# COMPETENT PERSONS REPORT, WASTES ECOTECH SRL-CHROMIUM RECOVERY PROJECT, TÂRNĂVENI, JUDET MURES, ROMANIA

**Prepared for**
**Wastes Ecotech Srl**



**Effective Date :** **1st May 2020**

**Report Date :** **1st May 2020**

srk consulting

SRK Consulting (UK) Limited

UK7031

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|---|---|---|
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# COMPETENT PERSONS REPORT, WASTES ECOTECH SRL-CHROMIUM RECOVERY PROJECT, TÂRNĂVENI, JUDET MURES, ROMANIA

# 1 INTRODUCTION

## 1.1 Background

SRK Consulting (UK) Limited ("SRK") is an associate company of the international group holding company, SRK Consulting (Global) Limited (the "SRK Group"). SRK has been requested by Wastes Ecotech Srl ("WET", hereinafter also referred to as the "Company" or the "Client") to prepare a Competent Persons Report (CPR) on the Mineral Assets of the Company comprising two former processing waste disposal areas of the former Bicapa – Târnăveni chemical works ("Waste Storage Facility (WSF) Bicapa") located in Judet Mures, Romania.

The focus of this CPR is a review of the work done to date by the Client and several of their contractors. The CPR should be read in conjunction with the Mineral Resource Estimate (MRE) which is appended in Appendix A and summarised in Section 11. Whilst a standalone PFS report has not been prepared, the overall level of the work is deemed to be enough for a PFS level of study, this is discussed in more detail in the following sections.

## 1.2 Reporting Compliance, Reporting Standard and Reliance

### 1.2.1 Reporting compliance

SRK has been informed by the Company that this is not an Admission Document prepared for submission to a financial regulatory authority as some of the work cannot be supported by external evidence at the present time and some of the studies are still in progress, WET has indicated that it may seek to upgrade the study to enable it to report a JORC compliant Ore Reserve and/or a 43-101 compliant report at a later stage.

Notwithstanding the above, the Company has mandated SRK to prepare this CPR which is published in accordance with the appropriate Reporting Standard (defined below).

### 1.2.2 Reporting standard

*Mineral Resources and Ore Reserves*

The Reporting Standard adopted for reporting of the recent Mineral Resource Statements in this CPR is that defined by the terms and definitions given in *"The 2012 Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves as published by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia"* (the "**JORC Code**"). SRK confirms that the JORC Code has been aligned with the Committee for Mineral Reserves International Reporting Standards ("**CRIRSCO**") reporting template. Mineral Resources have not been converted to Ore Reserves at the time of reporting.

*Technical Study Standards*

SRK notes that whilst the Client has not prepared a standalone PFS document, the technical information as reported in the documents detailed above has been compared with the following definition and standard for a Pre-Feasibility Study ("**PFS**"). A Preliminary Feasibility Study (Pre-Feasibility Study) is a comprehensive study of a range of options for the technical and economic viability of a mineral project that has advanced to a stage where a preferred mining method in the case of underground mining, or the pit configuration, in the case of an open pit, is established and an effective method of mineral processing is determined. It includes a financial analysis based on reasonable assumptions on the Modifying Factors and the evaluation of any other relevant factors which are sufficient for a Competent Person, acting reasonably, to determine if all or part of the Mineral Resources may be converted to an Ore Reserve at the time of reporting. A Pre-Feasibility Study is at a lower confidence level than a Feasibility Study. (Joint Ore Reserves Committee of The Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC), 2012). In parallel to the development of the Pre-Feasibility Study (PFS) it is normally expected that an Environmental and Social Impact Study would have been completed. Typical contingencies included within the capital expenditure estimate range between 20% and 30% for a PFS evaluation and accuracy ranges are typically ±25%.

*Environmental Study Standards*

The environmental impact assessment is currently in the process of being completed, as such the environmental and social aspects which whilst they are very important for this project do not form part of this review, Section 18.5 indicates some of the permitting requirements, but this is not an in-depth review of the potential environmental impact.

### 1.2.3 Reliance on SRK

The CPR is addressed to and may be relied upon by the Directors of the Company and their Advisors as appropriate, specifically in respect of compliance with the Requirements and the Reporting Standard.

SRK declares that it has taken all reasonable care to ensure that the information contained in the CPR is, to the best of its knowledge, in accordance with the facts and contains no omission likely to affect its import.

SRK believes that its opinion must be considered as a whole and that selecting portions of the analysis or factors considered by it, without considering all factors and analyses together, could create a misleading view of the process underlying the opinions presented in this CPR. The preparation of a CPR is a complex process and does not lend itself to partial analysis or summary.

SRK has no obligation or undertaking to advise any person of any development in relation to the Mineral Assets which comes to its attention after the date of this CPR or to review, revise or update the CPR or opinion in respect of any such development occurring after the date of this CPR.

## 1.3 Work Completed

In completing this CPR SRK has conducted the following activities:

- Reviewed the work undertaken during the site visit by Emma Rudsits and Dr Matt Dey during February – March 2013 and subsequent work conducted by Dr Matt Dey from 2013 to date;
- Completed a site visit to review the extraction and processing aspects by Mr Filip Orzechowski and Mr Carl Williams respectively during November 2016;
- Due to changes in the processing circuit and the products being developed a further site visit was completed by Carl Williams during May and June 2018, these visits focussed on the review of the production of a Chrome green product;
- A second processing review visit was conducted by Dr Rob Bowell in January 2020 to review the processing aspects, the visit included a site visit to Târnăveni and to the Institutul National de Cercetare – Dezvoltare pentru Chimie si Petrochimie (ICECHIM) Bucharest;
- Compiled a summary of the 2019 PFS documents listed in Section 1.4.2 and associated outcomes;
- Conducted sufficient checks and verification exercises to ensure that it was possible to report the Mineral Resource statement in accordance with the terms and definitions of the JORC Code (defined above, Section 1.2.2) as of March 2019;
- A review of the mineral processing test work completed;
- A review and enough checks of the extraction and processing plans;
- A review of the Company's planned Work Programme including activities, schedules and expenditures for the project to PFS.

## 1.4 Limitations, Reliance on Information, Declaration, Consent and Cautionary Statements

### 1.4.1 Limitations

The Mineral Resource Statement and Technical Economic Parameters ("TEP's"), and the Technical Information rely on assumptions regarding certain forward-looking statements. These forward-looking statements are estimates and involve a number of risks and uncertainties that could cause actual results to differ materially.

The achievability of the projections of TEPs as included in this CPR and incorporated into the Life of Extraction plan ("LoEp") for the Mineral Assets are neither warranted nor guaranteed by SRK. The projections as presented and discussed herein have been proposed by WET and/or the Company's management and cannot be assured; they are necessarily based on economic assumptions, many of which are beyond the control of the Company.

Future cashflows and profits derived from such forecasts are inherently uncertain and actual results may be significantly more or less favourable.

Unless otherwise expressly stated all the opinions and conclusions expressed in this CPR are those of SRK.

While SRK has confirmed that any reported Mineral Resources fall within the relevant licence boundaries, SRK has not undertaken a legal due diligence study and cannot therefore comment upon the validity of the licences or the ownership of these.

### 1.4.2 Reliance on information

In compiling this CPR SRK has relied on the following sources of information:

- WET Excavation Plan SRK U7031 CPR Final.pdf and associated appendices, prepared by (WET, 2020).
- WET Process Planning Rev SRK U7031 CPR Final.pdf and associated appendices, prepared by WET, 2020
- Socio Economic Planning Doc Ref: WET SOECEN Plan Rev SRK U7031 CPR Final.pdf and associated appendices, prepared by WET, 2020.
- WET Technical Economic model version 47 prepared by WET. 2020

This CPR includes technical information, which requires subsequent calculations to derive subtotals, totals and weighted averages. Such calculations may involve a degree of rounding and consequently introduce an error. Where such errors occur, SRK does not consider them to be material.

### 1.4.3 Declaration

SRK will receive a fee for the preparation of this CPR in accordance with normal professional consulting practice. This fee is not contingent on the outcome of any transaction and SRK will receive no other benefit for the preparation of this report. SRK does not have any pecuniary or other interests that could reasonably be regarded as capable of affecting its ability to provide an unbiased opinion in relation to the Mineral Assets.

SRK does not have, at the date of this report, and has not ever had, any shareholding in or other relationship with the Company, its’ Advisors and consequently considers itself to be independent of the Company and its Advisors.

### 1.4.4 Consent and Copyright

This report is written to be taken in its entirety and not as excerpts. As with all CPR reports it is assumed the client will request permission to publish portions of this document into other publications prior to doing so.

### 1.4.5 Disclaimers and cautionary statements for US investors

This CPR uses the terms “Mineral Resource”, “Measured Mineral Resource”, “Indicated Mineral Resource” and “Inferred Mineral Resource”. U.S. investors and shareholders in the Company are advised that while such terms are recognised and permitted under JORC Code and the Requirements, the U.S. Securities and Exchange Commission (“SEC”) does not recognise them and strictly prohibits companies from including such terms in SEC filings.

Accordingly, U.S. investors and shareholders in the Company are cautioned not to assume that any unmodified part of the Mineral Resources in these categories will ever be converted into Ore Reserves as such term is used in this CPR.

## 1.5 Qualifications of Consultants

SRK is part of an international group (the SRK Group), which comprises some 1,400 professional staff offering expertise in a wide range of resource and engineering disciplines. The SRK Group's independence is ensured by the fact that it holds no equity in any project. This permits the SRK Group to provide its clients with conflict-free and objective recommendations on crucial judgment issues. The SRK Group has a demonstrated track record in undertaking independent assessments of resources and reserves, project evaluations and audits, CPRs and independent feasibility studies on behalf of exploration and mining companies and financial institutions worldwide. The SRK Group has also worked with many major international mining companies and their projects, providing mining industry consultancy service inputs.

This CPR has been prepared by a team of consultants sourced from the SRK Group's office in the UK over a three-month period.

**Table 1-1: Team Members**

| Responsible Discipline | Consultant | Designation | Registration, Membership, Qualifications | Years' Experience |
|---|---|---|---|---|
| Project Director, Process Chemistry | Dr Rob Bowell | Corporate | Eur.Geol. C.Chem C.Geol PhD FIMMM | 33 |
| Project Manager | Carl Williams | Principal | C.WEM CEng MSc | 17 |
| Geology Mineral Resources | Martin Pittuck | Corporate | MIMMM CEng FGS CGeol MSc | 30 |
| | Dr John Arthur | Associate | CGeol PhD | 30 |
| Geotechnical Engineering | Richard Martindale | Principal | MIMMM CEng FGS MSc | 20 |
| Mining | Filip Orzechowski | Senior | CEng MIMMM MSc | 15 |
| Infrastructure | Colin Chapman | Principal | CEng MIMMM MSc | 20 |
| Environmental | John Merry | Principal | MPhil | 30 |
| Financial Model | Inge Moors | Principal | MAusIMM, MSc | 12 |

# 2 RELIANCE ON OTHER EXPERTS

WET provided SRK with written summaries of the asset and descriptions of the jurisdiction which SRK has relied on and modified to some extent in discussion with the WET management team. The descriptions provided herein are dependent upon technical, financial and legal input from the Company. Notably, the technical information as provided to, and taken in good faith by SRK. SRK has not undertaken a legal review of the Project.

The resource statement was prepared by Dr John Arthur C.Geol PhD. Parts of the Mineral Processing and Excavation sections were prepared by Matt Dey - C.Eng, PhD, MIMMM on behalf of WET as an Independent Engineer and reviewed by SRK.

# 3 LOCATION AND OWNERSHIP

The project is located to the south west of the town of Târnăveni, in the county of Judet Mures, in Transylvania, Romania.

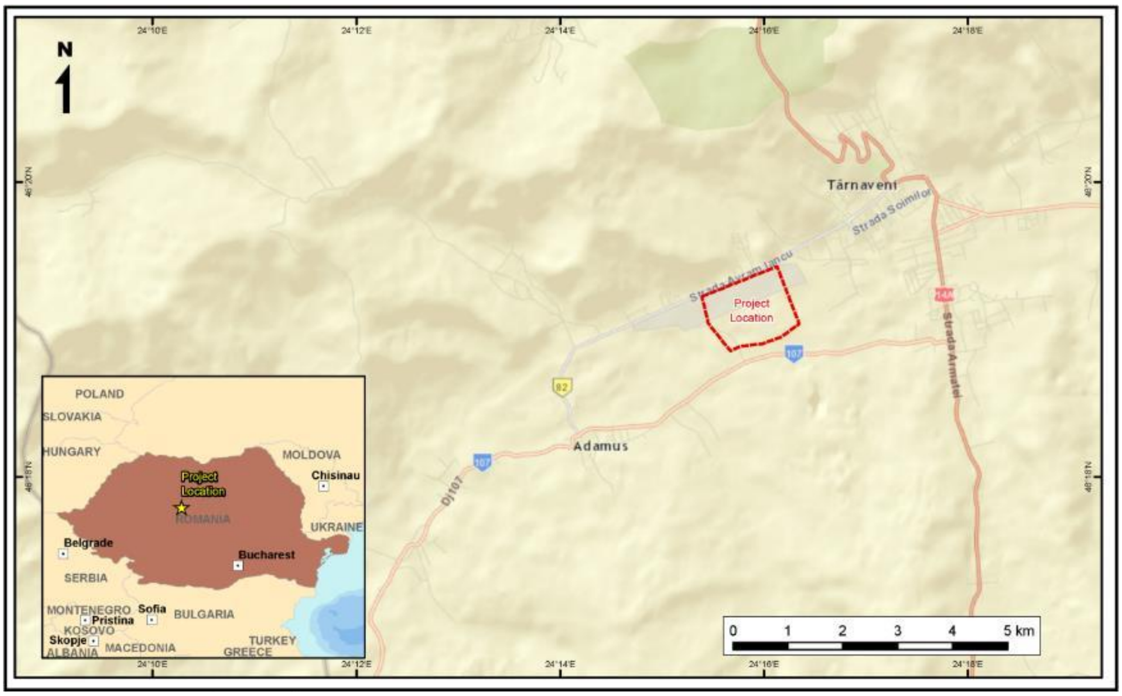



**Figure 3-1: Location of the Project**

The project comprises two Waste Storage Facilities (WSF 2&3) as the feed material and a proportion of an additional WSF 1 (40%) which is not subject of the reprocessing exercise owing to its inert form at the former Bicapa – Târnăveni chemical works. The former Bicapa site processed chromite material to create a sodium dichromate product.

SRK understands that all chromite processed through the factory was transported via railway from chromite mines in Kazakhstan. In the production of sodium dichromate from chromite ore sodium carbonate (calcined soda) is added with the ore together with a local dolomite added to stabilise the production process. Once blended, all feed stocks then calcined in excess of 1,100 C. This process oxidises the chromium ore into the chromium VI product and thermally degrades the dolomite into an oxide of calcium and magnesium. The dolomite came from nearby Sfantu Gheorghe and is naturally elevated in magnesium; it was also transported by railway. The WSF is therefore comprised of the waste materials and associated by-products from the production of sodium dichromate.

The WSF was originally constructed on an historical floodplain; however, prior to the WSF construction, engineering and control of the river mitigated the effects of further flooding. The base of the WSF is composed of a 6 m deep slurry perimeter retaining wall (along the southern boundary) with two N-S dividing slurry walls within the enclosure. The base is comprised of the natural sediment layer of the floodplain, covered by fines muds and clays, although the exact depth has not been accurately determined. A natural, greater than 1.5-metre clay layer has been confirmed in the cores from two boreholes, plus a greater than one metre clay layer has been confirmed along the length of a 400m long trench excavated by WET to the east of the WSF. Although yet to be confirmed it is assumed that this natural clay layer underlies the rest of the facility. SRK understands that this layer was utilised to create an impermeable layer between the wastes and other natural sediments to prevent leaching of waste solutions.

The site of the former Bicapa Chemical works is now owned by several different parties, WET owns a portion of the previous waste storage Nr 1 facility and adjacent areas that are the proposed locations for the processing plant and other ancillary building, access routes and dam area.

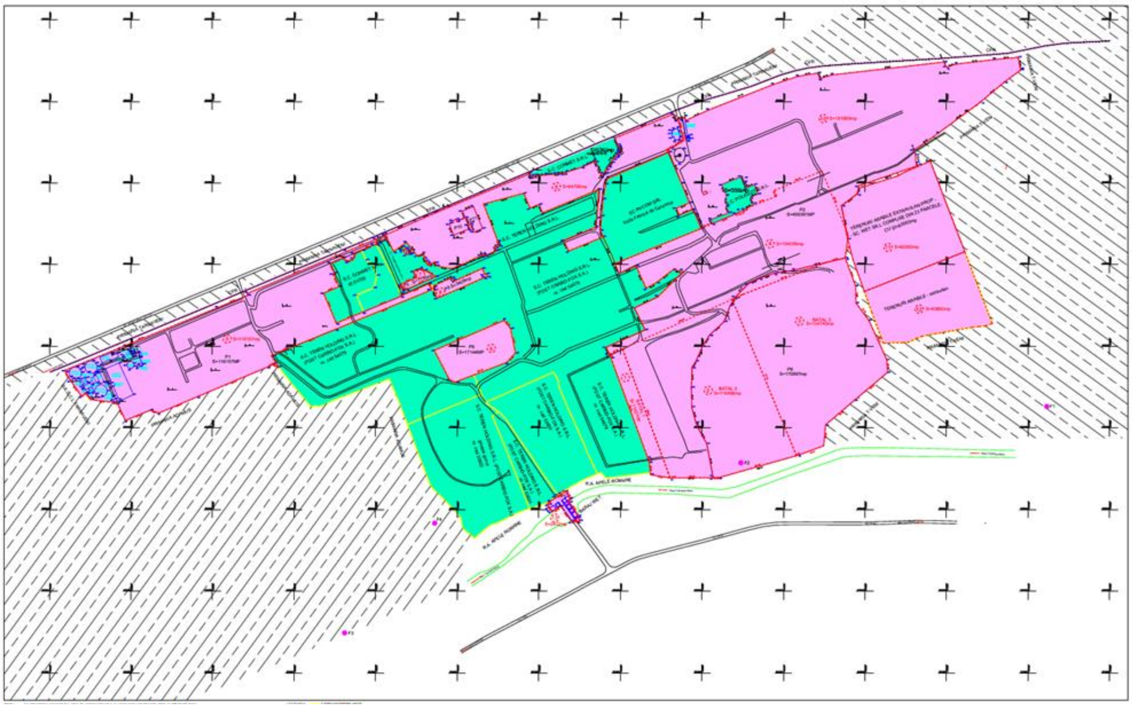


**Figure 3-2: Plan of the ownership of the site (WET owns the pink sections) (provided by WET, 2019)**

WET acquired the remaining sections of the former Bicapa site in a public auction on the 16th February 2012 as part of an asset sale by the officially appointed Liquidator. The WET bid was officially accepted by the liquidator on February 27, 2012 and takeover of the assets occurred between 15th April and 10th May 2012, according to the Asset Takeover Protocol. The total land plot acquired amounts to 848,218.50 $m^2$ and comprised of over 120 individual plots on the main titles (now consolidated into 8 plots) and a further 17 smaller plots making up what was to be WSF 4 (bought by the then Bicapa in the late 80's / early 90's) from various private individuals. The land is wholly owned and registered to Wastes Ecotech Srl. Details of the site ownership can be found in Appendix 2 of the WET Excavation Plan (WET, 2020), this has not been legally reviewed by SRK.

## 3.1 Risks and Opportunities

WET has the possibility within their permits to reinstate the flood alleviation dam downstream of the Chrome Oxide Process Residue (COPR) WSF and operate the structure according to instructions from the relevant regulators. The dam has dual use in regulating the river flow for flood protection as well as regulating the flow for water supply to the future plant. WET has the responsibility to repair / reinstate and operate the dam and is required to make adjustments to the flow through the dam as requested by the ABA Mures authority if and when asked. WET can independently adjust flow to assure sufficient water capture for its operation within parameters to be established at the time the dam is put back into operation. The dam is required to be operated in conjunction with the Târnăveni water supply dam approx. 5 km upstream.

A number of the permits provided to SRK for review have expired and are in the process of being renewed. SRK has received correspondence from WET demonstrating this.

# 4 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES AND INFRASTRUCTRE

As the site was a former major chemical works it is easily accessible and can be accessed directly from the national road DN 14A, running immediately to the north of the site. From there, there is approximately 90 km of secondary roads before reaching Sebes and the major highway. This will reduce to 64 km when the highway connecting Cluj and the main East-West highway across Romania is completed, within the next 12 months. This highway goes on to connect with the trans-European major road network and in Arad, western Romania, a major European logistics provider runs daily private trains to the Port of Antwerp. The connection between central Transylvania and the port of Constanta, in southern Romania, on the Black Sea, is currently, poorly serviced in terms of the road infrastructure.

Between the road and the site runs the secondary railway line Nr 307 connecting the cities of Blaj, Târnăveni and Praid. Ultimately, this connects through to the national and trans-European rail network. There is an existing siding in front of the site.

Târnăveni has a humid continental climate, with temperatures ranging between 12°C and 26°C in summer to between -6°C and 2°C in winter. Rainfall is typically low with an average of 6 to 10 days per month of precipitation.

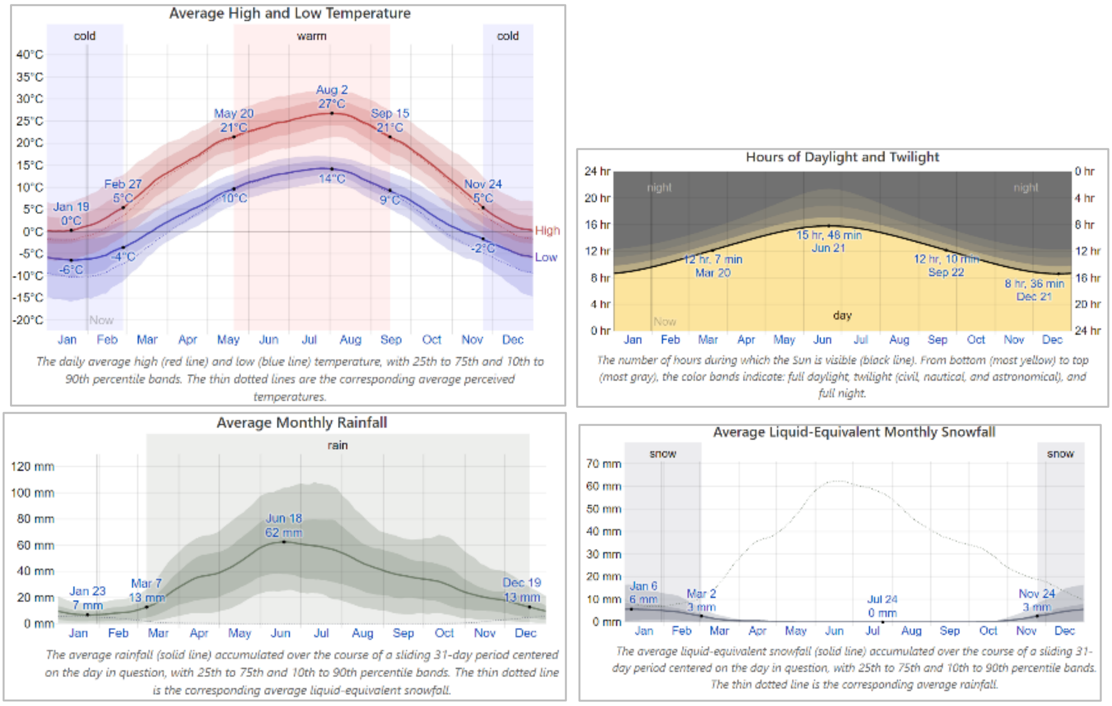



**Figure 4-1: Climate data (Ref https://weatherspark.com/y/91137/Average-Weather-in-T%C3%A2rn%C4%83veni-Romania-Year-Round, accessed 30 Jan 2020)**

The local town of Târnăveni has relatively high unemployment, in the order of 5 to 10%, since the former chemical works closed no major employer has replaced the jobs lost. WET has indicated that they would look to recruit some of these former employees to fulfil some of the staffing requirements for the proposed project and there is plenty of local accommodation for those recruited from outside of the local area. A full socioeconomic study and social impact study has not been completed for the project.

