6,577,140.00	322.00	2.30	-	(90.00)	6/19/2015	1
TET-15-449	Auger	768,000.00	6,577,200.00	337.00	6.95	-	(90.00)	6/19/2015	1
TET-15-450	Auger	768,000.00	6,577,180.00	325.00	1.70	-	(90.00)	6/22/2015	1
TET-15-451	Auger	768,000.00	6,577,160.00	325.00	7.00	-	(90.00)	6/23/2015	1
TET-15-452	Auger	768,000.00	6,577,170.00	325.00	3.00	-	(90.00)	6/23/2015	1
TET-15-453	Auger	768,002.00	6,577,190.00	325.00	4.40	-	(90.00)	6/23/2015	1
TET-15-454	Auger	767,850.00	6,577,090.00	339.00	2.45	-	(90.00)	6/24/2015	1
TET-15-455	Auger	767,850.00	6,577,070.00	338.00	2.90	-	(90.00)	6/24/2015	1
TET-15-456	Auger	767,850.00	6,577,050.00	338.00	2.80	-	(90.00)	6/24/2015	1
TET-15-457	Auger	767,850.00	6,577,030.00	338.00	5.00	-	(90.00)	6/25/2015	1
TET-15-458	Auger	767,850.00	6,577,010.00	338.00	1.70	-	(90.00)	6/25/2015	1
TET-15-459	Auger	767,850.00	6,576,988.29	337.00	3.80	-	(90.00)	6/25/2015	1
TET-15-460	Auger	767,950.00	6,577,060.00	329.00	5.00	-	(90.00)	6/26/2015	1
TET-15-461	Auger	767,950.00	6,577,084.00	329.00	2.20	-	(90.00)	6/29/2015	1
TET-15-462	Auger	767,950.00	6,577,100.00	333.00	3.00	-	(90.00)	6/29/2015	1
TET-15-463	Auger	767,950.00	6,577,123.00	335.00	3.00	-	(90.00)	7/1/2015	1
TET-15-464	Auger	767,950.00	6,577,140.00	337.00	6.70	-	(90.00)	7/1/2015	1
TET-15-465	Auger	767,950.00	6,577,160.00	341.00	9.00	-	(90.00)	7/2/2015	1
TET-15-466	Auger	767,900.00	6,577,105.00	340.00	2.00	-	(90.00)	7/3/2015	1
TET-15-467	Auger	767,900.00	6,577,085.00	338.00	4.80	-	(90.00)	7/3/2015	1
TET-15-468	Auger	767,900.00	6,577,065.00	333.00	3.50	-	(90.00)	7/4/2015	1
TET-15-469	Auger	767,900.00	6,577,045.00	330.00	3.00	-	(90.00)	7/4/2015	1
TET-15-470	Auger	768,050.00	6,577,156.00	326.00	3.00	-	(90.00)	7/6/2015	1
TET-15-471	Auger	768,050.00	6,577,182.00	326.00	3.00	-	(90.00)	7/6/2015	1
TET-15-472	Auger	768,050.00	6,577,202.00	325.00	3.00	-	(90.00)	7/7/2015	1
TET-15-473	Auger	768,050.00	6,577,226.00	323.00	1.50	-	(90.00)	7/7/2015	1
TET-15-474	Auger	768,050.00	6,577,242.00	325.00	3.55	-	(90.00)	7/7/2015	1
TET-15-475	Auger	767,850.00	6,577,109.00	347.00	2.45	-	(90.00)	7/9/2015	1

Appendix B

Três Estradas Drill Hole Summary									
Drill Hole ID	Type	Easting	Northing	Elevation	Depth		Dip	Completion Date	Samples
TET-15-476	Auger	767,900.00	6,577,025.00	330.00	1.60	-	(90.00)	7/9/2015	1
TET-15-477	Auger	767,900.00	6,577,005.00	333.00	4.00	-	(90.00)	7/9/2015	1
TET-15-478	Auger	767,950.00	6,577,180.00	343.00	4.80	-	(90.00)	7/10/2015	1
TET-15-479	Auger	767,950.00	6,577,200.00	341.00	4.30	-	(90.00)	7/10/2015	1
TET-15-480	Auger	767,850.00	6,577,080.00	346.00	4.00	-	(90.00)	7/14/2015	1
TET-15-481	Auger	767,850.00	6,577,060.00	344.00	3.00	-	(90.00)	7/14/2015	1
TET-15-482	Auger	767,850.00	6,577,040.00	344.00	3.40	-	(90.00)	4/14/2015	1
TET-15-483	Auger	767,850.00	6,577,020.00	344.00	2.90	-	(90.00)	7/15/2015	1
TET-15-484	Auger	767,850.00	6,577,000.00	344.00	1.75	-	(90.00)	7/15/2015	1
TET-15-485	Auger	767,850.00	6,577,100.00	350.00	8.00	-	(90.00)	7/15/2015	1
TET-15-486	Auger	767,950.00	6,577,113.00	332.00	6.00	-	(90.00)	7/16/2015	1
TET-15-487	Auger	767,950.00	6,577,132.00	337.00	4.90	-	(90.00)	7/16/2015	1