# 5 HISTORY

The former Bicapa chemical works was first established as a nitrogen producing unit in 1916 and during the nearly 90 years of operations has had a varied number of chemical production operations and bullion refining on the site. These operations included two sodium dichromate production facilities, with an associated purpose-built waste storage facility. At its peak the site employed some 6,500 personnel, primarily from the Târnăveni City area.

The BiCapa Chemical Combinat site is a former state-owned processing facility which opened in 1916 and produced a number of products until 2001 when it was closed.

- 1916 to 1922 - production of gases and explosives;
- 1922 to 1948 - manufacture of nitrates and fertilisers including carbide, calcium cyanide, caustic soda, calcium chloride and ceramics production;
- 1939 to 1948 - processing of gold, silver, copper and lead;
- 1950 to 1955 - building of the factory for production of Sodium Dichromate;
- 1954 - production of ceramics commenced (anti acid, tiles and other ceramics);
- 1968 to 1986 – installation and production of zinc oxides, barium salts, formic acid, hydrofluoric acid, Creolite, Freon 11+12;
- 1971 to 1975 – building of the Dichromate 2 plant, redirection of the river to provide additional space, building of a new river dam facility and building 3 storage “pits” on site (2 solely for Dichromate waste & 1 for Carbide type waste);
- 2001 - site closure; and;
- 2012 - BiCapa privatisation completed via public tender.

Between 1955 and 2001 sodium dichromate was the primary product which was produced. All chromite processed through the factory was transported via railway from chromite mines in Kazakhstan. The sodium dichromate was produced with local dolomite, brought in from Sfantu Gheorghe by rail cars, to stabilise the production process. Sfantu Gheorghe is located in Covasna County, Transylvania, approximately 190 km south-west of Târnăveni.

All waste products produced by the sodium dichromate factories between 1970 and 2001 were stored within WSF 2 &3 (approximately 590x370 m), at an average thickness of 12 m.

Historically a number of chemical / industrial processing units were placed in the Mures / Sibiu / Cluj counties due to the large natural gas fields that occur there. Romania’s natural gas company (RomGaz) is based in Medias (18 km) and Targu Mures (35 km) and has an extensive gas collection and distribution network running throughout the county.

The reprocessing of the sodium dichromate production waste is not a new concept, it was studied in detail under the communist government, and new processing equipment was proposed and approved in 1989. Unfortunately, this opportunity was never realised as a revolution within Romania led to a change in government and funding for the project was removed.

Sodium dichromate production stopped on the site in 2001 and the site, as a whole, closed in 2004. WET then acquired portions of the site, through a liquidator’s auction, in February 2012.

# 6 ASSET DESCRIPTION

The project site encompasses 84.8 ha of the former Bicapa chemical works. Most of the site is now just concrete hard stands, as the former works building have now been levelled, due to their fragile state. Most of this land will be cleared, reclaimed and be made available for sale. However, there is chromite ore processing residue (COPR) held in an 18.7 ha waste storage facility (WSF) that is of key interest, which along with an additional circa 10.3 ha of the future re-processing facility and associated facilities that will be inside the coffer dam / flood protection zone.

The COPR contains an estimated 1,920,000 dry metric tonnes of waste generated by the former production of the sodium dichromate salts, in two purpose-built waste storage cells. This material has an indicated resource of 5.01% w/w $Cr_2O_3$ equivalents (3.5% w/w Cr), together with 24.07% w/w MgO equivalents (14.5% w/w Mg) and 23.34% CaO equivalents (16.7% w/w Ca).

The waste storage facility is relatively barren, with minimal plant growth (restricted to the outer slopes) and no evidence of secondary waste disposal. The Company has stated that the parts of the waste storage facility covered by this project are solely owned by WET.

# 7 DRILLING AND SAMPLING

## 7.1 Introduction

The WSF measures approximately 590 x 370 m, with an average vertical thickness of 12 m, although the surface of the WSF is uneven. Information regarding the method of disposal and dumping of the waste products is limited, and SRK understands there was no systematic method of dumping. Subsequently the drill programme was designed to spatially cover the WSF with an even drill hole spacing.

## 7.2 Drilling

WET employed Geotesting Studii Si Investigii Geotechnice si Geofizice drilling and geotechnical services (“Geotesting”) to oversee the drilling of the WSF. Geotesting operate to Eurocode Standards and specialise in geotechnical work.

Two different drill rigs (Figure 7-1) were employed, a:

- A core rig CMV MK 600F which had a diameter of 101 mm; and
- A truck mounted hollow stem auger rig with a diameter of 63 mm

Geotesting supplied two geologists per drill rig to undertake the sampling, logging and drill rig supervision. The Company also employed a geologist who had overall responsibility for the project. The Company geologist supervised and checked all work conducted by Geotesting.

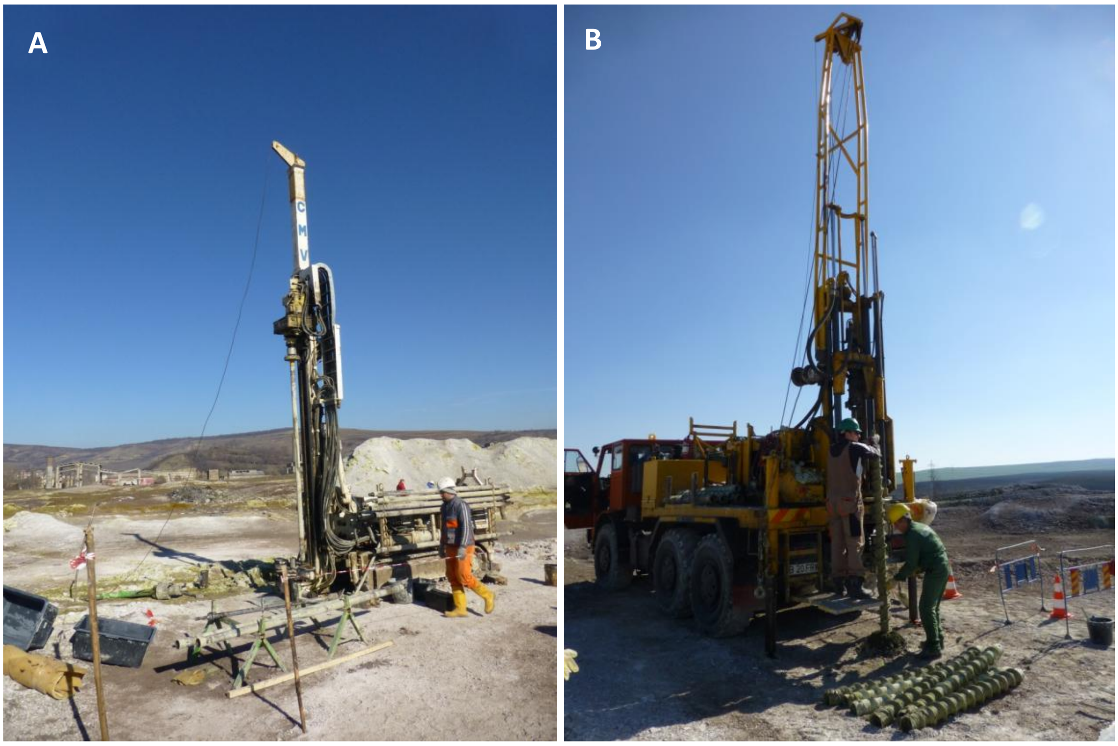



**Figure 7-1: A) CMV MK 600F Coring rig, B) Truck mounted hollow stem auger rig**

### 7.2.1 Data spacing

A grid of 50x50 m was designed to cover the extent of the WSF and extrapolated onto the top surface (Figure 7-2).

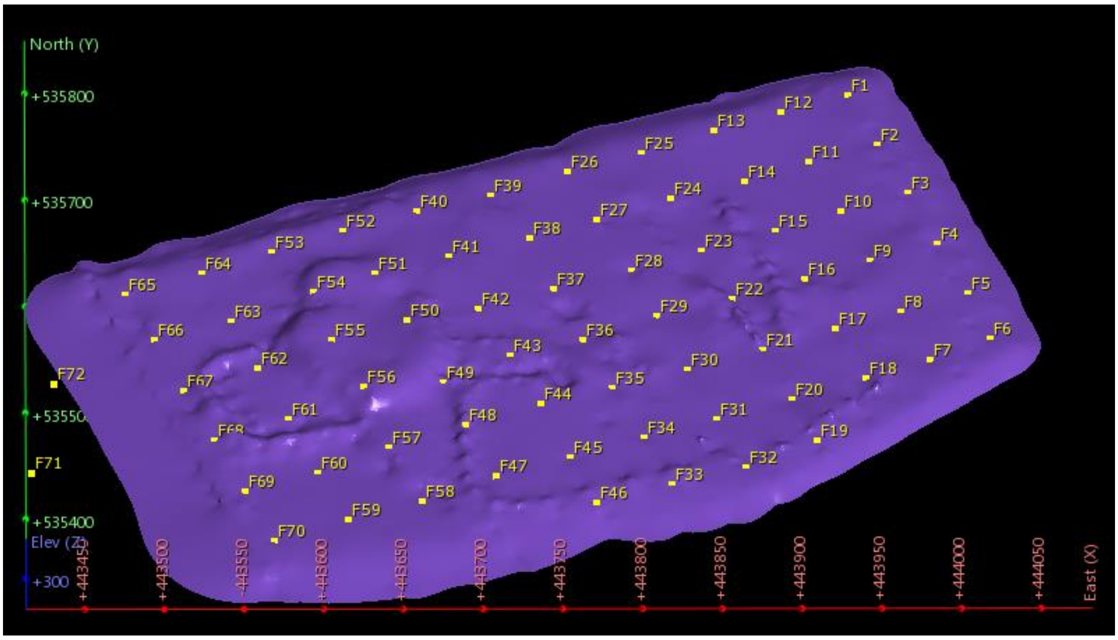



**Figure 7-2: Final modelled WSF top surface, drill hole collars shown as yellow (viewed looking north)**

A total of 72 drill holes totalling 861.75 m (Table 7-1) were drilled. All drill holes were completed vertically.

**Table 7-1: Drill hole collar co-ordinates**

| BHID | Easting | Northing | RL | Total Depth | BHID | Easting | Northing | RL | Total Depth |
|---|---|---|---|---|---|---|---|---|---|
| F1 | 443929 | 535780 | 289.5 | 10 | F37 | 443744 | 535598 | 289.3 | 10.8 |
| F2 | 443948 | 535734 | 289.6 | 12 | F38 | 443730 | 535646 | 289.3 | 10 |
| F3 | 443967 | 535688 | 289.9 | 12 | F39 | 443705 | 535689 | 287.3 | 9 |
| F4 | 443985 | 535641 | 288.9 | 10.5 | F40 | 443659 | 535671 | 289.7 | 12.5 |
| F5 | 444004 | 535594 | 289.0 | 9.55 | F41 | 443679 | 535626 | 292.1 | 17.5 |
| F6 | 444019 | 535552 | 288.5 | 8.3 | F42 | 443697 | 535577 | 291.5 | 16 |
| F7 | 443981 | 535532 | 288.6 | 8.5 | F43 | 443717 | 535533 | 292.5 | 17 |
| F8 | 443963 | 535577 | 289.0 | 13 | F44 | 443737 | 535488 | 291.6 | 15 |
| F9 | 443943 | 535625 | 289.0 | 11.5 | F45 | 443755 | 535440 | 289.8 | 15 |
| F10 | 443925 | 535671 | 289.2 | 11 | F46 | 443771 | 535396 | 290.4 | 10 |
| F11 | 443905 | 535718 | 288.9 | 10 | F47 | 443708 | 535421 | 290.5 | 16 |
| F12 | 443888 | 535764 | 289.5 | 10 | F48 | 443690 | 535467 | 292.6 | 17 |
| F13 | 443846 | 535746 | 289.6 | 11.5 | F49 | 443675 | 535507 | 293.1 | 17 |
| F14 | 443865 | 535700 | 288.3 | 11 | F50 | 443652 | 535560 | 296.9 | 22 |
| F15 | 443884 | 535654 | 288.9 | 10.5 | F51 | 443633 | 535606 | 295.8 | 19 |
| F16 | 443902 | 535607 | 288.8 | 12.6 | F52 | 443613 | 535653 | 289.9 | 14.5 |
| F17 | 443921 | 535561 | 288.7 | 10 | F53 | 443568 | 535634 | 288.8 | 13 |
| F18 | 443940 | 535515 | 288.4 | 8.5 | F54 | 443594 | 535589 | 296.1 | 16 |
| F19 | 443910 | 535455 | 289.8 | 9.5 | F55 | 443606 | 535541 | 297.7 | 21 |
| F20 | 443894 | 535496 | 287.7 | 10 | F56 | 443626 | 535495 | 299.2 | 23.5 |
| F21 | 443876 | 535542 | 288.4 | 10 | F57 | 443641 | 535447 | 291.7 | 16 |
| F22 | 443856 | 535588 | 290.0 | 13 | F58 | 443662 | 535402 | 286.5 | 11 |
| F23 | 443837 | 535635 | 288.8 | 11.2 | F59 | 443615 | 535384 | 287.1 | 12 |
| F24 | 443818 | 535683 | 289.3 | 14.5 | F60 | 443597 | 535430 | 286.1 | 10 |
| F25 | 443800 | 535727 | 288.7 | 11.5 | F61 | 443578 | 535477 | 289.1 | 12 |
| F26 | 443754 | 535709 | 288.5 | 10 | F62 | 443559 | 535523 | 290.0 | 12 |
| F27 | 443772 | 535662 | 290.1 | 12.2 | F63 | 443542 | 535569 | 289.3 | 8.5 |
| F28 | 443794 | 535617 | 288.8 | 11 | F64 | 443524 | 535614 | 289.4 | 9 |
| F29 | 443810 | 535574 | 288.7 | 11 | F65 | 443476 | 535596 | 287.7 | 7 |
| F30 | 443828 | 535523 | 288.8 | 11.5 | F66 | 443494 | 535552 | 288.6 | 8 |
| F31 | 443847 | 535477 | 288.3 | 10 | F67 | 443513 | 535504 | 288.3 | 7 |
| F32 | 443865 | 535431 | 289.4 | 10 | F68 | 443532 | 535458 | 288.5 | 10 |
| F33 | 443819 | 535415 | 289.5 | 10.5 | F69 | 443551 | 535411 | 286.8 | 8.6 |
| F34 | 443801 | 535459 | 289.2 | 12.5 | F70 | 443569 | 535365 | 286.8 | 8 |
| F35 | 443781 | 535505 | 289.8 | 13 | F71 | 443417 | 535432 | 284.5 | 7 |
| F36 | 443763 | 535550 | 289.3 | 12 | F72 | 443432 | 535515 | 285.2 | 10 |

### 7.2.2 Collar surveys

A GPS total station was used to locate the position of all drill holes prior to drilling. Once drilling was completed the GPS total station was also used to pick up the final drill hole collar locations. The collar co-ordinates were provided to SRK in Microsoft Excel format and are in Romanian co-ordinate system Stereographic70 Datum Pulkovo 1942.

All completed drill holes have been covered with concrete and the collar location marked with a wooden stake, the drill hole ID is written on the stake in permanent marker, and red and white danger tape is attached to the stake (Figure 7-3).


**Figure 7-3: Completed drill hole collar marked and labelled**

### 7.2.3 Downhole surveys

All drill holes were drilled vertical, no downhole surveys were undertaken as the drill holes were of sufficiently short length (typically less than 25 m) that significant deviation of the drill holes from the vertical was not expected.

### 7.2.4 Logging

Lithological logging was undertaken by Geotesting geologists on paper logs in the field. All logs were checked by the Company geologist. The logging included recording the material type, colour, and grain size (clay, silt, and sand were used as grain size indicators). The lithological logs were entered into Microsoft Excel and provided to SRK in that format.

## 7.3 Sampling

### 7.3.1 Introduction

The sampling methods differed depending on the drill rig (coring versus auger), and have therefore been explained in Section 7.3.2 and Section 7.3.3 below.

All sampling was undertaken by Geotesting geologists and was checked by the Company geologist. Where any confusion or inaccuracies occurred, the holes were re-drilled and re-sampled.

Where samples contained a considerable amount of moisture the sample was mixed to a homogeneous consistency and an even proportion (depending on sample size of 1/8 or 1/4) was sampled.  The Company geologist reported that this did not frequently occur.

Umpire laboratory samples were taken concurrently with primary samples.

### 7.3.2 Coring Rig sampling

Core drilling was undertaken using 1 m drill rods. Sampling was undertaken (where appropriate) at 1 m intervals with the aim of collecting approximately 700 g of material per metre. Samples were homogenised (where possible) or sampled using trowels and knives.

Typically sampling 1/8 of the core was sufficient to produce the required sample weight, and where this was insufficient, 1/4 of the core was sampled.

All samples were extruded from the drill rods into plastic tubs, where the samples were photographed with the Date, Sample ID, BHID, From and To depths listed on a board. To ensure no contamination could occur the plastic tubs, rubber mat, and all sampling tools were washed between samples. A mop and cloth were used to clean the rubber mat, the cleaning water was changed frequently, and all other items rinsed regularly.

Where samples were competent, they were cut into quarters then eights of which one was sampled. Where samples could be homogenised, the following process was undertaken:

Romanian Ring Sample Method (Figure 7-4):

1) 1 m sample is tipped onto a rubber mat;
2) The sample flattened in a corkscrew manner;
3) A ring is made in the middle by scooping material onto the outer circle;
4) The sample is placed back into the plastic tub and homogenised again;
5) The sample is tipped back on to the mat and the process above repeated;
6) The sample was then flattened and cut into quarters, two opposing quarters were extracted and placed in a crush reject bag;

Steps 1 to 6 are repeated, with the two opposing quarters placed in a sample bag, and the remainder being added to the crush reject bag. If the requisite sample size cannot be produced only steps 1 to 6 would be completed.

Once collected, samples were weighed, wrapped in plastic wrap and secured with adhesive tape. This system was similar to that used for disturbed geotechnical sampling (Eurocode Standard 7). An adhesive sample tag filled out by the sampler was attached to the sample; information recorded includes sample number, sample date, name and signature of the sampler.

Sample numbers correspond to a pre-determined list produced in Microsoft Excel which also details which sample numbers should be given to Certified Reference Material (“CRMs”) and field duplicate samples. The sample weight, sample interval (From and To depths), and BHID were recorded next to the appropriate sample number. The duplicate sample number is also noted on the sample and drill sheet and on the crush reject bags.


**Figure 7-4: Core sampling method A) Sample flattened using corkscrew method; B) A ring is made; C) Sample is flattened and cut into quarters**

### 7.3.3 Auger Rig sampling

Hollow-stem Auger drilling was conducted using 1.5 m drill rods; two drill rods are used at a time so 3 m of material is made available for sampling. The split sets are placed on the ground and one half of the split sets removed.

The hollow-stem auger core is split in half using a trowel; the half core in the split set was photographed with a sign detailing Date, Sample number, BHID, From and To depths. The core in the split sets was then quartered (a 1/8 sample is not taken as the core has a smaller diameter, Figure 7-5). The core does not come in contact with the ground and thus there is little or no chance for contamination to occur. No homogenising is undertaken as a representative sample is acquired using the method explained above. The splits were cleaned with water and a cloth between runs to eliminate any contamination.

Once collected samples were weighed, wrapped in plastic wrap, and secured with adhesive tape. An adhesive sample tag filled out by the sampler was attached on which sample number, sample date, name and signature of the sampler were recorded.

Sample numbers correspond to a pre-determined list produced in Microsoft Excel which also details which sample numbers should be given to Certified Reference Material ("CRMs") and field duplicate samples. The sample weight, sample interval (From and To depths), and drill hole identification number were recorded next to the appropriate sample number. The duplicate sample number was also noted on the sample and drill sheet and on the crush reject bags.


**Figure 7-5: Auger sampling method, A) Half core sampling; B) Half core sample**

### 7.3.4 Sample Recovery

Core recovery was measured differently depending on the drill rig type. Measurements of core recovery on the coring drill rig were taken prior to core being extruded from the core tube, and the core from the auger rig was measured after removal of a half round split set. The core recoveries were typically in excess of 80% and in most cases 100%. Where low core recoveries were encountered, they are thought to relate to water lenses and/or soft oversaturated mud. In some cases, void spaces were also encountered within the drilling, these appear to be due to uneven settling, or subsequent drying of the tailings over time.

## 7.4 Sample Security and Storage

All samples were collected by the company geologists at the end of each day and the, samples stored securely at the gate house office. The only people with access to the core storage are the Company geologist, Company director, and Company security guard.

Once the drill programme was completed, all samples were packed into wooden crates under the supervision of the Company geologists and transported overland to ACME Analytical Laboratory Krakow, Poland for sample preparation. Once sample preparation was completed the samples were sent to ACME Analytical Laboratory ("ACME") in Vancouver.

All crushed reject is kept in plastic bags which have been securely fastened; these are stored in a secure room at the gate house office. The crush reject bags are labelled with BHID, Sample number, From and To depths, Date, Weight, and the samplers name and signature.

## 7.5 Sample Preparation

Sample preparation was undertaken at ACME Analytical Laboratory Krakow, Poland. Samples were initially dried at 60°C for 12 hours however the samples were found to still contain moisture after this time and therefore the temperature and drying time were increased to 110°C for 16 to 20 hours. Once the drying process was complete the samples were crushed until 80% passed 10 mesh (2000 µm). This was then split down to 250 g which was pulverised to 85% passing 200 mesh (74 µm).

## 7.6 Laboratory Analysis

The Company employed ACME Analytical Laboratory (“ACME”) in Vancouver as the main analytical laboratory, and ALS Chemex Laboratory (“ALS”) in Vancouver as the Umpire laboratory. The samples were analysed using a lithium borate fusion with an X-Ray Fluorescence (“XRF”) finish analytical method. All elemental results are reported as oxides, regardless of actual composition. A total of 862 samples were submitted for analysis at ACME and a total of 48 samples were submitted to ALS umpire laboratory. The lithium borate XRF method had an upper detection limit of 10% $Cr_2O_3$, therefore any samples which contained greater than 10% $Cr_2O_3$ would not be released from the waste matrix fully and therefore did not fully fuse with the lithium borate. This occurred for 28 samples. Where this occurred, samples were diluted to enable complete fusion with the lithium borate solution. Samples were then re-analysed such that the $Cr_2O_3$ could be appropriately determined. The limited analytical range of 0 to 10% for the XRF method used meant that the high-grade Cr CRM (GCR-05) was useful only in determining how effective the dilution and re-analysis method was.

## 7.7 Verifications by SRK

### 7.7.1 Site Visit

Employees of SRK (at the time) conducted a visit to the site between the dates of the 27th February and 1st March 2013. Emma Rudsits (Senior Consultant, Mining Geology) and Matt Dey (Principal Consultant, Geochemical Engineering) attended the visit, and reviewed the assay drilling programme, sampling procedures and discussed the previous use of the site with Bicapa-Târnăveni employees. During the visit SRK verified the quality of the geological and sampling information.

The assay drilling rigs were found to be in good condition and following industry best practice with regards to sampling. The assay drill programme, logging, and sampling were supervised by the company geologist and followed industry best practice.

## 7.8 SRK Comments

SRK has reviewed the sampling procedures during the February-March 2013 site visit for the Project and is satisfied that industry best practices have been followed. It is SRK’s view that the data is adequate for the reporting of a Mineral Resource estimate.

# 8 DATA QUALITY

SRK has completed a number of checks on the raw data which was collected by the Company during the 2013 drilling programme, which comprises 72 core and hollow-stem auger holes, for a total of 861 m which were drilled using industry best practices and sampled using appropriate methodologies. The drill holes were drilled on an approximately 50 x 50 m grid, which covered the extent of the WSF.

A GPS total station was used to locate the position of all drill holes prior to drilling. Once drilling was completed the GPS total station was also used to pick up the final drill hole collar locations. A topographic survey of the WSF was also provided by the Company.

SRK conducted checks which included reviewing the Quality Assurance and Quality Control (“QAQC”) programme, and the density data. These checks indicate that the QAQC procedures in place have been successful in ensuring that the assay data collected is of good quality.

## 8.1 QAQC Procedures

SRK undertook an analysis of the QAQC data provided by the Company which included Certified Reference Material ("CRMs"), field duplicates and a comparison of umpire laboratory data. The Company employed ACME Analytical Laboratory ("ACME") in Vancouver as the main analytical laboratory, and ALS Chemex Laboratory ("ALS") in Vancouver as the Umpire laboratory. Table 8-1 summarises the number of CRMs and field duplicates submitted to ACME.

**Table 8-1: Company Submitted QAQC Samples**

| Type | Total Number | Insertion Rate (%) | Laboratory |
|---|---|---|---|
| CRM | 72 | 8.4% | ACME |
| Field Duplicates | 49 | 6% | ACME |
| Umpire Duplicates | 48 | 6% | ALS |

## 8.2 SRK QAQC Analysis

### 8.2.1 Certified Reference Material ("CRMs")

Three different CRMs were submitted with samples from the 2013 drilling programme, these are summarised in Table 8-2. All three standards were obtained from Geostats Pty Ltd. SRK has completed an analysis of the performance of all three CRMs, with respect to the key elements (chromium, calcium, and magnesium, all these elements are reported as the respective oxides of the elements as a default). Table 8-3 summarises the key elements and their expected mean values. The three CRMs cover ranges of grades for the three elements. However, it should be noted that the grade ranges of the elements in the CRMs are not particularly representative of the typical grades in the deposit samples; SRK notes that the CRM selection list is limited with regards to this point. CRM GMN-04 has a similar value for CaO. However, MgO, and $Cr_2O_3$ are poorly represented in terms of grade ranges. SRK recommends using CRMs which are closer to the average value of each of the three elements, and which provide a better range of grades for each of the three elements.

However, if such CRMs are not commercially available then the umpire laboratory checks will need to provide assurance for the grades from the primary laboratory to be used in any future higher confidence resource estimate.

**Table 8-2: Company Submitted CRMs**

| Reference Sample | Total Number | Insertion Rate (%) | Laboratory |
|---|---|---|---|
| GCR-03 | 25 | 2.9% | ACME |
| GCR-05 | 24 | 2.8% | ACME |
| GMN-04 | 23 | 2.7% | ACME |
| Total CRMs | | 8.4% | |

**Table 8-3: Summary of CRMs used and their expected values**

| Reference Sample | Expected Value (Cr2O3 %) | Std Dev | Expected Value (CaO %) | Std Dev | Expected Value (MgO %) | Std Dev |
|---|---|---|---|---|---|---|
| GCR-03 | 1.05 | 0.02 | 0.039 | 0.019 | 36.25 | 0.13 |
| GCR-05 | 38.04 | 0.34 | 0.039 | 0.016 | 13.21 | 0.15 |
| GMN-04* | 0.0018 | - | 19.520 | 0.20 | 13.27 | 0.20 |

*Note:
GMN-04 is certified for Cr no standard deviation has been provided

*$Cr_2O_3$ Analysis*

Figure 8-1 and Figure 8-2 show the performance of $Cr_2O_3$ for CRMs GCR-03 and GCR-05.

The performance of GCR-03 (Figure 8-1) shows the majority of the results are within 2 standard deviations of the expected mean, which indicates that, the results for the $Cr_2O_3$ within the low grade ranges are suitable for use in a Mineral Resource estimate.

The performance of GCR-05 (Figure 8-2) is poor, with the majority of the samples falling outside of three standard deviations of the expected mean value. The results of GCR-05 indicate there may be a bias associated with the higher grade $Cr_2O_3$ results. Potentially this could result in an over estimation of $Cr_2O_3$ in this grade range by approximately 5% (relative)

GMN-04 has not been reviewed as the CRM is not certified for $Cr_2O_3$, and the level of Cr present in the CRM is typically below the detection limit of the analytically method.

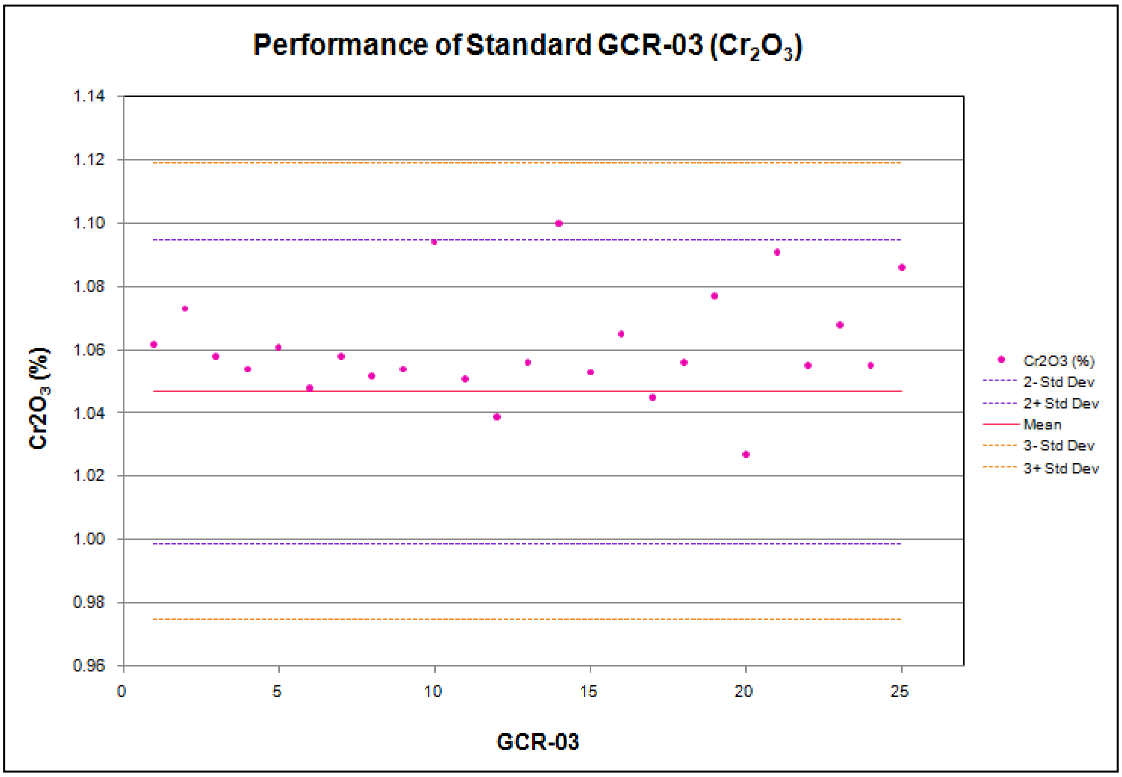



**Figure 8-1: Performance of $Cr_2O_3$ % in GCR-03**

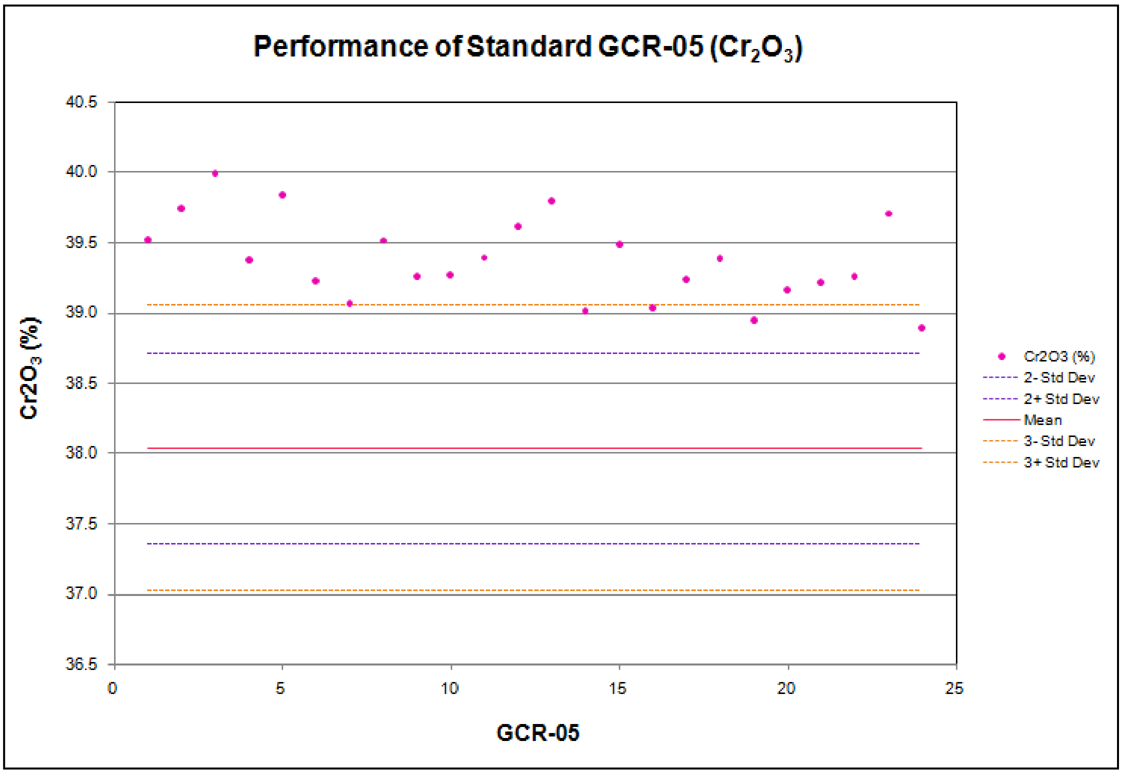



**Figure 8-2: Performance of $Cr_2O_3$ % in GCR-05**

*MgO Analysis*

Figure 8-3, Figure 8-4 and Figure 8-5 show the performance of MgO for CRMs GCR-03, GCR-05 and GMN-04.

The performance of MgO in GCR-03 (Figure 8-3) demonstrates slight inaccuracy in the selected grade range with all samples reporting greater than three standard deviations. This could be due to poor calibration of equipment prior to analysis. The grade bias may result in a slight (roughly 2% relative) over estimation of MgO for the deposit samples in this grade range.

The performance of MgO in GCR-05 (Figure 8-4) also displays the grade bias (approximately 1%) seen in GCR-03. The majority of the samples fall outside three standard deviations. SRK notes that for GMN-04 (Figure 8-5) all standards report within two standard deviations, but again display a higher-grade bias.

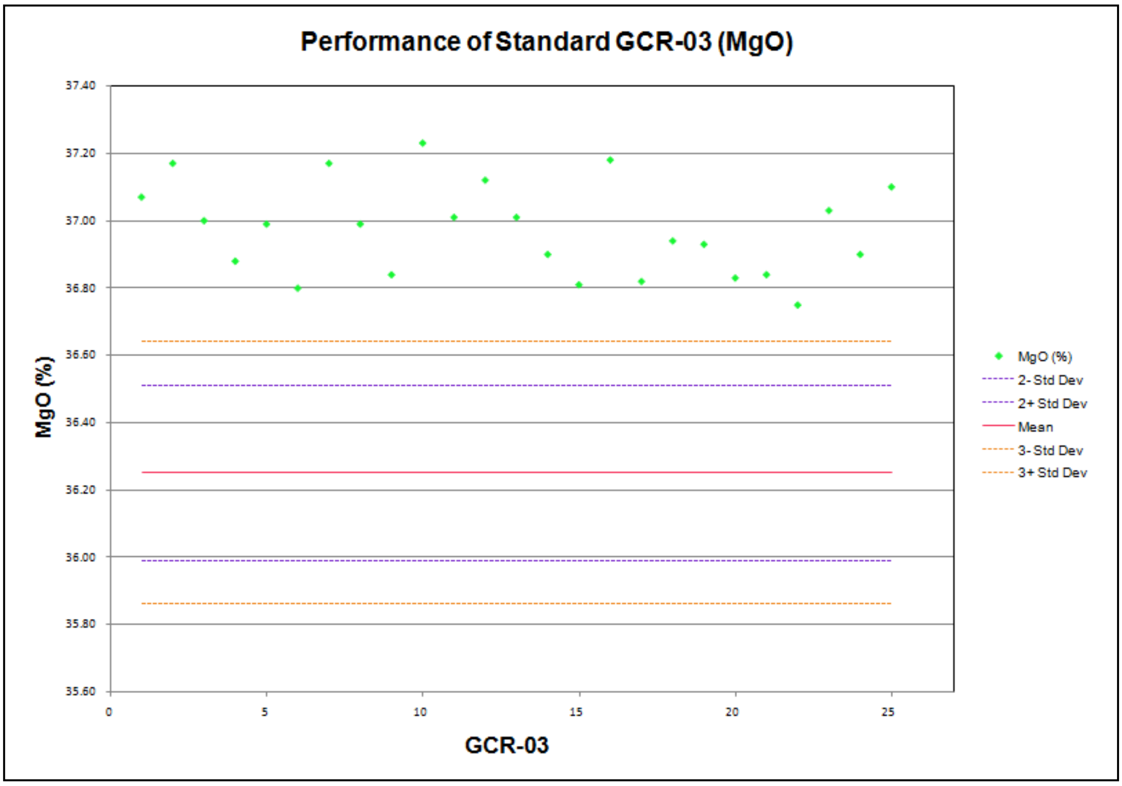



**Figure 8-3: Performance of MgO % in GCR-03**

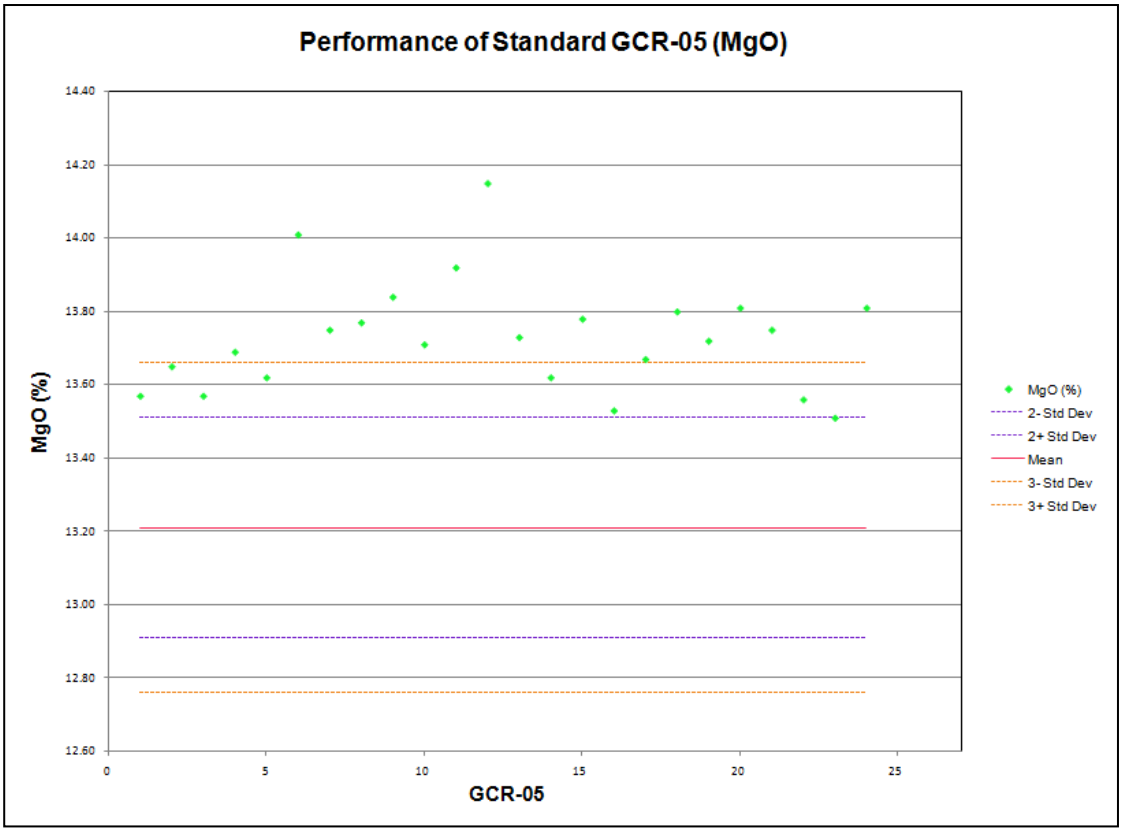



**Figure 8-4: Performance of MgO % in GCR-05**

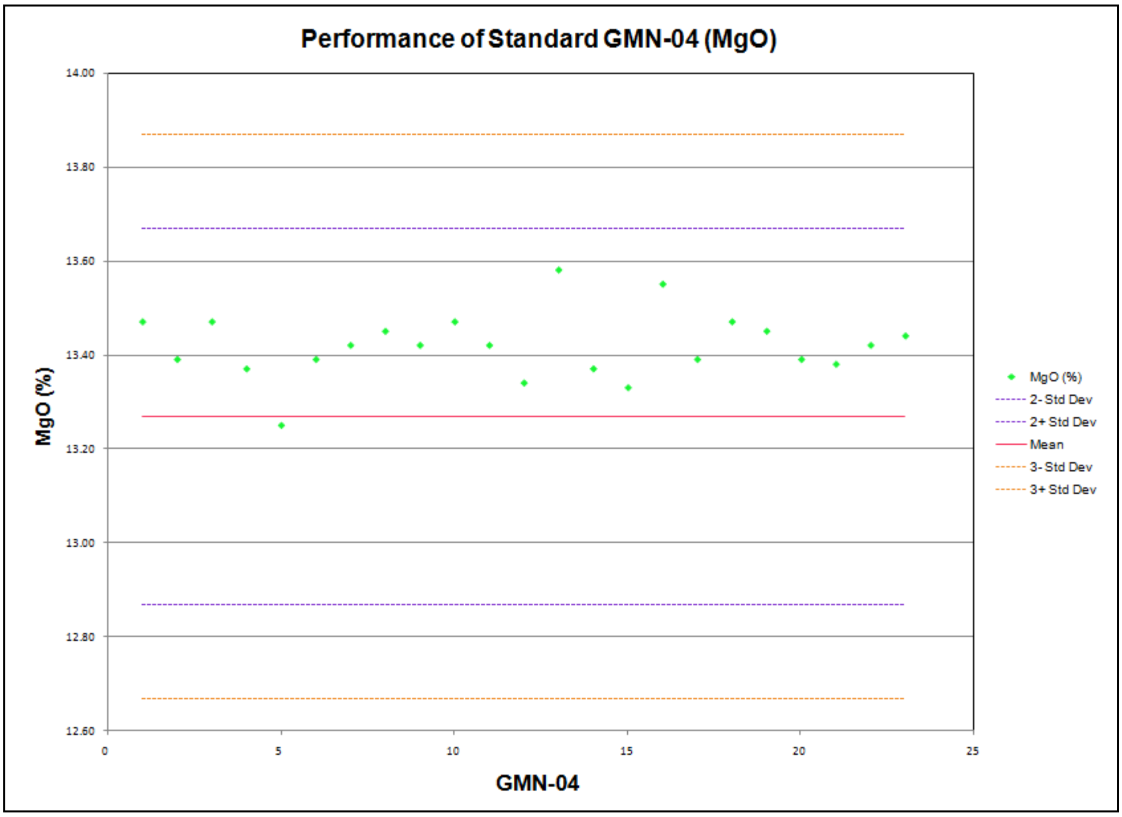



**Figure 8-5: Performance of MgO % in GMN-04**

*CaO Analysis*

Figure 8-6, Figure 8-7 and Figure 8-8 show the performance of CaO for CRMs GCR-03, GCR-05 and GMN-04. The results for all three CRMs are typically within two standard deviations of the expected mean, which indicates that, the results for the CaO within these grade ranges is suitable for use in a Mineral Resource estimate.

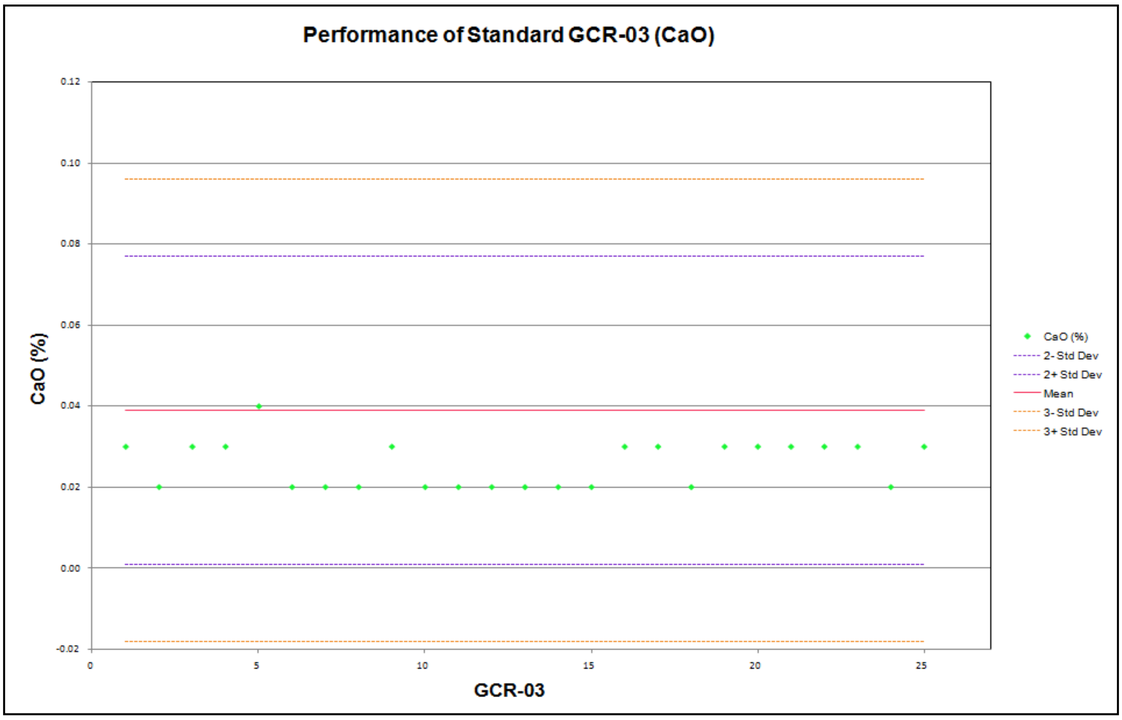



**Figure 8-6: Performance of CaO % in GCR-03**

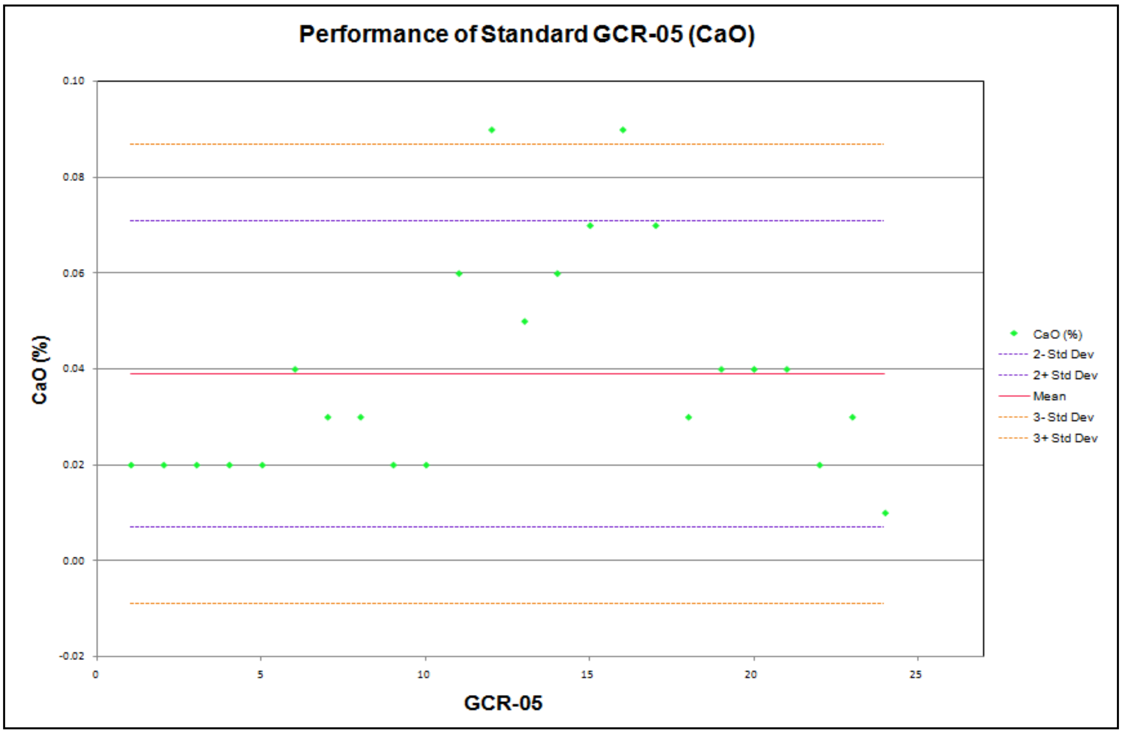



**Figure 8-7: Performance of CaO % in GCR-05**

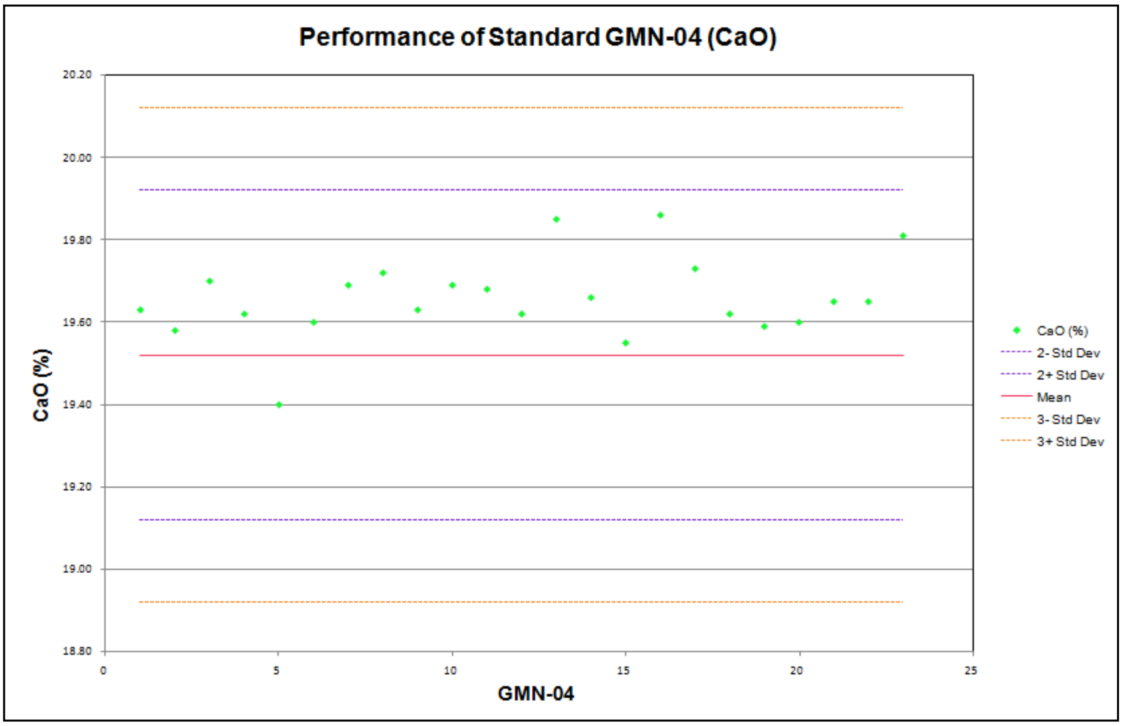



**Figure 8-8: Performance of CaO % in GMN-04**

*Summary Company CRMs*

The results of the QAQC analysis indicate that the performance of the three different oxides for the three CRMs (GCR-03, GCR-05, and GMN-04) was variable, with a slight high-grade bias noted for a number of the elements. SRK accepts that overall the results are suitable for use in a Mineral Resource estimate; however, there is concern that there may be an over estimation of grades in some grade ranges for $Cr_2O_3$ and MgO. $Cr_2O_3$ reports in the order of 1.5% higher in the 38% grade range and MgO reports in the order of 0.75% higher in the 36.2% and 13.2% grade ranges. The over estimation may be due to the dilution method employed to ensure that $Cr_2O_3$ at greater than 10% was brought into the analytical range.

## 8.3 Duplicates

### 8.3.1 Company Submitted Field Duplicates

In total 49 field duplicate samples were submitted; this was approximately 6% of the total number of samples submitted (Table 8-4). SRK notes that the percentage of field duplicates submitted is sufficient to demonstrate the homogeneity of the material within each sample.

**Table 8-4: Company submitted Field Duplicate samples**

| Reference Sample | Total Number | Insertion Rate (%) | Laboratory |
|---|---|---|---|
| Field Duplicates | 49 | 6% | ACME |

*Field Duplicate Analysis and Summary*

The field duplicate samples submitted for analysis show a strong correlation between the parent and duplicate samples for all of the key elements ($Cr_2O_3$, MgO, and CaO, Figure 8-9 Figure 8-10 and Figure 8-11 respectively), with correlation co-efficient typically greater than 0.91. In SRK's opinion the results of the field duplicate analysis are acceptable and show repeatability of the analysis, indicating that representative sampling is being undertaken in the field.

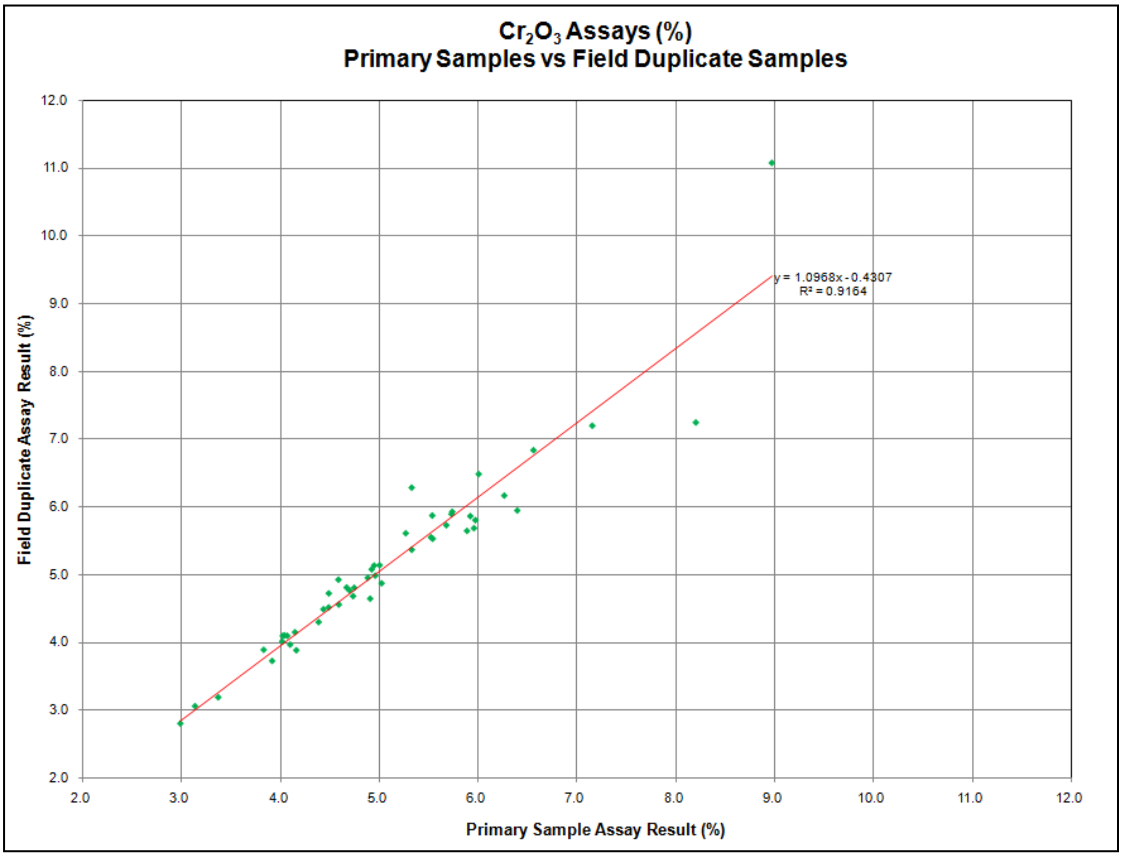



**Figure 8-9: Field duplicate performance $Cr_2O_3$**

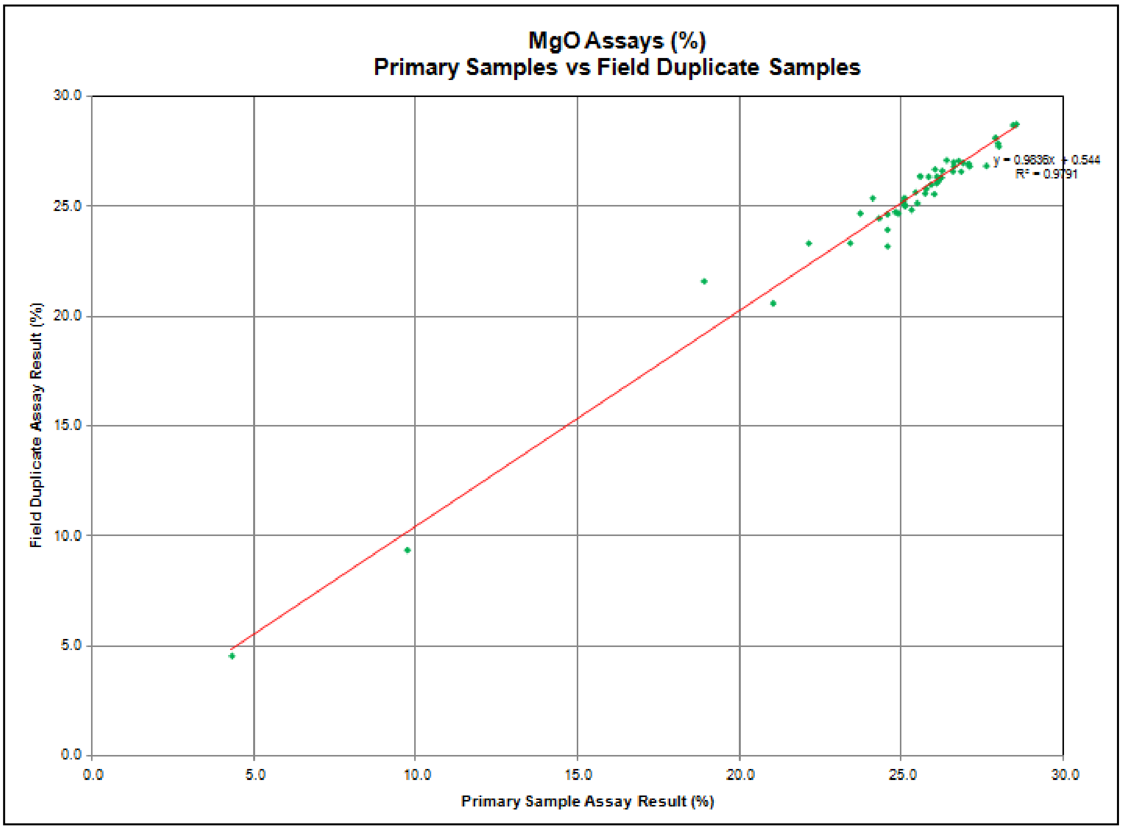



**Figure 8-10: Field duplicate performance MgO**

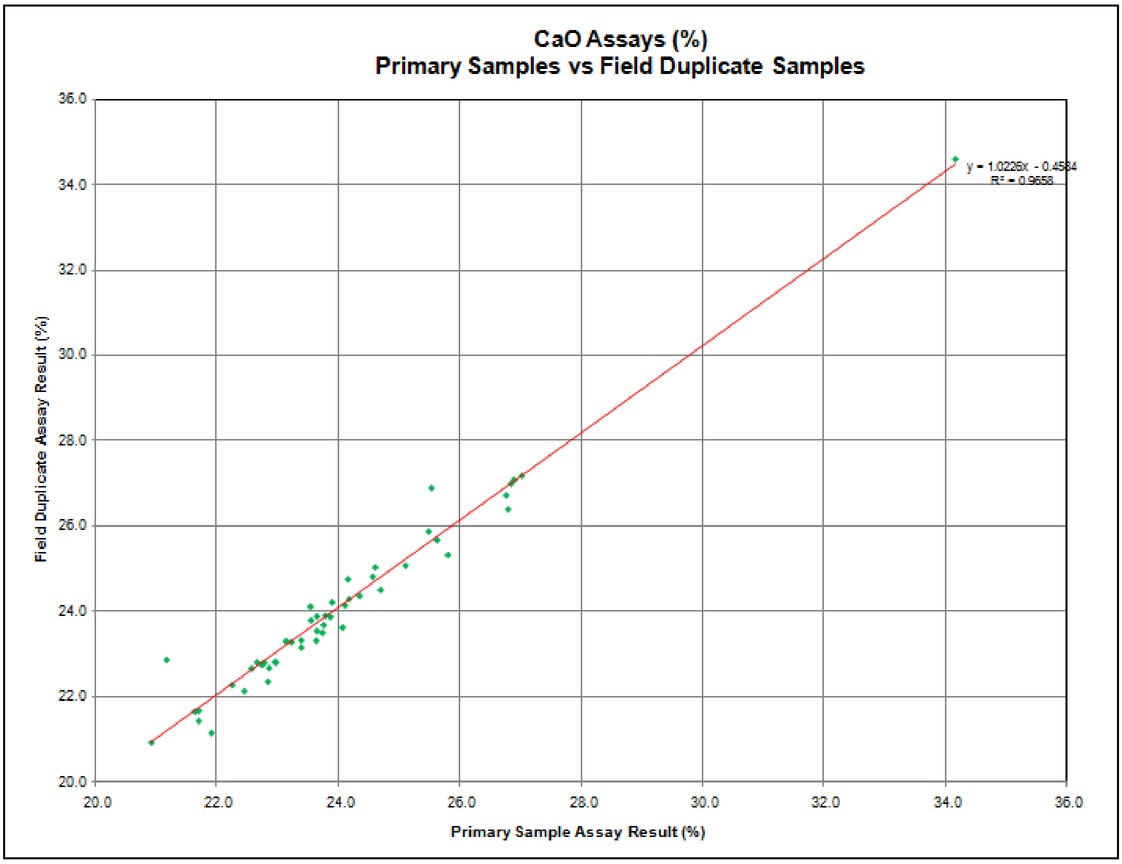



**Figure 8-11: Field duplicate performance CaO**

## 8.4 External Laboratory Checks

The Company utilised ALS Chemex Laboratory ("ALS") in Vancouver as the Umpire laboratory. The Company submitted 48 duplicate samples, and three CRMs with this analysis, totalling 6% of the total number of samples. SRK considers this a sufficient amount to verify the analytical work conducted by the primary laboratory, ACME. Figure 8-12, Figure 8-13 and Figure 8-14 show the results of the comparison of duplicate samples sent to ACME and ALS laboratories for the key elements. In all three ($Cr_2O_3$, MgO, and CaO) cases the two laboratories show excellent correlations. In SRKs opinion the excellent correlation between laboratories indicates a suitable analysis method, and that the primary results received from ACME are robust and fit for use in a Mineral Resource estimate.

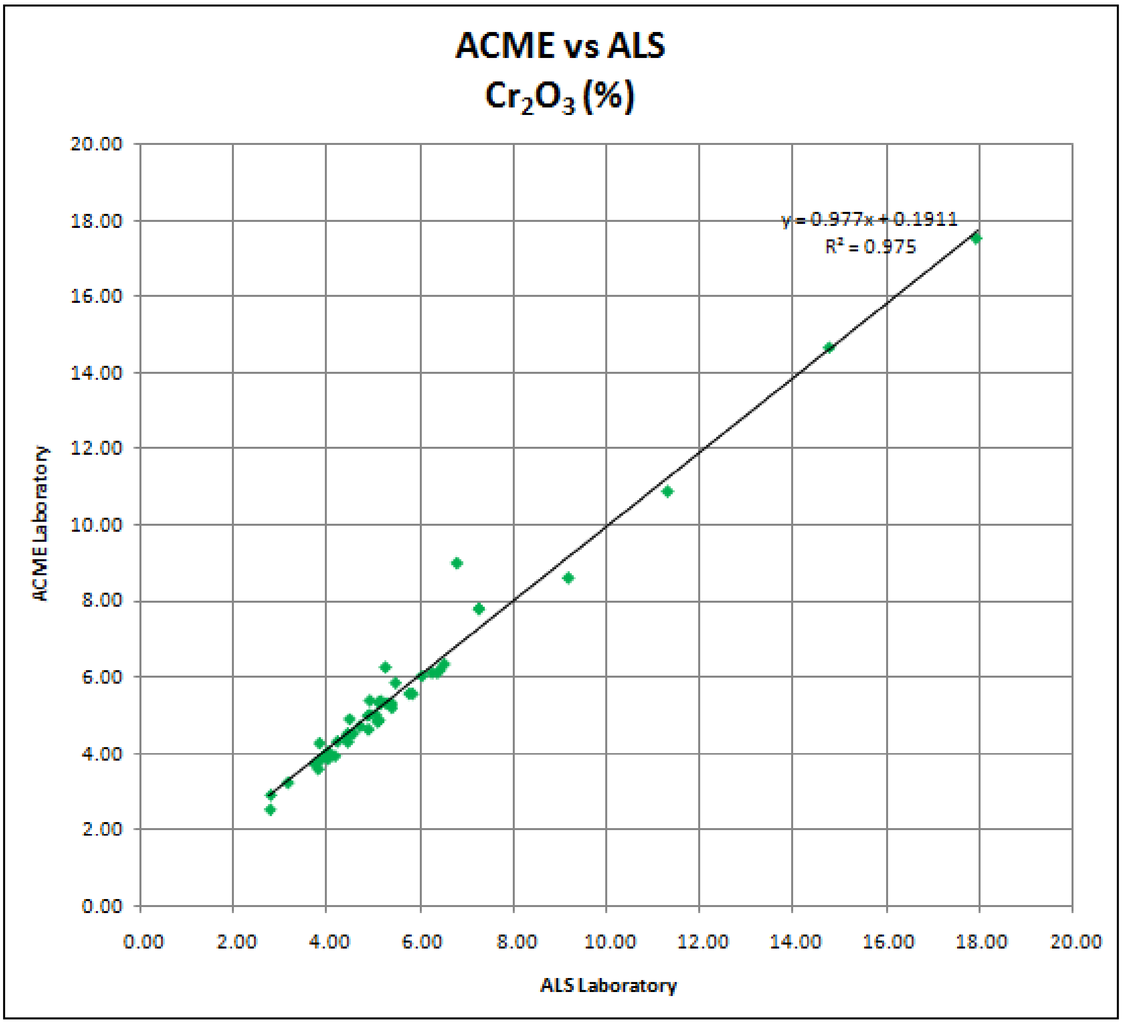



**Figure 8-12: Comparison of duplicate samples sent to ACME and ALS laboratories**

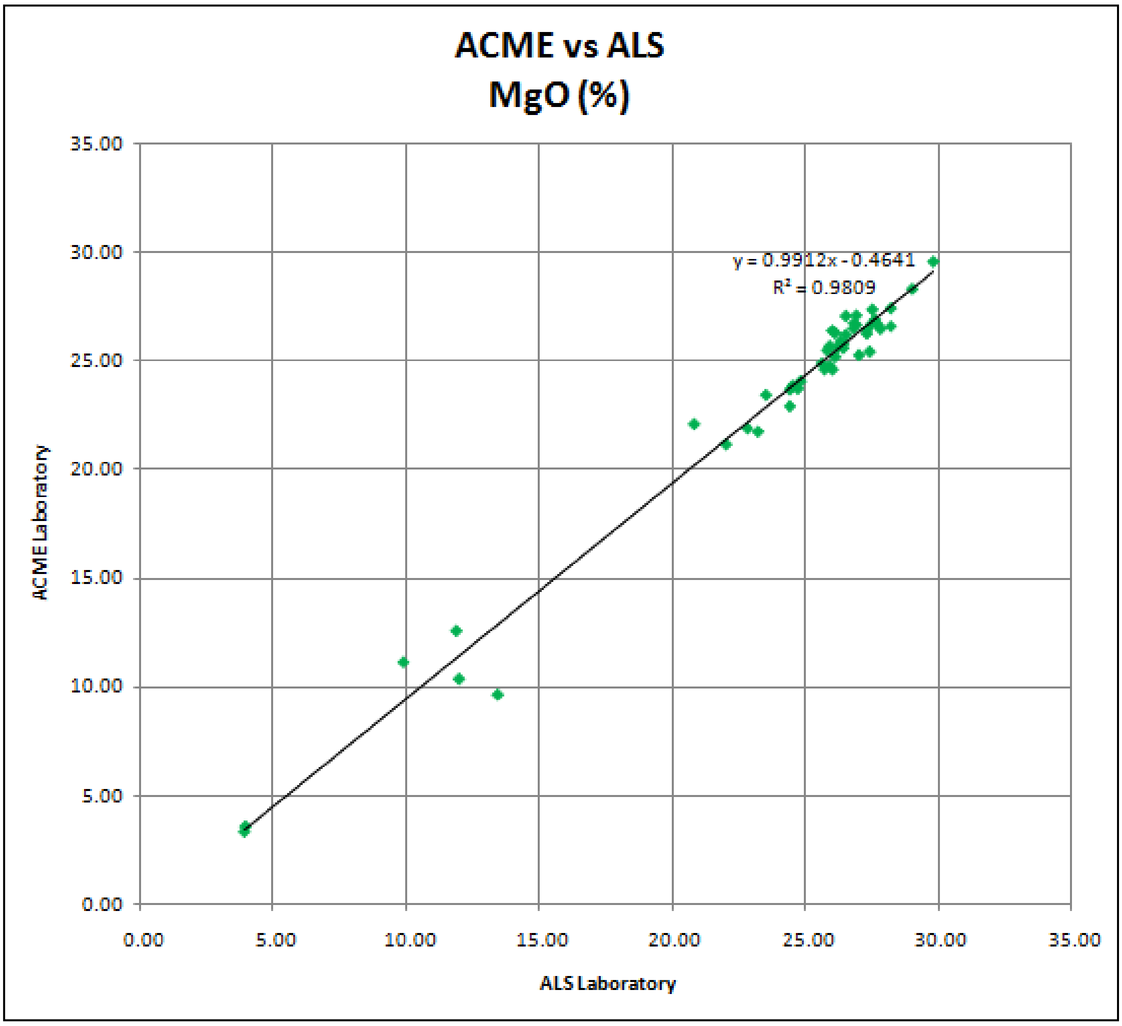



**Figure 8-13: Comparison of duplicate samples sent to ACME and ALS laboratories**

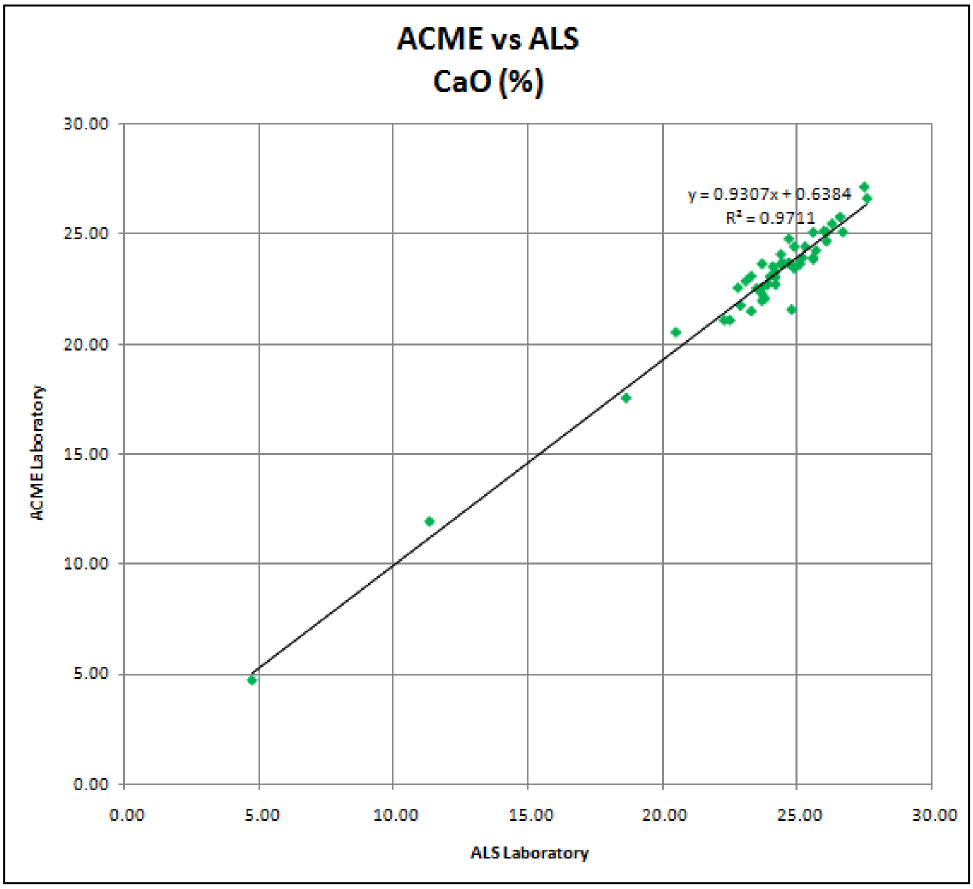



**Figure 8-14: Comparison of duplicate samples sent to ACME and ALS laboratories**

## 8.5 SRK Comments QAQC

SRK accepts that overall the results are suitable for use in a Mineral Resource estimate; however, there is concern that there may be a slight over estimation of grades for $Cr_2O_3$ and MgO.

The field duplicate samples submitted to ACME show a strong correlation to the original sample, for all three oxides, thus SRK is confident in the repeatability of the sample preparation and analysis of these samples.

The comparison of duplicate samples sent to both ACME and ALS indicates a strong correlation for all three oxides, SRK is confident that analysis method employed is suitable and fit for use in a Mineral Resource estimate.

## 8.6 Density Calculations

SRK notes that the initial density sampling was undertaken using industry best practices, however the subsequent laboratory test work was not of a suitable quality for the resulting wet and dry densities to be used in the estimation process. The issues recorded from the original density sampling are:

- The number of samples is low (74);
- The distribution of density holes is not regular across the site with only 8 holes drilled
- Density calculations assume a constant 100% recovery of the drill samples;
- The humidity values show values well in excess of 100% implying a problem with either the sample collection or the analysis.

To update the density information SRK re-estimated the block density values using the data from the resource drilling to ensure the wet and dry densities were correctly represented. The advantage of this data set is that the number of samples increased from 74 to 1076 and the distribution of the samples covered the complete area of the WSF on a regular grid. SRK considers that the subsequent density test work is suitable for estimating and reporting tonnes in a Mineral Resource estimate.

Due to the variable nature of the density distributions with obvious multiple populations it was decided that simply applying a mean value to the deposit as a whole would be inappropriate. Density was thus interpolated using an inverse distance interpolation into individual blocks in an effort to mimic the variable distribution of values recorded in the drill samples.

The resulting block variation in estimated density reflects the known process and deposition activity across the site providing confidence that the updated dry density model is appropriate for reporting of Mineral Resources.

# 9 GEOLOGICAL MODELLING AND INTERPRETATION

The "geological" model on which the Mineral Resource statement is made is based on the grades of $Cr_2O_3$, MgO and CaO as sampled from the drilling of the WSF carried out in 2013. Although it is possible to define areas within the WSF where relatively higher and lower grades of the various products occur, the nature of the deposition as a slurry in shallow ponds and deltaic "beaches" gives rise to a series of very shallow (vertically thin) sequences which overlap and transgress. This makes it difficult to model individual domains within the WSF at a scale which would be appropriate for estimating separately, especially given the spacing of 50m between sample locations. As a result, the WSF is treated as a single domain for the purpose of the Resource estimation exercise described herein. The domain boundaries therefore consist of the upper and lower topographic surfaces and the linear bunds which enclose the site.

The historical nature of the WSF and lack of detailed pre-dumping information means no pre-dumping surfaces could be located. The WSF was placed on an historical floodplain, which is comprised of a natural sediment layer, covered by (an assumed) 100 cms of mud and clay. SRK understands the purpose of this clay layer was to create an impermeable layer between the WSF and natural sediment to prevent leaching of solutions. The mud and clay layer has a distinctive brown colour, whereas the chromite wastes have a distinctive green basal layer, the logged boundary between the green and brown layers (Figure 13-2) was used to define the base of the WSF. Therefore prior to modelling the base of the WSF the data was manipulated in Microsoft excel to ensure the base was correctly defined based on the green/brown colour distinctions. In some cases, leaching appears to have occurred down into the mud and clay layer, where this has occurred, and assay results indicate a significant presence of chromium SRK has extended the base of the WSF accordingly.

SRK was unable to model any internal concrete bunds anecdotally reported to protect the drainage lines running in the WSF, as no details were available, and they were not intercepted during drilling. The external retaining bunds are clay cored earthen embankments. The deposit has been considered as a single domain for the purposes of the estimation reported herein. There are no identifiable hard physical boundaries, geological boundaries or grade boundaries which can be modelled within the WSF other than the upper and lower surfaces and the encompassing bunds and therefore these define the volume of the single domain. All estimations have been carried out within the global volume of the WSF.

A final model for the waste material was constructed from a combination of point files. These were created using a survey of the WSF and the topography of the base of the WSF, which was based on drilling which intersected the clay base. Surfaces have been interpolated in Leapfrog and combined to represent a volumetric domain which encompasses the entire WSF volume. The WSF measures approximately 590x370 m, the average vertical thickness is 12 m, although the surface of the WSF is uneven and the thickness ranges from approximately 8 to 30 m.

# 10 MINERAL RESOURCE ESTIMATE

The Mineral Resource Estimation for the Former Bicapa-Târnăveni chemical works WSF was based on the assay data obtained as part of the 2013 drilling campaign, some weathering of the upper material may have occurred. For this report $Cr_2O_3$, MgO and CaO variables were estimated along with dry density. The variables were estimated into a 3D block model based on an 8m x 8m x 4m parent block size covering the WSF. Full details of the Mineral Resource Estimation can be found in Technical Appendix A, the competent person consent form can be found in Technical Appendix B.

Most samples were taken at 1m intervals. Where significant differences were observed within an interval (colour, grain size, mineralogy) the samples were sub-divided into shorter lengths but in most cases the 1m interval held. Table 10-1 below summarises the statistics for the un-composited (raw) data and after compositing to 1m intervals downhole. The differences between the mean and variance of the two datasets is marginal and not considered significant. It was decided to carry out the resource estimation using the 1m composite data.

**Table 10-1: Summary statistics for the raw (un-composited) and 1m composite drill assay data**

| Raw | Samples | Minimum | Maximum | Mean | SD | CV | Variance | Skewness | |
|---|---|---|---|---|---|---|---|---|---|
| Cr | 862 | 0.11 | 20.06 | 5.03 | 1.98 | 0.39 | 3.94 | 2.31 | |
| Mg | 862 | 1.06 | 31.16 | 23.7 | 5.89 | 0.25 | 34.73 | -2.49 | |
| Ca | 862 | 2.01 | 53.1 | 23.29 | 3.8 | 0.16 | 14.46 | -1.87 | |
| 1mcomp | Samples | Minimum | Maximum | Mean | SD | CV | Variance | Skewness | mean diff |
| Cr | 856 | 0.11 | 18.31 | 5.05 | 1.92 | 0.38 | 3.7 | 2.16 | 0.34% |
| Mg | 856 | 1.06 | 31.16 | 23.8 | 5.64 | 0.24 | 31.77 | -2.48 | 0.43% |
| Ca | 856 | 2.01 | 53.1 | 23.37 | 3.58 | 0.15 | 12.84 | -1.59 | 0.34% |

Figure 10-1, Figure 10-2 and Figure 10-3 show the statistical plots for the three variables (1m composite data). In the Cr2O3 plots (Figure 10-1) there is clear evidence for a high grade tail however it was considered that, given the nature of the deposit and the fact that the high grades occur within adjacent drill holes and at similar depths within the deposit, they can be considered a viable component of the grade distribution and there is no need data capping.

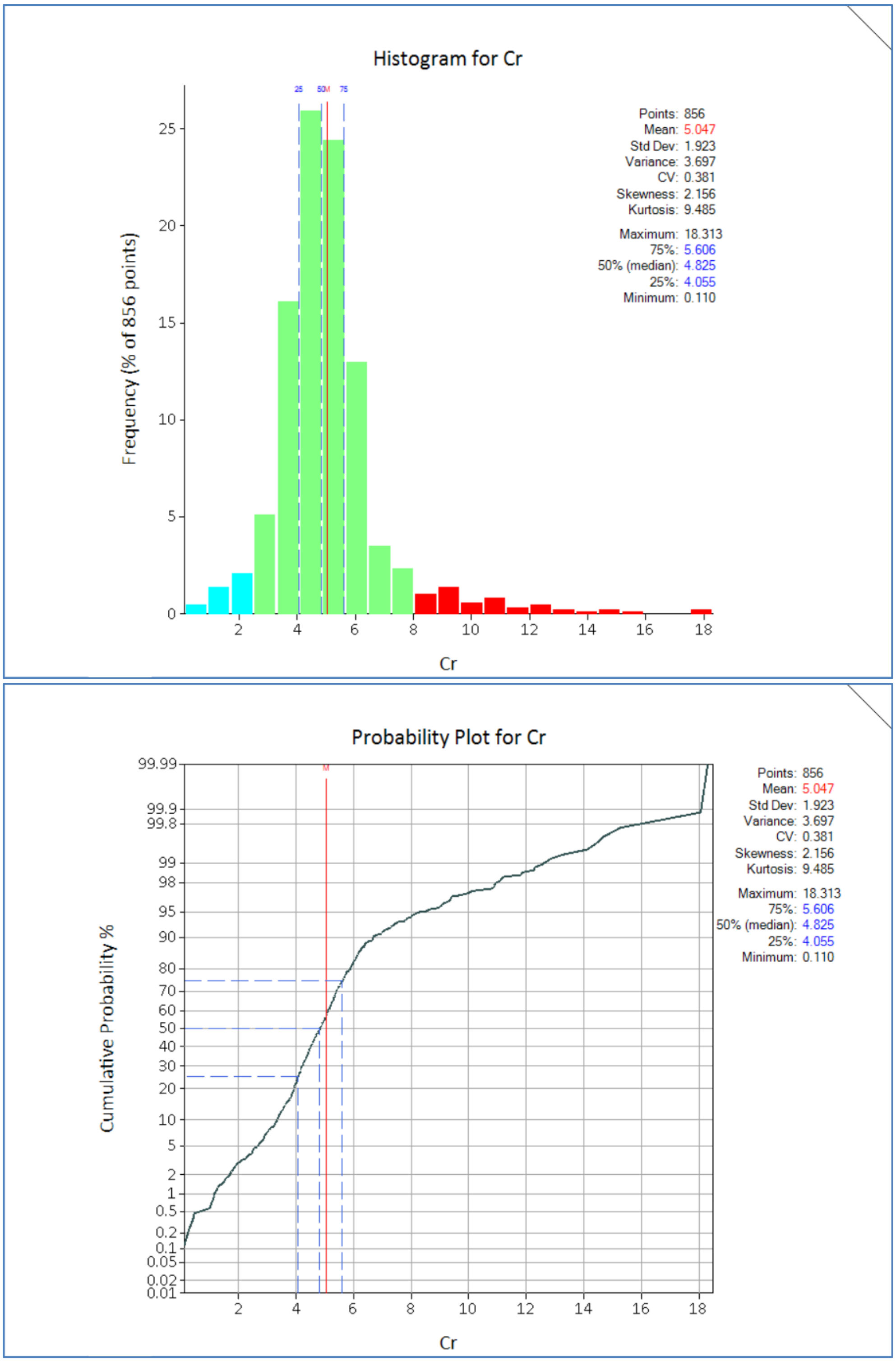



**Figure 10-1: Histogram (UPPER) and probability plot (LOWER of Cr2O3 1m composite assay values obtained from the 2013 drilling campaign**

Similarly, for the MgO plots (Figure 10-2), the strong negative skew with a tail of low grades is coincident between adjoining boreholes and at similar depths. Therefore, it was considered appropriate to retain these grades.

The histogram and probability plot for CaO (Figure 10-3) shows a very clear normal distribution and no data cutting was required for this variable.

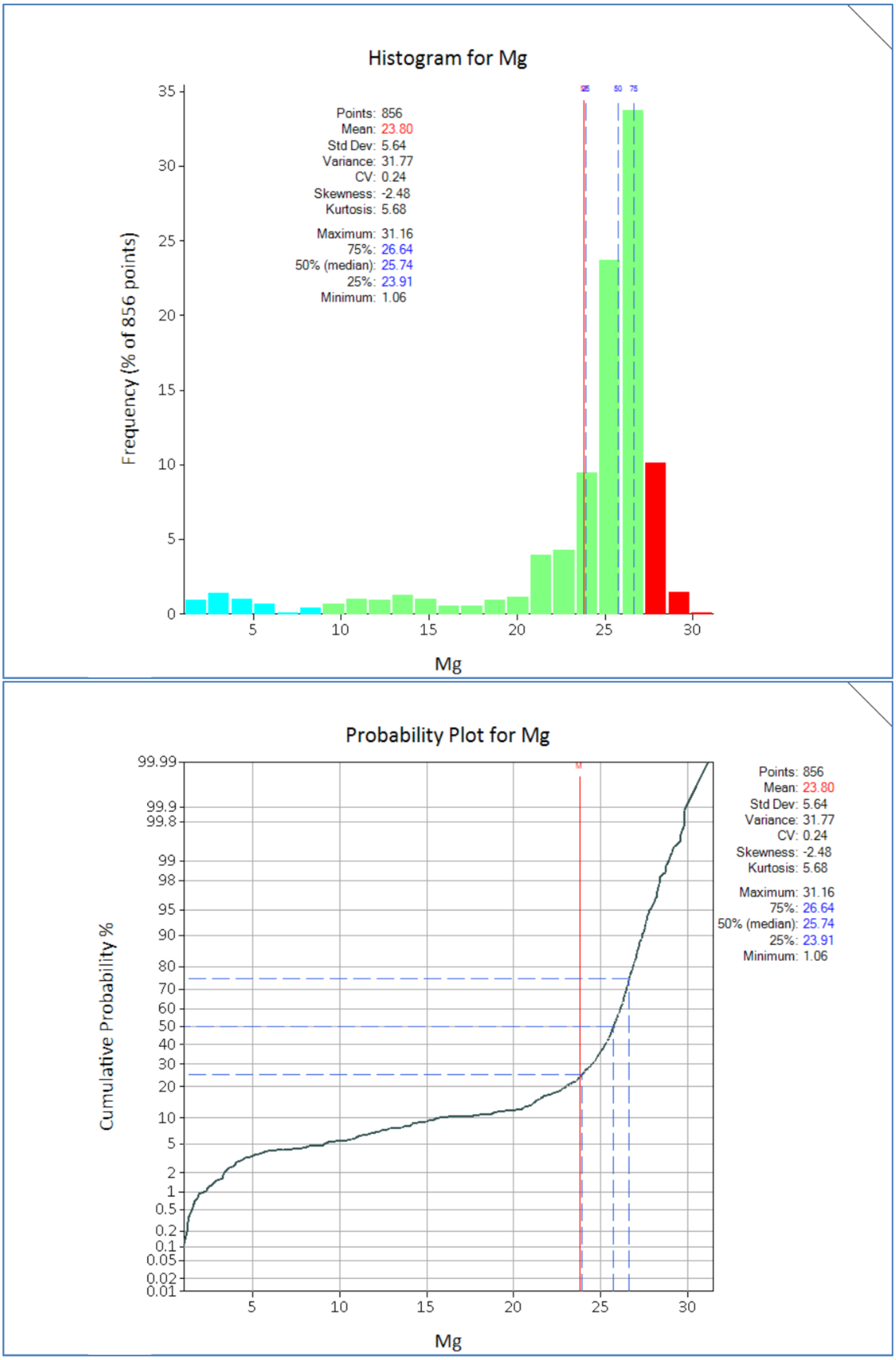



**Figure 10-2: Histogram (UPPER) and probability plot (LOWER) of MgO 1m composite assay values obtained from the 2013 drilling campaign**

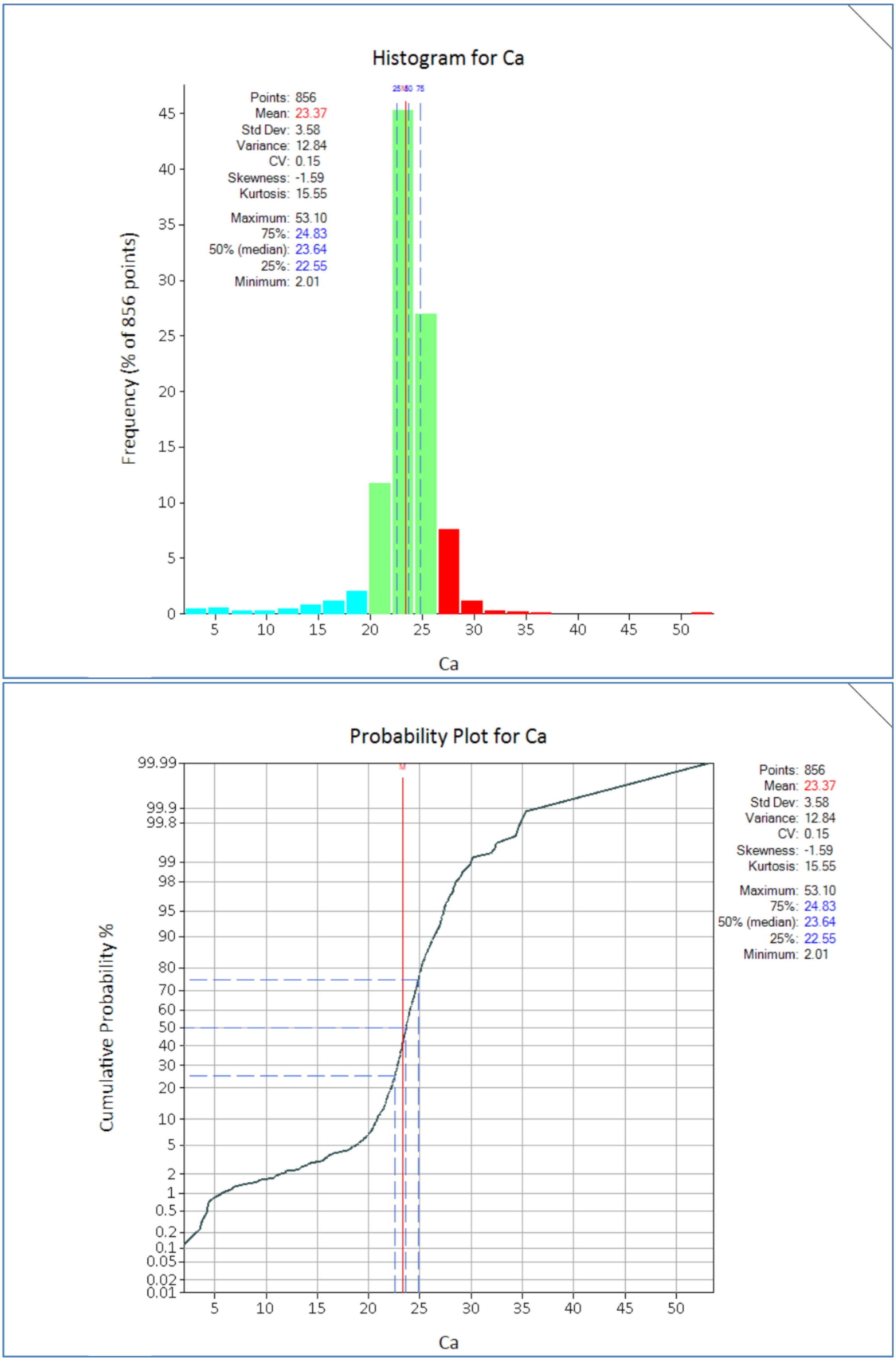



**Figure 10-3: Histogram (UPPER) and probability plot (LOWER) of CaO 1m composite assay values obtained from the 2013 drilling campaign**

The results of the geostatistical analysis produced variograms for the three primary variables. SRK notes that:

- The relatively short distance in the primary directions lead to a limited number of holes available at the longer lag intervals limiting the range of reliability of the variograms.
- The variable nature of the grade distribution within the deposit caused by the nature of the style of deposition and the variable nature of the feed material into the repository during its lifetime limits the range of the semi-variograms.

The vertical (downhole) variograms generally show a robust experimental variogram and can be modelled to between a 6-8m maximum range. The directional variograms generally show a high nugget variance and without the benefit of the vertical variogram modelling they would be considered close to pure nugget effect. The conclusion is that the grade variability within the WSF is relatively high and that the 50m hole spacing is at the limit of what could be used to reliably inform blocks between the holes.

Prior to construction of the block model, the variogram models are used to evaluate the perceived quality of the planned kriged model in a process known as Kriging Neighbourhood Analysis (KNA). This process evaluates a number of factors which help to quantify the quality of the resulting final block model.

Given the hole spacing in the WSF of 50x50m a realistic block size could be expected to be approximately 1/3 of this spacing at around 15-20m. However, due to the need to accurately define monthly production tonnages, a number of smaller block sizes were also evaluated. The results show that the 8m x 8m x 4m block size gives a relatively high slope of regression (SoR) value and range compared to some larger blocks. Also, the negative weights analysis for this block size shows that there is not a significant penalty in negative weights when dropping down to this block size. In addition, the results show that up to a maximum of 24 composites used for estimation of $Cr_2O_3$ block values will generally not produce any negative kriging weights. Also using a maximum of 24 composites will produce a range of SoR results with the majority above 70%.

The following table summarises the prototype for the resource block model created for the Former Bicapa-Târnăveni chemical works WSF 2019 Mineral Resource.

**Table 10-2: Block model prototype for Former Bicapa-Târnăveni chemical works WSF Mineral Resource estimate March 2019**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Min Coordinates** | Y | 535250 | X | 443550 | Z | 260 |
| **Max Coordinates** | Y | 535690 | X | 444150 | Z | 312 |
| **Parent Block size** | Y | 8m | X | 8m | Z | 4m |
| **Sub Block size** | Y | 0.5m | X | 0.5m | Z | 0.25m |
| **Rotation** | Bearing | -22 | Dip | 0 | Plunge | 0 |

The block model was interpolated using the search radius of 120m x 120m x 8m with the primary orientations along the 040° and 130° directions and using a minimum of 8 and maximum of 24 composites per block. No octants were used, and the search ellipse used a single domain.

Block values were interpolated by ordinary kriging for $Cr_2O_3$, MgO, CaO and SoR. Dry density values were calculated using and inverse distance interpolant (power ^1) utilising the same search ellipse and min/max samples as the kriging.

SRK has subsequently validated the interpolated grades using visual, statistical and sectional validation methods to confirm the robustness of the parameters used and that the resultant model reflects the available data. The results indicate that the kriging parameters are allowing the block model to accurately represent the distribution and average grades of the source samples.

# 11 MINERAL RESOURCE CLASSIFICATION AND STATEMENT

Given the high confidence implied by the results of the KNA and the resulting SoR model. The grade model alone allows the classification of the deposit as Indicated Mineral Resource under the guidelines set out by the JORC code (2012) and the PERC code (2017).

The drill spacing can be at the limit of reliability and if wider drilling had been used then it is likely that no useable semi-variograms could have been produced. Additionally, the use of 1m sampling vertically has had the beneficial effect of allowing the vertical variability to be well defined. Based on the above it is the Consultants opinion that the geological understanding of the deposit would allow the application of an Indicated category.

The Mineral Resource Statement for the Former Bicapa-Târnăveni chemical works WSF is based on the results of the drilling carried out in 2013 and the subsequent test work conducted by WET and their consultants. The classification applied by the Consultant and reported in Table 11-1 is based on the Consultants understanding of the deposit structure and grade distribution as implied from the supplied drill hole database. Additionally, the Consultant has drawn on the information contained within the 2013 SRK report, specifically regarding the QAQC analysis of the check samples and duplicates. At the time of reporting, the Consultant has not carried out a site inspection and was not present at the time of the 2013 drilling programme.

The Mineral Resource Statement is reported at a 0.0% Cut Off Grade. The reasoning behind this is the fact that the company plans (and is actually required) to excavate the contents of the WSF in their entirety regardless of grade variations.

**Table 11-1: Former Bicapa-Târnăveni chemical works WSF JORC Compliant Mineral Resource Statement, dated May 1st 2020**

| Domain | Category | Tonnes | SG | $Cr_2O_3$ % | MgO % | CaO % | $Cr_{(eq)}$ % |
|---|---|---|---|---|---|---|---|
| WSF | Measured | - | - | - | - | - | |
| | Indicated | 1,920,100 | 0.98 | 5.01 | 24.07 | 23.34 | 10.75 |
| | **Meas+Ind** | **1,920,100** | **0.98** | **5.01** | **24.07** | **23.34** | **10.75** |
| | Inferred | - | - | - | - | - | |

*It is noted that additional calcium product is recovered due to lime addition in the purification of the final product and that liquid ammonia is produced as a byproduct of the processing process. Combined these 2 sources add a further 1.01% $Cr_2O_3$ equivalents to the project revenues.*

Given the high confidence implied by the results of the KNA and the resulting SoR model. The grade model alone allows the classification of the deposit as Indicated Mineral Resource under the guidelines set out by the JORC code (2012) and the PERC code (2017).

The drill spacing can be considered to be at the limit of reliability and if wider drilling had been used then it is likely that no useable semi-variograms could have been produced. Additionally, the use of 1m sampling vertically has had the beneficial effect of allowing the vertical variability to be well defined. Based on the above it is the Consultants opinion that the geological understanding of the deposit would allow the application of an Indicated category.

The Mineral Resource Statement for the Former Bicapa-Tarnaveni chemical works WSF is based on the results of the drilling carried out in 2013 and the subsequent testwork conducted by WET and their consultants. The classification applied by the Consultant and reported in Table 4 3 is based on the Consultants understanding of the deposit structure and grade distribution as implied from the supplied drillhole database. Additionally, the Consultant has drawn on the information contained within the 2013 SRK report, specifically regarding the QAQC analysis of the check samples and duplicates. At the time of reporting, the Consultant has not carried out a site inspection and was not present at the time of the 2013 drilling programme.

The Mineral Resource Statement is reported at a 0.0% Cut Off Grade. The reasoning behind this is the fact that the company plans (and is actually required) to excavate the contents of the WSF in their entirety regardless of grade variations."

In terms of "reasonable prospects for economic extraction" the WSF meets the requirements to be mined in its entirety and the issue of whether it meets a "Reserve" comes down to whether certain areas or blocks fall below an economic grade when looked at in conjunction with their Cr(eq) grade which was calculated using the processing recovery and cost parameters provided by Ecotech. That said, this is a fairly unique situation in terms of resource and reserve classification and thus the mineral resource can be considered equivalent to the mineable reserve.

# 12 MINERAL PROCESSING AND METALLURGY TESTING

## 12.1 Introduction

Options for processing of the wastes contained in the WSF can be split into two phases, the first was undertaken by the state, starting back in the late 1970's and 1980's, and the second was the testing implemented by WET, after their acquisition of the site in 2012.

## 12.2 Historical Work

The historical trials were carried out under the auspices of the State central R&D planners and were designed to provide a feed to the existing chemical facilities within the Bicapa works for the potential resulting products. Several routes were shown to have potential, one process was selected for construction, but the economics were simply not there at the time, so nothing was implemented. Since then new technologies such as ion exchange have become more readily available, energy recovery has improved and the general availability of plant and reagents within Romania make the project more attractive.

## 12.3 Client Processing and Metallurgical Test work

The Client, after reviewing the historical trials, used two Romanian Universities, MEAB Chemie Technick GmbH and SGS Australia to help develop a suitable process. With all this background work the concept of the existing process emerged and WET created a batch processing pilot plant on site to develop further understanding of the process. A batch pilot plant was used due to funding constraints preventing the development of a continuous pilot plant. The pilot plant was operated by Stefan Komavies, the general manager of the former Bicapa works, on behalf of WET, with the aid of several of his former colleagues from the works. The main stages of the pilot plant are as follows:

1. Hydration.
2. Carbonation
3. Precipitation
4. Ion Exchange
5. Re Carbonation
6. Ion Exchange
7. Precipitation
8. Calcination
9. Finished Product 1 (on Pilot Plant) – actual intermediate product - MgO
10. Ion Exchange
11. Crystallisation
12. Finished Product 2 (on Pilot Plant) – actual intermediate product – $(NH_3)_2CrO_4$
13. Calcination
14. Leaching – $NH_4Cl$
15. Washing > Discharge of Final Waste
16. Ion Exchange
17. Purification $CaCl_2$
18. Concentration
19. Finished Product 3 (on Pilot Plant) – $CaCl_2$

As can be seen from the stages above some of the final products were not produced by the pilot testing, including ammonia, chrome green and fused magnesia. It must be noted that ammonia and fused magnesia production are following standard industrial processes so is essentially de-risked and the cost per tonne for the ammonia product in TEM v47 has been set to an industrial quality ammonia benchmark, not a pure (>99%) ammonia product (180 USD/t)..

The pilot testing was conducted on material combined from two trenches, near boreholes F14 and F43, predominantly F43. The assay data for boreholes F43 and F14 is as follows in Table 12-1.

**Table 12-1: Borehole F43 and F14 Assay Data**

**Borehole F43**

| Composition | U.M. | Depth (m) | | | | Average |
|---|---|---|---|---|---|---|
| | | 0 - 1 | 1 - 2 | 2 - 3 | 3 - 4 | |
| Cr2O3 | % | 2,898 | 4,439 | 4,52 | 3,971 | 3,957 |
| MgO | % | 26,93 | 27,40 | 27,22 | 26,70 | 27,062 |
| CaO | % | 26,3 | 22,68 | 24,48 | 24,95 | 24,602 |
| Al2O3 | % | 4,04 | 4,06 | 3,47 | 3,34 | 3,727 |
| Fe2O3 | % | 5,75 | 6,05 | 6,36 | 5,48 | 5,91 |
| SiO2 | % | 4,64 | 5,87 | 5,78 | 4,57 | 5,215 |
| Na2O | % | 0,15 | 0,54 | 0,65 | 0,65 | 0,497 |

**Borehole F14**

| Composition | U.M | Depth (m) | | | | Average |
|---|---|---|---|---|---|---|
| | | 0 - 1 | 1 - 2 | 2 - 3 | 3 - 4 | |
| Cr2O3 | % | 4,124 | 4,306 | 3,915 | 4,14 | 4,12 |
| MgO | % | 27,7 | 27,58 | 27,57 | 25,58 | 27,10 |
| CaO | % | 23,27 | 24,56 | 24,39 | 27,28 | 24,87 |
| Al2O3 | % | 3,45 | 3,40 | 2,94 | 2,72 | 3,12 |
| Fe2O3 | % | 6,18 | 6,19 | 5,30 | 4,10 | 5,64 |
| SiO2 | % | 6,99 | 7,58 | 6,30 | 4,80 | 6,41 |
| Na2O | % | 0,06 | 0,19 | 0,04 | 0,05 | 0,085 |

To date some 159 trials have been undertaken and recorded on the batch pilot plant, reprocessing some 3.16 t of COPR, this is approximately 0.017% of the deposit. It is important to note that the final chrome green product was not produced on the batch pilot plant, neither was the fused magnesia product. The chrome green product has only been produced at a very small (laboratory bench) scale at Institutul National de Cercetare – Dezvoltare pentru Chimie si Petrochimie (ICECHIM) laboratory in Bucharest, it has not been done at pilot scale and has only been replicated six times on processed COPR. The fused magnesia product has not been produced to date; however, it is not a novel process, unlike the chrome green one. Analysis of the products and intermediaries have been undertaken both internally and with external certified laboratories. Whilst a chrome green product has been produced in the laboratory from site feed solutions it is only on a laboratory scale and it is a novel process so there is some residual risk attached to commercial production.

## 12.4 Risks and Opportunities

Continuous pilot testing of the process is required to ensure that the same results and recoveries from the batch testing can be achieved on a continuous basis. This would also allow the ammonia recovery to be demonstrated. An allowance has been made for the pilot testing in the economic model.

The chrome green and fused magnesia products need to be produced more frequently and on a semi-industrial level to determine if there are variations with recovery depending on feed characteristics or variation in other circuit parameters, the quality of the fused magnesia produced also needs to be determined experimentally. The piloting is particularly important for the chrome green as the process is novel and commercially unproven.

Much of the batch pilot testing was conducted on samples from one borehole, the limitations of this are discussed in more detail in Section 14.6.

Whilst WET has classified the waste (post processing) as being non-hazardous, and confirmatory testing has been provided to SRK of the residue chemistry, no assessment has been conducted to confirm that the residue is non-hazardous according to the Extractive Waste Directive (EWD 2006-21-EC). The final residue produced during the most recent pilot trial witnessed by Dr Rob Bowell contained 0.243% w/w of Cr(VI).

The waste facility is being designed to hazardous specifications and hence the impact of this will not be significant, although there are more management measures required for a category A waste facility.

The chrome green recovery process is based on a proprietary process. The exact licensing arrangement is not known by SRK, but we understand that WET has a signed agreement to commercialise the chrome green proprietary process.

WET has informed SRK that under the licence agreement for the proprietary chrome green process two payments are to be made to the inventor. The first is after the completion of the CPR and the second is after the successful awarding of the Patent for the process. These payments are provided for within the TEM and there will be no ongoing royalty payments during the production phase of the project. Further details can be found in Appendix D.

# 13 EXCAVATION OF MATERIAL

## 13.1 Introduction

As stated in previous sections, the reclamation project is such that either all the COPR within the WSF is reprocessed or none.

The following sub-section summarises some of the detail provided to SRK from WET, full details of the excavation plan can be found in the WET excavation plan Rev 7 and associated appendices, (WET, 2020).

The WSF is contained by a clay dyke walls (6m in height when built) around the full perimeter and a heavy clay base (assumed to be in the order of 1 m thick). As the capacity of the WSF was required to increase, further height was added using dried COPR to form a dyke stepped to the inner area from the original dyke, analogous to an upstream raise of a tailing's storage facility. A concrete retaining wall was added in the late 1970's to provide additional security for the WSF for both structural strengths to allow additional capacity and to minimize chromium contamination egress from the WSF. Figure 13-1 depicts a simplified structure of the WSF.

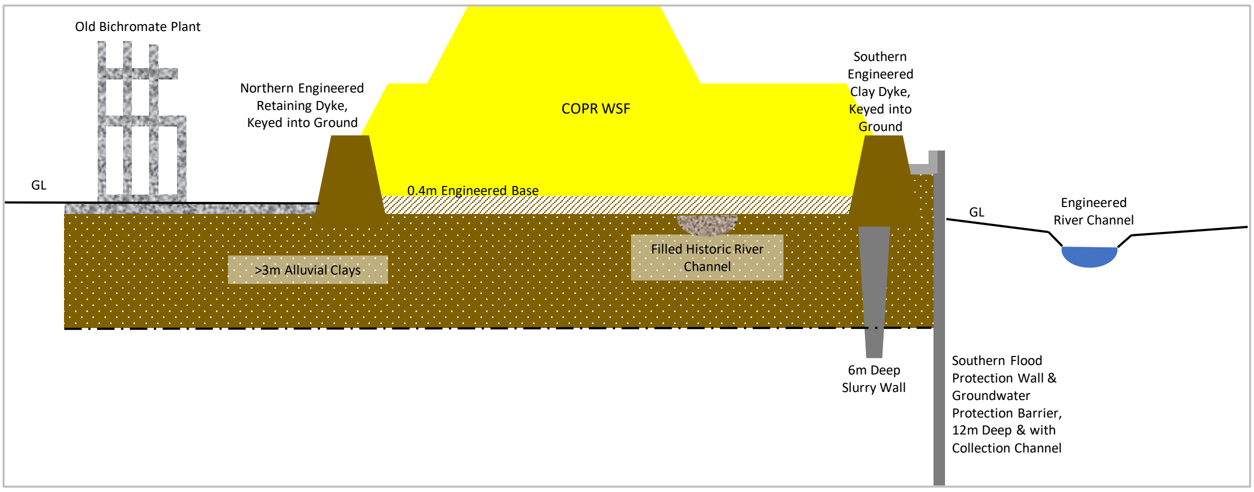



**Figure 13-1: Simplified Cross Section of the Existing WSF**

In addition to the all or none reprocessing requirement, permitting restrictions require that all waste generated from any reprocessing must be stored within the original footprint of the existing WSF, but with an upgrade in environmental protection such that current EU hazardous waste regulations are met.

## 13.2 Key Design Criteria

In summary, the key permitting restrictions placed on the reclamation of the existing COPR WSF, with relevance to the excavation operations, are:

1. Any waste generated by the reprocessing of the COPR WSF must be stored, long term, within the footprint of the existing WSF.
2. The existing lower protective clay barrier of the WSF cannot be disturbed (Figure 13-2), and,
3. The new waste facility must meet the current European Union and Romanian hazardous waste criteria.

**Figure 13-2: Base of the WSF, with the transition from green COPR on the right to the clay layer on the left**

The main assumptions used for the excavation study are:

- *In situ* wet density: 1.86t/m$^3$;
- *In situ* dry density: 0.97 t/m$^3$;
- Assumed clay liner thickness of around 1.0m;
- Assumed swell factor for excavation: 30%;
- Given the nature of the excavated material the struck capacity of all excavation buckets is assumed;
- 61% reduction in the amount of final waste generated in terms of tonnage;
- Final Waste Material (FWM) bulk density 0.82 t/m$^3$ (NB this is bulk density);
- Mobile plant availability: 85% of the 9-hour excavation shift;
- Operating hours for excavation & FWM return – 9-hour shift / 7 days week. WET assumes use of the daylight hours for safety and security on the excavation site. Shift patterns currently being assessed (i.e. 3 on 3 off, etc.).

WET proposes to employ a Load, Haul, Dump (LHD) methodology for the recovery of the COPR from the WSF, whereby a Long Reach Excavator (LRE) – 17 meter reach Sennebogen 835E tracked excavator will be employed on the working face to drag the COPR downwards to ground level, heaping the materials such that it can be picked up by Frontal Wheeled Loader (FWL) JCB 457 and placed into an ADT – type Hydrema 922F HM LGP is proposed. Full details for the equipment and their volumetric capacities are found in Table 13-1.

**Table 13-1: Mobile Plant for Primary Excavation Activities**

| *Nr* | *Plant* | *Capacity, m$^3$* |
|---|---|---|
| 1 | Long Reach Excavator (LRE) – Sennebogen 835E K16 ULM | 17m – reach<br>2m$^3$ bucket |
| 1 | Frontal Wheeled Loader (FWL) - JCB 457 | 3.5m$^3$ |
| 2 | Articulated Dump Truck (ADT) – Hydrema 922F HM LGP | 12m$^3$ |
| 1 | Dozer - Caterpillar D4 LGP | |
| 1 | Utility assistance vehicle - JCB 4CX | 2m$^3$ |

The proposed excavation plan (Figure 13-3) is broken down by cells, both for the excavation phase and for the return phase as described in more detail in the following sub-sections.

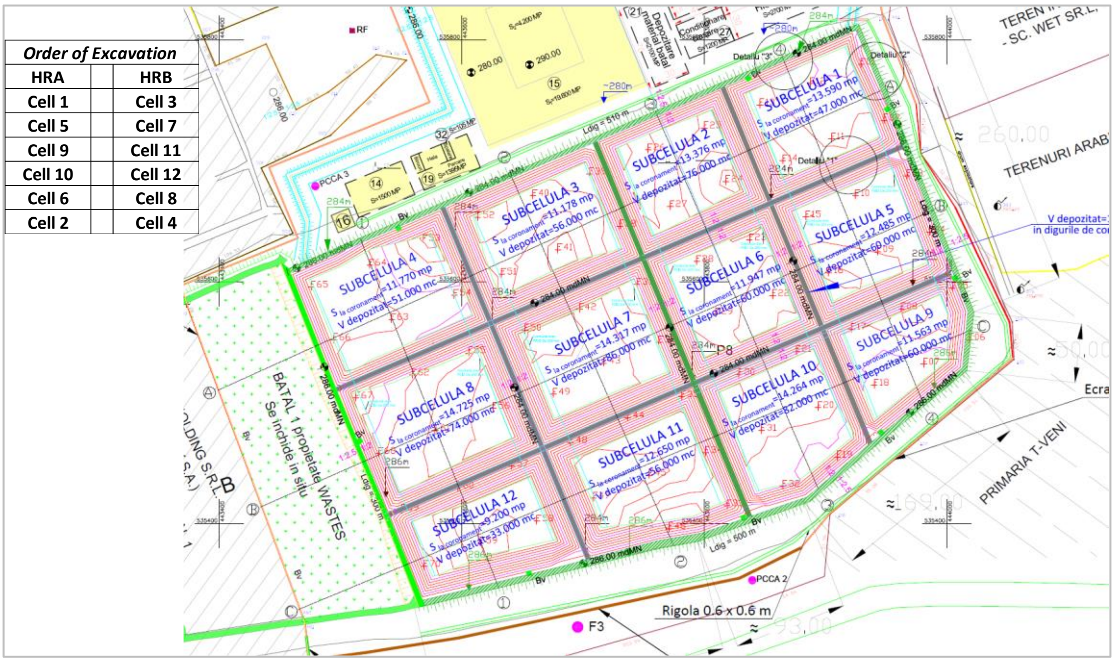



**Figure 13-3: Proposed excavation layout - cells and Haul Road A and B (HRA and HRB)**

The two haul roads (HRA & HRB) will have a working width of 8m and will be fully lined using road protection matting to attempt to ensure year-round safe access surfaces. While the Articulated Dump Trucks (ADT) units are 3.18m wide and there are only 9.3 trucks per hour with 2 trucks in operation. They will require a 7.3m turning radius and are Low Ground Pressure (LGP) machines, in order to aid productivity an additional section of Xtreme matting would be added to the turnaround area at the end of the haul road making the turnaround area 10 x 8m. WET will also have 400m$^2$ of Xtreme matting available to create a working pad for the primary excavation operations.

This section summarises the studies undertaken to evaluate the material movements of both the COPR and the reprocessed waste. The excavation activities can be split into 3 distinct phases and they are discussed in more detail in the following sub-sections:

1. Pre-excavation activities,
2. Excavation activities, and
3. Waste return and closure activities.

Aside from local and national taxes, WET have indicated that there are no royalties due for any commodities recovered from the site, details of this can be found in Appendix 16 (in Romanian) of the WET Excavation Plan (WET, 2020).

## 13.3 Excavation Operations

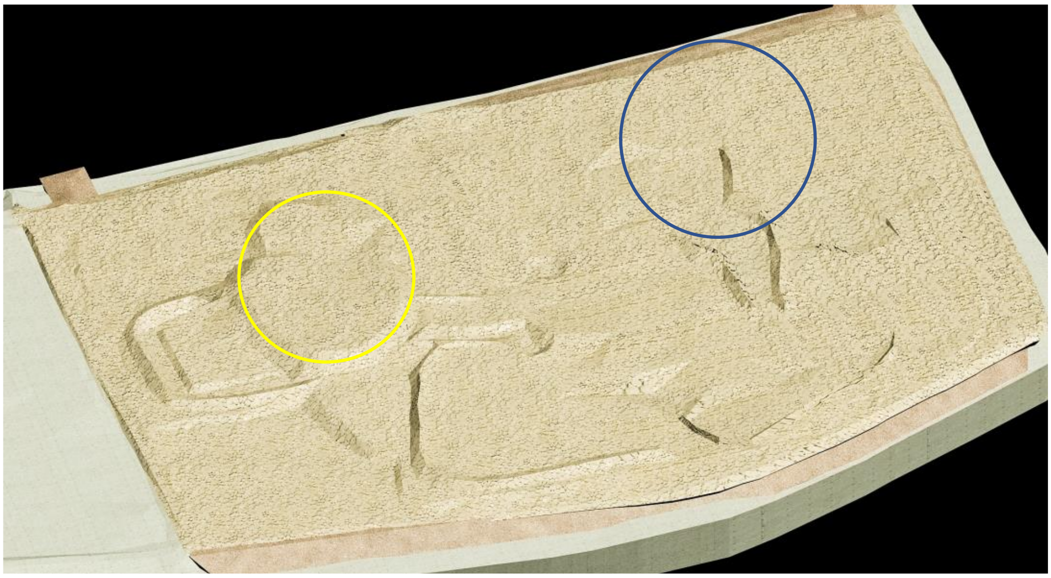
### 13.3.1 Pre-excavation

The pre-excavation activities include:

1. The installation of a coffer dam, to provide long term protection from outward subsurface transgression of Chromium contaminated waters from the WSF and for flooding risks from the nearby river inwards to the WSF and new processing facility;

2. Installation of a temporary cover, to minimise both water ingress into the existing WSF and to eliminate the risk of aerial dispersion of the COPR from the WSF during dry periods. Prior to this installation the existing surface of WSF will be levelled to promote water shedding and as the new waste must be returned to the footprint of the existing WSF then a temporary storage facility (TSF) is required to facilitate the clearing of the COPR from the WSF before the new WSF can be constructed. This will utilise two JCB CTL300T mini dozers, in conjunction with a JCB 4CX fitted with a grading adaptor. WET propose to contract Naue Romania to undertake the temporary cover installation;

3. There are land constraints on the size of the TSF, as it needs to be within the coffer dam containment zone, so to overcome this size constraint two pre-excavation relocations of COPR on the WSF are proposed – see Figure 13-4. The first movement will be the excavation of a large trench to initiate the route of haul road A. This will require the movement of 48,467m$^3$ from the NE corner to the SW corner, and it will utilise a rented long reach excavator and ancillary support plant, to dig from the top down. The second movement of material will take a large pile, located in the central area, and reposition in the NW corner. Due to the ease of excavation this movement it will utilise a frontal wheeled loader (FWL) and articulated dump trucks (ADT) to move the 41,721m$^3$.



Current configuration

First phase of excavations – 48,467m$^3$

Second phase of initial excavations - 41,721m$^3$

**Figure 13-4: Pre-excavation volume movements**

These initial material movements are necessary in order to permit the balance of materials removed from the Existing WSF and those being returned to the Renovated WSF.

The waste moved by the long reach excavator would be piled such that a JCB FWL can then transfer the waste to the mobile conveyor system for the repositioning of the waste. A Caterpillar D4LGP will then be utilised to spread the waste at the point of disposal.

In addition, a smaller excavator, a JCB JS160, working with a JCB 4CX loader and a Hydrema 922F ADT, will assist with the trenching operation.

The levelling of the large mound will use a JCB 457 FWL, as geotechnical trials with a Terex loader/excavator demonstrated the ease of excavation of this material, in junction with 2 Hydrema 922F ADTs. Unlike the long reach excavator, as the rest of the mobile plant will be utilised within the main excavation operations these are to be purchased as required and all mobile plant will be fitted with specialised cab filtration equipment and HEPA filters to minimise the risk of exposure to hexavalent chromium.

For these pre-excavation operations WET have allowed 10 weeks or 50 eight-hour shifts.

### 13.3.2 Main excavation period

The next phase is the main excavation phase of the proposed operation. WET propose to split the existing two WSF cells (WSF 2 & 3) into 12 new cells (Figure 13-3). Each existing cell will be split by advancing haul roads heading in a southernly direction. The haul road will be composed of load dispersal mats on 0.5 m of COPR. The haul roads will be accessed by breaking through the existing northern retaining dyke, such that the excavation operations are all being undertaken on the same level, and excavations operations will start in an easterly direction from the haul road and work in a clockwise direction around each existing cell.

The scale of operation is to supply the proposed processing plant with 27.5 tph of dry equivalent feed for a 24-hour basis. The excavation shift pattern will change to a 7 working day week and a 9 hour-shift. Like the processing plant operation, it is assumed that the excavation operations will be for 330 days of the year. In addition, the low *in situ* density of the COPR of 0.97 t/m$^3$ is such that all mobile plant attains a volume limit before the payload is reached.

The main excavation operations are split into two categories: primary and secondary. A Sennebogen 735E, electrically powered, will be the primary excavator and will drag material down the excavated face. This will initiate a working face on the eastern face of the pre-excavation trench, once an access road has been cut through the northern perimeter dyke of the WSF. The excavator will be sat on the final 0.5m of COPR, on load dispersal mats to remove any risk of damage to the lower clay barrier. A Caterpillar D4LGP will assist where high spots are beyond the reach of the excavator. Next a JCB 457 FWL will collect the piled COPR and transfer it to a Hydrema 922F ADT. All the mobile plant will run on the load dispersal mats on the last 0.5m of COPR, to ensure maximum protection of the clay barrier.

The Hydrema ADT will then transfer the waste to the proposed processing plant feed stock piling point. It is estimated that up to 72 trucks of COPR per shift will be transferred to the processing plant or 660 dry tonnes equivalent.

The secondary excavation operations are aimed at removing the final 0.5 m of COPR. They are phased with a 2-month lag on the Primary operations to permit a working space for all mobile plant operations. The Secondary operations will utilise a JCB JS160 excavator that will be sat on the COPR and will dig beneath itself to remove the final layer of COPR. Again, it will work in tandem with a Hydrema 922F ADT, selected in order to minimise fleet variation. In order to ensure that the lower clay barrier is maintained WET propose a low production rate of 3 trucks per shift or 27 dry tonnes equivalent. Operations are designed such that no traffic runs on the clay barrier surface and only on the load dispersion mats.

### 13.3.3 "Cleaned" waste return

When sufficient space is cleared of COPR this will form the base of the new waste cell. Initially it will be lined with a geomembrane and then a sand layer to promote drainage. This will be contracted to Naue. Next new waste from the reprocessing of the COPR will be returned.

The waste generated by the reprocessing of the COPR will be stored in a temporary storage facility, a covered stockpile. This waste will then be transferred by an Ameco semi-portal reclaimer on to an overhead conveyer then a series of linked mobile Telestak TL24 conveyors and finally a Telestak radial stacker TC241. When waste is returned to build the internal retaining dykes with a rate of 110 $m^3$/h assumed and as is the addition of 3% w/w of cement to aid stability within the dykes. The cement will blend with the waste as it travels along the conveyors. This returned material is then built into dykes by spreading the material out with two JCB CTL300Ts and then compacting 0.5 m layers with a JCB CB VW117D T41 vibro-compactor.

Following the construction of the dykes' waste is then returned to the constructed cell at a rate of 240 $m^3$/h. The radial stacker fills the void as it advances across the new cell and is assisted by the two JCB CTL300Ts.

Finally, Naue close the cell be applying a drain layer, geomembranes and then a soil cover. This is repeated for all 12 new cells.

Key to the excavation and waste return operations is the balance of the processing plant needs and the availability of the temporary storage facility. The need to maintain this balance has led to the sequence described previously.

## 13.4 Geotechnical Considerations

Geotechnical investigations have been undertaken on the WSF; however, the laboratory geotechnical testing of the cores was not possible as due to the high levels of hexavalent chromium no commercial laboratories would accept any samples. Therefore, only basic geotechnical assessments have been made with regards to trafficability concerns on the WSF with scoping input from SRK. WET commissioned F&R Worldwide to perform Cone Penetration Testing (CPT)/Dynamic Probe Super Heavy (DPSH) testing work on 25 locations (Figure 13-5) within the WSF Cells 2 and 3 (full details can be found in the WET excavation report, Appendix 7). Whilst CPT was requested, during the initial 3 sites the CPT method proved impossible to perform. The stabilisation outrigger augers for the rig struggled to penetrate the surface of the WSF. The initial 0.4m were light material after which the material for the first 2-3m is extremely solid and enough force could not be applied to the outriggers to allow them to bite into the material without causing equipment damage. The decision, in conjunction with SRK, was made to switch to DPSH. FRW has correlated the data to provide the required data to SRK.

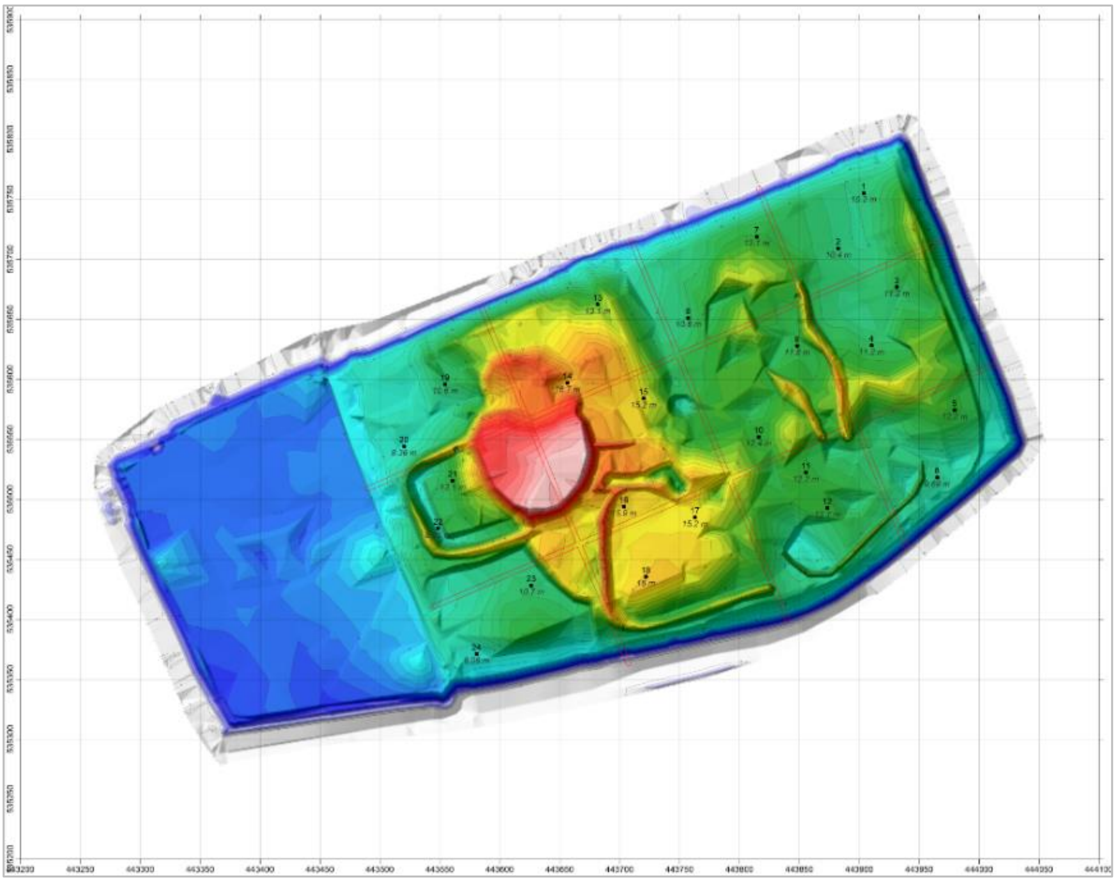


**Figure 13-5: Geotechnical testing locations**

The results of the DPSH tests implied that the COPR waste in the TSF was very weak and would probably not support itself. However, after further discussions with SRK, WET commissioned a local contractor with a backhoe loader to excavate a series of trenches. These trenches were typically 6 m long by 4 m deep and maintained vertical faces whilst the trench was open; these trenches were subsequently backfilled for safety purposes. SRK then concluded that the COPR is to be considered an atypical soil and was probably self-supporting. As such, for design purposes WET will utilise stable slope angles of 26$^{o}$ for 'long-term' faces and 35$^{o}$ for short term working faces. All mobile plant will be low ground pressure (LGP) options, and heavily trafficked areas will be covered with Xtreme load dispersion matting to further dissipate the ground pressure.

WET notes in their excavation report that in areas of the existing WSF have sat stable and exposed to the elements for many years at the natural angle of repose of 36$^{o}$. There is photographic evidence where it can be seen where prior to closure of the former processing plant an area was graded by a dozer and front wheel loader in preparation for receiving the waste COPR slurry. As such the bunded area was not used and these dyke walls have remained relatively intact at a height of 4m and a slope angle over 37 degrees angles and all for 17 years post closure. Notwithstanding this SRK notes there has been instances of machinery becoming stuck whilst travelling on top of the WSF, so precautions such as minimising vehicles on top of the WSF, LGP vehicles and matting should all be implemented.

However, WET acknowledges that excavation plans may need to change according to local conditions encountered. These variations will be on an ad hoc basis and are therefore difficult to foresee within this preliminary design, so a global design is utilised.

## 13.5 Risks and Opportunities

The material is an atypical soil from a geotechnical perspective, further investigative works should be completed prior to finalisation of predicted equipment utilisations and detailed slope designs. The density of the contained materials is very low, and the behaviour may be atypical.

SRK notes that significant precautions and measures have been put in place to ensure that the clay liner layer is not breached, either by the wheels/tracks of a vehicle or more likely an excavator bucket. Whilst the two-stage approach of excavation (with the 0.5m COPR protective layer) and the use of dispersal mats will significantly reduce the chance of any breach of the clay layer. In addition, WET propose to have fresh clay on site in preparation of such a breach and an emergency plan. The surveyor which is daily on site will have this quality control function and the added security of the full coffer dam provides additional containment.

There are very few boreholes which have intercepted the clay layer to a significant depth. It is understandable that the clay layer should not be breached to ensure that the integrity of the layer can be maintained. However, the integrity and depth of the layer should be determined as quickly as possible during pre-excavation activities, as mitigation measures will be required if the layer is thinner than anticipated or it is absent in specific areas.

SRK notes that precautions have been put in place to protect personnel within excavation machinery from chromium (VI) dust exposure, HEPA filters, positive air displacement etc, similar precautions do not appear to be in place for personnel who are operating outside, maintenance, surveying etc. The Surveyor will have HEPA masks available as would all personal which may need to be operating in the area outside of the excavation equipment. In addition, dust suppression misters are included in the equipment costs. Machinery maintenance is done out of the WSF area at the excavation equipment workshop. Technicians will have relevant PPE and there is an equipment washing bay for use prior to any maintenance being carried out.

An allowance has been made in the cost sheet for dust suppression which depending on how it is implemented should also reduce overall dust generation. There could also be the possibility of an exclusion zone around the currently operating area being established, based on dust dispersion modelling. This also needs to be considered in detail from the community perspective and be included in the EIA.

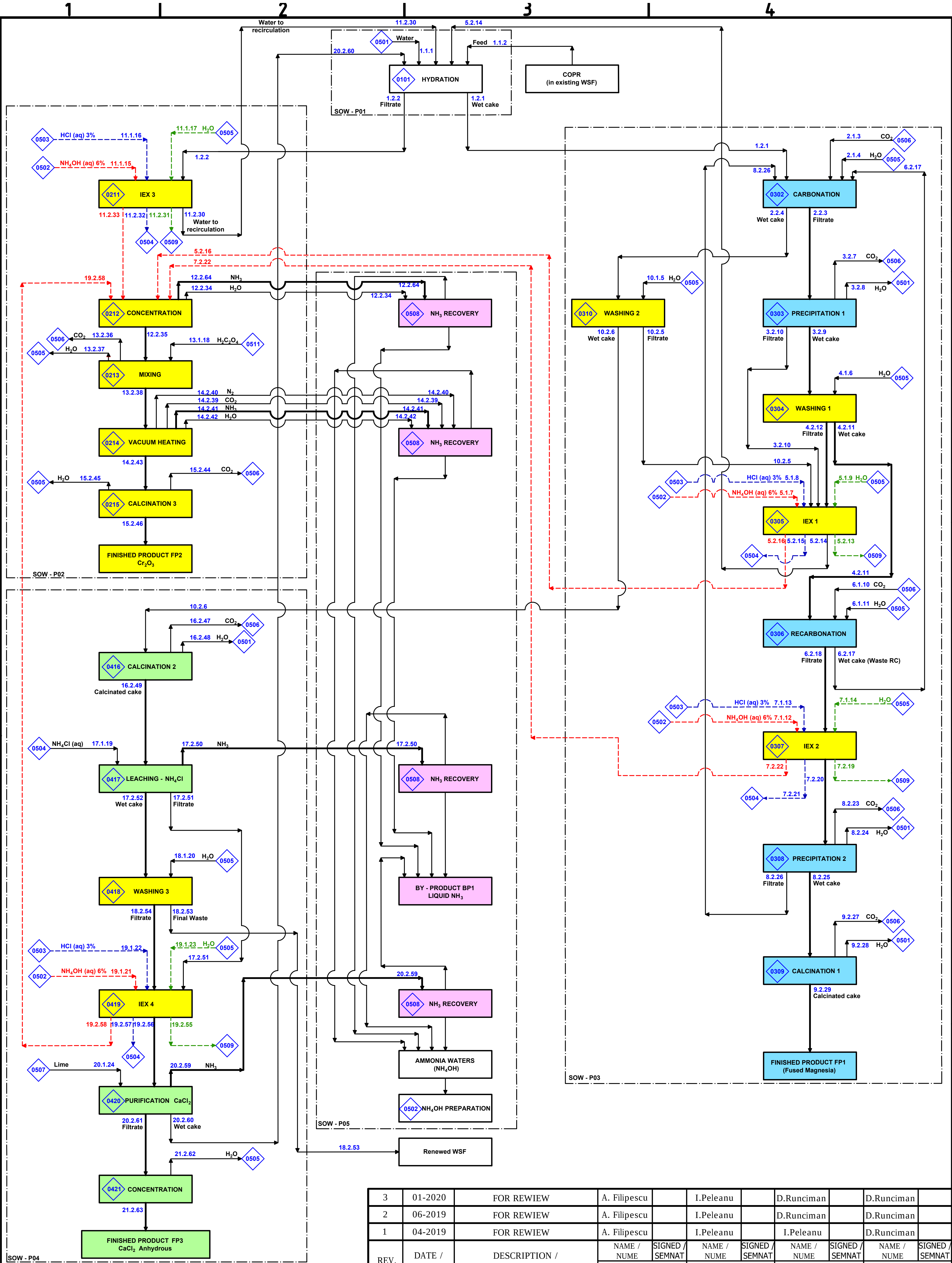
The addition of a wheel wash is also to be commended; their efficacy should be monitored closely during operations as per the new water permit. WET will review the ability to use fresh water only and separately pump the rinse water including soils directly to the hydration tank water system. This would then eliminate the need to monitor efficacy.

The utilisation and productivities of the excavation fleet which have been assumed are reasonable and conservative, however it is a small fleet so would be impacted if a key element required being taken offline.

There are various drivers that could impact the extraction method and rate, including an untouchable clay layer and not placing equipment on top of the dump; a specific excavation sequence to allow back fill; placement of and use of the mobile “in-pit” conveyor; operational space in the excavation area. These aspects need to be investigated further in the next phase of the study.

# 14 PROPOSED PROCESSING OPTIONS

Full detail on the proposed WET circuit can be found in the WET processing report. An outline flowsheet is provided below.




**LEGEND:**

**Plants Legend:**
P01 - Crushing/Milling & Hydration
P02 - Fabrication of $Cr_2O_3$ (Chrome Green Oxide)
P03 - Fabrication of MgO (Fused Magnesia)
P04 - Fabrication of $CaCl_2$ Anhydrous
P05 - Process Utilities

**Process Utilities Legend:**
0501 - Preparation of Process Grade Water
0502 - Preparation of $NH_4OH$ (aq) Regenerant Solution
0503 - Preparation of HCl (aq) Activation Solution
0504 - Preparation of $NH_4Cl$ (aq) Reagent Solution
0505 - Preparation of Tehnical Grade Water
0506 - Recovery & Storage of $CO_2$ (as gaseous $CO_2$)
0507 - Preparation of Lime Solution
0508 - Recovery & Storage of $NH_3$ (as liquid $NH_3$)
0509 - Waste Water Treatment (W.W.T.)
0510 - Preparation of Demineralized Grade Water
0511 - Preparation of $H_2C_2O_4$ (aq) Initiator Solution

**Notes:**
Continuous Processes Line
Discontinuous Processes Line (batch type)
Discontinuous Processes Line (batch type)
Discontinuous Processes Line (batch type)

**Abbreviations:**
"WSF" - Waste Storage Facility
"COPR" - Chrome Ore Processing Residue
"IEX" - Ion Exchange
"FP1" - Finished Product 1
"FP2" - Finished Product 2
"FP3" - Finished Product 3
"BP1" - By-Product 1

| REV. | DATE / DATA | DESCRIPTION / DESCRIERE | DRAFTED / DESENAT NAME / NUME | SIGNED / SEMNAT | ENGINEERED / PROIECTAT NAME / NUME | SIGNED / SEMNAT | CHECKED / VERIFICAT NAME / NUME | SIGNED / SEMNAT | APPROVED / APROBAT NAME / NUME | SIGNED / SEMNAT |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 01-2020 | FOR REWIEW | A. Filipescu | | I.Peleanu | | D.Runciman | | D.Runciman | |
| 2 | 06-2019 | FOR REWIEW | A. Filipescu | | I.Peleanu | | D.Runciman | | D.Runciman | |
| 1 | 04-2019 | FOR REWIEW | A. Filipescu | | I.Peleanu | | I.Peleanu | | D.Runciman | |

IPI
Bucharest, Romania

wastes ecotech srl

WASTES ECOTECH S.R.L.

# BLOCK FLOW DIAGRAM WET WSF - REPROCESSING PLANT

| DWG'S LEGAL OWNER/PROPIETAR LEGAL DESEN | SCALE/SCARA | DWG. NUMBER/NUMAR DESEN | SHEET/FILA | REV. |
|---|---|---|---|---|
| WASTES ECOTECH S.R.L. | 1:1 | WET-1809-BFD-BCP-01_E | 1/9 | 3 |

297X420

## 14.1 Hydration

After some initial screening, to ensure no foreign bodies, i.e. concrete blocks, tyres, etc enter the process, the feed material is initially wet milled to promote an increased surface area for enhanced extraction reactions. The milled material is then placed in stirred hydration vessels with water at a 1:5 ratio solids:liquid (S:L) and held for 24 hours, at near ambient temperature and pressure. Next the initial leachate solution is recovered, and the initial recovery of the mobilised hexavalent chromate ions is completed with an ion exchange resin. At this stage approximately 11% of the total chromium is recovered. The hydration water is then recirculated back to the next hydration batch.

## 14.2 Carbonation

The solids from the hydration stage are then passed to a carbonation stage, where the solids are then mixed with water (at a 1:6 S:L ratio) and pressurised with carbon dioxide to 2 to 5 bar(g). They are continuously mixed and maintained at a temperature below 35 C for 1 hour. This promotes the dissolution of the magnesium, but it needs to be monitored as it can also result in the mobilisation of calcium.

Next the solution containing the mobilised magnesium is separated from the solids by filtration and the residual solids are washed with clean water and that is then separated and collected. The magnesium pregnant solution is then heated to $95^{o}$ C to promote the precipitation of magnesium carbonate and this is then dewatered. Released carbon dioxide is recovered at this stage for reuse. The dewatering solution is then combined with the residual solids' wash waters and treated by ion exchange to recover the mobilised chromate ions. Here 25% of the total chromium is recovered. This cleaned water is then returned to the hydration stage and the start of the process.

The precipitated magnesium carbonate is then resolubilised in a second carbonation stage, under similar conditions but with a higher solid to liquid ratio (1:9 S:L). This magnesium pregnant solution is then passed over ion exchange resins to recover any residual chromate contamination. Here 34% of the total chromium is recovered.

The cleaned magnesium pregnant solution then undergoes another precipitation stage, again the carbon dioxide is collected, and the dried solids then undergo calcination to form a dead burn magnesia. Here carbon dioxide is collected and recirculated. This dead burn magnesia is then converted to the fused magnesia product by the use of a dedicated furnace. The fused magnesia from the furnace is then crushed and bagged to form a saleable product. In the economics for the process 64% of the total magnesium is recovered or 4.07 t/h fused magnesia. The barren solution from the precipitation stage is then returned to the primary carbonation stage.

## 14.3 Calcination and Ammonium Chloride Leach

The wash solids from the first carbonation stage are then calcined at 800 to 900 C for 1 hour, to promote the last mobilisation of chromium. These calcined solids are then subjected to an ammonium chloride leach at 28% w/w solution. This converts the calcium oxide present into a calcium chloride, mobilises the residual chromate ions and mobilises any remaining available magnesium into a magnesium chloride. The process releases ammonia gas that is collected and partially converted to a saleable liquid ammonia, equivalent to 3.6 t/h. The residual ammonia is used to form ammonia waters that are used to strip the pregnant ion exchange resins.

The calcium pregnant stream from the ammonium chloride leach is treated with the ion exchange resins to recover residual chromium. Here 6% of the total chromium is recovered. The calcium chloride stream is then treated with calcium oxide to promote the precipitation of magnesium hydroxide and purify the calcium chloride product stream. There is then a filtration process to recover the precipitated magnesium before the purified calcium chloride solution is concentrated to form the saleable anhydrous calcium chloride product that is bagged. 63.5% of the total calcium is recovered by the process or 10.7 t/h calcium chloride.

The precipitated magnesium hydroxide is then recirculated to the initial hydration stage of the process.

## 14.4 Final Waste and Chrome Oxide Recovery

The residual solids from the ammonium chloride leach are first washed, this water is combined with the pregnant calcium chloride stream, and the dewatered solids form the final waste of the process, circa 10.6 dry t/h. The dewatering is at a suitable level as to comply with the waste directive, whilst still facilitating handling.

Finally, all the chromate ions collected on the 4 stages of ion exchange are recovered by washing the resin with a 15% w/w ammonia water. This forms an ammonium chromate solution that is centrally concentrated by heating the solution to 60 C under vacuum, again released ammonia is captured and recirculated. The resins are regenerated with a 3% w/w hydrochloric acid solution.

The concentrated ammonium chromate is mixed with an initiator reagent, heated under vacuum, where the chromate ion is reduced, ammonia, carbon dioxide and hydrogen are released and collected, before the residual solids are finally calcined to product the final chromium (III) oxide product. Through this entire process 77% of the total chromium is recovered or 1.05 t/h chromium (III) oxide.

## 14.5 Proposed operating parameters

The process design capacity is based around the global average grades for the WSF and an average processing rate of 27.5 dry t/h, overview processing operating parameters are given in Table 14-1.

**Table 14-1: Proposed processing plant operating parameters**

| Plant | Input / Output Description | Molecular weight | Stream no. | Plant Throughput | | |
|---|---|---|---|---|---|---|
| | | | | Hourly | Daily | Yearly [1] |
| | | g/mol | | t/h | t/day | t/year |
| **Input** | COPR – Chromium Oxide Process Residue | - | 1.1.2 | 53.1 [2] (27.5) | 1,274 [2] (660) | 420,463 [2] (217,800) |
| **Output** | FP1/1 – Fused Magnesia | 40.31 | 9.2.29 | 4,10 | 98,64 | 32,553 |
| | FP1/2 – Magnesium oxide (MgO) | 40.31 | 9.2.29 | 4.19 | 100.66 | 33,218 |
| | FP2 – Chrome green oxide ($Cr_2O_3$) | 151.99 | 15.2.46 | 1.05 | 25.20 | 8,316 |
| | FP3/3 – Calcium chloride anhydrous; flakes ($CaCl_2$) | 110.98 | 21.2.63 | 10.66 | 255.84 | 84,427 |
| | FP2/3 – Calcium chloride di-hydrate; flakes ($CaCl_2$ x 2 $H_2O$) | 147.01 | 21.2.63 | 14.12 | 338.90 | 111,837 |
| | FP1/3 – Calcium chloride hexa-hydrate; crystallized ($CaCl_2$ x 6 $H_2O$) | 219.08 | 21.2.63 | 21.04 | 505.04 | 166,663 |
| | BP1 – Liquid ammonia | 17.03 | 12.2.64 & 17.2.50 & 20.2.59 | 3.576 | 85.824 | 28,322 |
| | Inert ("Final Waste Material") | - | 18.2.53 | 15.13 [2] (10.60) | 363.2 [2] (254.4) | 119,850 [2] (83,952) |

**NOTES:** *1 – Yearly throughput assumes 330 days/year on a 24/7 basis to give a 90.4% utilization.*
*2 – The value in the bracket is the "dry matter" throughput; otherwise, all throughput values expressed "as is".*

This gives a life of project of 9 years operation and 1 year for closure, this sits well within the emissions and operating permitting renewal cycle of 5 years. All the reaction vessels are designed at 10% overcapacity, for a 24/7 operation, available for 330 days per year. The exception is the ion exchange chromate recovery. The ion exchange for the initial hydration stage is sized for 97$^{th}$ percentile grade by mass, i.e. 5.52% $Cr_2O_3$, but assumes that all additional chromate ions, i.e. beyond the values predicted by the global average, could be mobilised, this permits flexibility in the design and ensures the capability to collect all mobilised chromate ions. The ion exchange within the carbonation stages are also over designed, again to the 97$^{th}$ percentile by mass, but this time it is assumed that the same percentage of chromate ions are mobilised. And finally, the last ion exchange is sized as per the global averages, as the higher-grade feeds are probably due to mobile chromate within the waste rather than partially oxidised forms from the original chromium oxide process.

## 14.6 Risks and Opportunities

As discussed in the processing section (Section 12) the batch pilot testing was conducted on trench samples in the vicinity of two boreholes (F14 & F43), head grade variability testing has not been conducted (either higher grade or lower) which could affect process efficiencies. Redundancy and additional/duplicate process stages may be required if the additional processing work that has been planned indicates that they are required. It should be noted though that this redundancy has already been added to the preliminary ion exchange circuits, which will make the process more able to handle varying feeds of Cr(VI).

It is important to note that the majority of the process uses industry standard processes that considerably de-risk the project in terms of demonstrated practice.

# 15 PROJECT INFRASTRUCTURE

## 15.1 Introduction

This section presents a summary of the review of support infrastructure i.e. ancillary infrastructure, access roads, power supply and relevant items under other site works related capital costs. The processing plant, and all activities within the fence line of the extraction area, including pioneer roads, mobile equipment and covering system therein are covered elsewhere in the CPR. Ownership and permits, specific environmental protection or remediation of ground contamination are also commented on elsewhere in the CPR.

## 15.2 Access

The Project area is easily accessible. It is located on a former industrial site, located on the western outskirts of Târnăveni. The site is accessible from national road DJ107 and then through the network of site roads of the former industrial site. The former industrial buildings have been demolished to the top of foundation level. Much of the material has been removed but demolition waste exists across the site. There are also disused railway sidings on the site.

### 15.2.1 Infrastructure

*Buildings*

A site layout has been developed providing a plot plan of the position of process and non-process buildings, which are located on the former industrial site to the north of the waste pile that will be processed. In total there are twenty-six building structures of which seventeen will contain processing equipment and comprise the processing plant. The remaining are denoted as:

- Office(s) – five
- Warehouse(s) – Two
- Workshops – two.

The two warehouse buildings are for Ammonium Chloride storage and the finished product warehouse, namely fused magnesia, chrome oxide green and calcium chloride. WET has sized the building around the processing layout and storage requirements.

*Utilities*

Electrical distribution and process water supply and reticulation within the processing buildings is incorporated within the processing plant description. General site electrical distribution, lighting, surface water management around structures and sewage and potable water facility and management will be designed at the next stage of study but allowances have been made in the cost estimate. This also includes a Bulk power supply is dealt with separately below.

*Security*

Security fencing is planned. A security system consisting of CCTV, motion sensors, and intrusion detection.

*Site Roads*

A network of site roads will be developed to facilitate access around the site. These are intended to be 5m wide with an unbound gravel surface suitable for load speed (e.g. <10 kph) movement of mobile equipment.

*Civil Works & Site Roads*

A network of site roads will be developed to facilitate access around the site. These are intended to be 5m wide with an unbound gravel surface suitable for load speed (e.g. <10 kph) movement of mobile equipment. Other general civil works will be required around the buildings.

### 15.2.2 Coffer Dam

The site is in a historical flood risk area. After a large flood occurred in the early 70's the Tarnava Mica river was straightened past the site and an upstream dam as well as the WET dam installed for water control. To prevent ingress of flood water during operations a coffer dam will be installed around the proposed processing plant and existing WSF to minimise the influence of groundwater and flood waters, the planned location of the dam can be found in the WET processing report. The coffer dam consists of an embedded steel sheet pile (SSP) wall which is sealed against water egress. The SSP installation is designed to act both as a coffer dam and flood protection by use of 15m in-ground and 6m above ground SSP wherever there is no existing clay dyke protection. The Company has approached a dewatering and piling company to provide an indicative cost. The concept design, SSP and sealant solution being provided by Arcelor Mittal's Luxembourg engineering team. A very early stage engineering schematic showing likely ground conditions have been assumed based on data from a drill hole completed by F&R Worldwide in May 2017 and resulting in a conceptual design of 21 m sheet piles. The Company has an allowance for a geotechnical investigation to inform preliminary design at the next stage. A specialist gate is required in the sheet pile wall to allow access, but which can be sealed closed should a chance of flooding occur, this item is included in the supplier quote and economic model.

### 15.2.3 Power Supply

Power, heat and steam are required for the process. A detailed schedule of requirements for energy and heat has been developed, based on a detailed equipment list, which provides a basis for requirements. The concept is to invite a specialist supplier to build the "Co-generation plant" ("Co-gen Plant" or "combined heat and power plant; CHP") and for WET to take on ownership and operation to supply all the project needs. The Co-generation plant would incorporate gas turbines and thus would avail of low gas prices for energy supply. There will be a back-up connection to the grid, which would allow the operations with the exception of the Fused Magnesia facility to continue operations. 6 x700 kVa gen sets are allowed for ESD purposes.

### 15.2.4 Surveys

From a topographic perspective the ground where the support infrastructure will be placed appears relatively level.

Whilst old site layout plans are available, there has been no significant ground investigation to inform civil works, roads or earthwork or buried services design and this will need to be carried out prior to construction. A general area conceptual model of the geology of the valley does exist but is very broad scale.

Due to the site's history it is highly likely natural ground conditions will be complicated by made ground, perched water, remnant foundations and buried services and possible unforeseen soil and ground water contamination (we understand that some research has been undertaken to identify areas with a higher potential for contamination).

### 15.2.5 Cost Estimation

The capital estimate is presented in the Financial Model. The total direct capital expenditure attributable to items described as Site Infrastructure is around USD 34.59m and buildings and interrelated utilities and construction works for the processing plant is USD 18.46m. The overall contingency applied is circa 11%.

**Table 15-1: Capital Costs associated to Support Infrastructure**

| Details | Contingency level Applied by the Company (%) | Totals USD (excl. contingency) | Totals USD (inc. contingency) |
|---|---|---|---|
| Demolition, Fencing, security | 10% | 1.73 | 1.90 |
| Site entrance and main road works | 20% | 0.44 | 0.53 |
| Site Utilities | 20% | 2.46 | 2.91 |
| Site (Non-process buildings) & general construction | 10% | 22.27 | 24.49 |
| Coffer Dam | 10% | 7.70 | 8.47 |
| Sub-Total Site Support | | 34.59 | 38.30 |
| Plant Buildings, General and Utilities | 10% | 18.46 | 20.97 |
| Sub-Total Plant Buildings | | 18.46 | 20.97 |
| Total | | 53.05 | 59.26 |

WET has obtained budget quotes for the prefabricated building structures, the coffer dam and platforms. Therefore, over 50% of the overall total is supported by a budget quote.

Two quotes were received for alternative coffer dam arrangements of EUR 9.7m and EUR 6.9m. The capex summary has USD 7.59m (or EUR 6.9m) as WET has determined in conjunction with the quotes provided by the supplier that only the lower cost option is required as a 2m high berm will be installed by WET, negating the requirement for the more expensive option.

The building footprints have been estimated by the Company and a quotation received from a reputable supplier. For all other civil, structural, electrical and other utilities requirements, the Company has included for a cost allowance.

Kawasaki in conjunction with Bank of Japan will arrange separate financing for the Cogen power plant. Effectively the Co-gen Plant will be run as a standalone project and the capital costs of the Co-gen Plant are incorporated in the unit cost for power and steam. Kawasaki has provided a budget quotation to satisfy the demand requirements as identified by the Company.

### 15.2.6 SRK comments

In relation to the project infrastructure covered in this chapter:

*General*

The Company has prepared a consolidated financial model with capital and operating costs where quotes and other line items are captured. A scaled site plan has been developed showing the location and sizing of ancillary infrastructure buildings.

*Ground Conditions*

Most of the underground pipework and cabling has been removed over the past 15 plus years since full plant closure and WET has levelled the buildings already. As WET are not required to remove the foundations, only to level the site WET has taken the approach that the foundations will only be removed where they interfere with new foundation requirements. The existing foundations will act as a solid base for the future industrial platforms needed for the process. Services will generally be overhead on pipe bridges and the only interference will be in underground drainage channels.

As no site-specific ground geotechnical investigation for infrastructure have been undertaken to date as the focus has been on the extraction and processing elements to prove the concept. In this case, because the ground is likely to be so variable and the site is relatively small, a preliminary ground investigation isn’t likely to have assisted in defining all the risks or increasing cost accuracy as whole; a more cost effective approach was adopted to commit significant resources at the next stage to provide sufficient definition for FS design, which is what is envisaged; in the absence of information a sufficient continency should be applied.

*Buildings*

The company has obtained a budget quote for the buildings based on sizing estimated for the function of each building, which is enough for a pre-feasibility study. The resulting cost per area seems reasonable. The costs for buildings that were added later have been later derived from the quoted cost per area rates. The prefab building costs account for construction above the top of foundation. For other civil engineering and construction works around the buildings a cost allowance has been included.

*Other Ancillary Infrastructure and Utilities*

Although there are no conceptual design, drawings or quantities, the Company has considered what else is required around the buildings and included a cost allowance for these items. Although no specific gaps have been identified during this review there is a risk that gaps will be identified once more detailed concept development and engineering takes place. Given the size and scale, the cost allowances appear reasonable.

*Sheet Piling / Coffer Dam*

There appears to be a broad understanding of the likely ground conditions beneath the site and which has informed the concept design of the sheet pile wall to get pile lengths. Nevertheless, the ground conditions and material properties remain relatively unknown and is a risk area. In addition, made ground at surface hasn’t been profiled (former concrete foundations, utilities, contamination area etc) which would further complicate things. The sheet piles are designed for maximum probable flood (1:1000 year) as based on the current hydrologic understanding.

- There is still uncertainty on the hydrology and hydraulics to be clarified in the next phase.

*Co-generation plant*

The schedule of requirements for power, heat and steam appears appear suitably detailed (note: the numbers have not been checked as part of this project infrastructure review). The budget quote provided by Kawasaki is a good start point for the cost included in the financial model. As WET will operate the Co-generation plant itself via a separate company an agreement on intercompany transfer charging will need to be put in place to ensure efficient taxation structuring.

*Cost Estimation*

Although the Company considers the various allowance for capex line items to be conservative, the contingency level at 10% where no quote is available is considered low, the level of engineering developed, which reaches a PFS level where some preliminary basis is determined and a budget quote or benchmark is used, although a significant amount of investigation and design work is yet to be carried out. We would recommend 20% is added to all line items recognising it's a brownfield site in a relatively populated area.

*Risks & Recommendations*

In a future construction phase, the typical construction risks will be complicated by the brownfield nature of the ground (buried services, old foundations, made ground) and further complicated by the risk of soil and groundwater contamination, contamination hot spots have been identified and their remediation has been allowed for within the TEM. The potential for additional cost associated to remediation and health and safety is not defined and cannot be underestimated and therefore we recommend that the contingency should be increased to 20% and should be applied in recognition that some of the allowances have inferred contingency in-built.

As is planned, a detailed ground investigation is required for the site and the coffer dam to define risk and costs.

The Company needs to carefully consider what is required at Feasibility Study level to produce a robust cost estimate taking account of material supply, equipment hours and rates, labour rates and productivities for equipment usage, construction and erection works. A bill of quantities for materials needs to be defined and multiple budget quotes obtained. Ground works and the coffer dam likely need to be advanced to request for tender stage.

Given there is a significant amount of engineering to be undertaken and the inevitable challenges and additional costs that will associated to construction management, the EPCM allowance of 8.510 % included in the economic model has been modified on SRK's recommendation (from 8.5%) and is deemed to be sufficient.

# 16 TRANSPORT AND LOGISTICS

Potential logistics scenarios to transport the anticipated quantities of reagents and consumables required supporting the proposed project are still being explored.

# 17 MARKET STUDIES AND CONTRACTS

## 17.1 Chromium

Chrome green oxide is the chromium product and there are currently no producers in Europe. This results in 100% imports from Lanxess in South Africa, Elementis Chromium (US) or Chinese product (numerous smaller players) and to a lesser degree small quantity are coming out of India.

WET therefore sees the opportunity to supply into the EU market using a qualified trader and has engaged in discussions with Possehl Erzkontor GmbH & Co. KG, in respect to establishing a long-term agreement for sales and marketing of the WET chromium and magnesia products.

WET have proposed a price of USD 4,582/t in their cash flow model. This is derived from the "Global and Chinese Chromium Salt Industry, 2017 Market Research Report", Prof Research, published June 2017. Representatives from Possehl Erzkontor have indicated the pricing used is in line with the current market.

In addition, WET has been approached by representatives of Harbison Walker International, the US's largest refractory products producer who made it clear that they would be interested in the chrome green oxide product. They expressed interest in the entire estimated 8,000 tpa proposed production.

## 17.2 Magnesium

Electrical grade fused magnesia (EFM >98.5% MgO) is the magnesium commodity, as EFM is seeing strong growth as the refractory sector gravitates towards FM and away from high purity magnesium oxide. EFM is used in high temperature applications and has been growing in demand but largely remains unfulfilled due to the challenges in producing this product by traditional methods. In contrast, the high purity precipitate process proposed is well suited to producing this product.

EFM attracts a higher price point ranging between USD 1,500-2,450/t ex works in the EU and USD 1,700-2,500/t ex works in the US market. Therefore, a price of USD 1,850/t is used in the Company's cash flow model.

Representatives from Possehl Erzkontor have indicated the proposed pricing is readily achievable within the current market, and moreover have indicated that they see opportunities to further develop into specialty fields with their customer base.

## 17.3 Calcium

Anhydrous calcium chloride is the calcium product and is heavily used in de-icing of roads (some 44.9% of the world market). Demand within the Romanian market has increased in the past few years as the CNADR (national roads authority) has been phasing out use of salt in line with EU recommendations. Growth of use of calcium chloride is expected to be around 5.9% CAGR through to 2023 and around 5.25 million tonnes in 2018.

Romania currently imports all of its calcium chloride used for de-icing and WET would be able to participate in the local tenders which are held annually by the various public authorities. Tender prices from 2016 and 2017 have achieved pricing for 33% hydrated product of USD 352/t and for 77% anhydrous product of USD 422/t. WET have proposed a price of USD 300/t in their cash flow model.

WET has also had discussions with an Austrian trader who supplies his local market with its demand, which is used for forestry track/road dust control in addition to de-icing in winter. The trader expressed interest in contracting the full circa 90,000 tpa of product which they currently sourced from the Netherlands (NedMag) and/or Sweden (Tetra Chemicals), in conjunction with other spot purchases.

## 17.4 Ammonia

Liquefied ammonia is a by-product of the process. Ammonia is industrially produced by the Haber Process, in which hydrogen and nitrogen are combined, the nitrogen coming from air and hydrogen from natural gas. As such the natural gas price is reflected in the ammonia pricing. It has risen by 9.4% since April 2019 and futures are indicating a further 10% by October 2020. Ammonia pricing is heavily tied into the Dutch TTF Natural Gas USD/MMBtu Futures market.

SRK have used a price of USD 180/t in their cash flow model. WET has assumed sales of the liquid ammonia locally to the Ameropa owned fertiliser plant Azomures located in Targu Mures, some 60 km from their site. Azomures currently produces liquid ammonia for its own use in fertiliser production via conversion of methane from the Romanian gas grid. WET has selected the price to ensure it is a competitive option for sale to Azomures.

In addition, WET is also investigating the sale of the liquid ammonia to Chimcomplex which plans to investigate restarting their mothballed ammonium chloride plant and potentially supplying that reagent to WET. This requires further exploration at this time which WET will follow up on in early 2020. Other than Azomures, which produces solely for its own or group consumption, no other ammonia is produced in Romania.

# 18 ECONOMIC PARAMETERS

## 18.1 Introduction

The Company has provided SRK with their cash flow model, which details production, operating costs and capital expenditure and is deemed to be sufficient for a PFS level of study. Whilst no Ore Reserve Statement has been declared, preliminary results of SRK's summary model have been presented herein, based on the assumption that the entire Mineral Resource has to be reclaimed and processed. SRK notes that the Company's model is post-finance amongst other differences, and Net Present Value ("NPV") as presented therein is therefore not directly comparable with SRK's post-tax, pre-finance number.

SRK notes that it has incorporated a corporate income tax of 16%.

## 18.2 Production and Sales

Three main products will be produced directly from the feed material:

- Chromium oxide ($Cr_2O_3$);
- Calcium chloride ($CaCl_2$); and
- Fused magnesia ("FM").

In addition, ammonia will be produced as a by-product plus further $CaCl_2$ is recovered as an ancillary product from the lime fed into the system.

Life of operations is estimated at 9 years, processing on average 210 kt per annum. Processing parameters assumed are:

- Recovery of 77.4% $Cr_2O_3$ to final product;
- $CaCl_2$ equivalent is based on 1.98*CaO in plant feed, with a recovery of 63.5%; and
- Recovery of 64.0% MgO to a 94% MgO product, further upgraded to an assumed FM grade of 99+% MgO by applying a further 3% loss.
- Ammonia is estimated to be produced at an hourly rate of 3.6 tph, based on a plant throughput of 27.5 tph.
- Ancillary produced $CaCl_2$ is based on a fixed ratio of lime added to the process based on recovered $CaCl_2$ from the main feed, resulting in an additional 32% $CaCl_2$ produced.
- Production estimated over the 9 year life of operations is presented in Table 18-1.
- For commentary on sales prices, refer to Section 17. A summary of the sales products and associated revenue is presented in Table 18-2.

Total sales products estimated to be produced over the life of operations is presented in Table 18-1.

For commentary on sales prices, refer to Section 17.

**Table 18-1: Life of Operations Production**

| Production | Units | Total | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|---|---|
| Plant Feed | (t) | 1,920,094 | 245,050 | 207,440 | 205,843 | 232,581 |
| Feed Content | | | | | | |
| $Cr_2O_3$ | (t) | 96,282 | 13,111 | 10,651 | 10,180 | 12,830 |
| CaO | (t) | 448,187 | 60,542 | 50,853 | 49,963 | 54,615 |
| $CaCl_2$ Equivalent | (t) | 887,023 | 119,821 | 100,645 | 98,884 | 108,090 |
| MgO | (t) | 462,162 | 58,691 | 50,598 | 52,051 | 54,918 |
| Main Products | | | | | | |
| $Cr_2O_3$ | (t) | 74,555 | 10,152 | 8,248 | 7,883 | 9,935 |
| $CaCl_2$ | (t) | 563,401 | 76,105 | 63,925 | 62,807 | 68,654 |
| FM | (t) | 286,727 | 36,412 | 31,391 | 32,293 | 34,072 |
| Ancillary Products | | | | | | |
| $CaCl_2$ | (t) | 180,600 | RRT | 20,491 | 20,133 | 22,007 |
| $NH_3$ | (t) | 249,649 | 31,861 | 26,971 | 26,764 | 30,240 |
| **Production** | **Units** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** |
| Plant Feed | (t) | 261,952 | 219,214 | 211,501 | 212,024 | 124,489 |
| Feed Content | | | | | | |
| $Cr_2O_3$ | (t) | 13,790 | 10,728 | 10,066 | 9,485 | 5,442 |
| CaO | (t) | 55,607 | 50,075 | 49,088 | 48,414 | 29,030 |
| $CaCl_2$ Equivalent | (t) | 110,054 | 99,106 | 97,152 | 95,819 | 57,454 |
| MgO | (t) | 57,758 | 53,951 | 53,164 | 50,693 | 30,336 |
| Main Products | | | | | | |
| $Cr_2O_3$ | (t) | 10,678 | 8,307 | 7,795 | 7,344 | 4,214 |
| $CaCl_2$ | (t) | 69,902 | 62,948 | 61,707 | 60,860 | 36,493 |
| FM | (t) | 35,833 | 33,471 | 32,983 | 31,450 | 18,821 |
| Ancillary Products | | | | | | |
| $CaCl_2$ | (t) | 22,407 | 20,178 | 19,780 | 19,509 | 11,698 |
| $NH_3$ | (t) | 34,059 | 28,502 | 27,499 | 27,567 | 16,186 |

**Table 18-2: Revenue**

| Sales and Revenue | Units | Total | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|---|---|
| **Sales Volumes** | | | | | | |
| $Cr_2O_3$ | (t) | 74,555 | 10,152 | 8,248 | 7,883 | 9,935 |
| $CaCl_2$ | (t) | 744,001 | 100,501 | 84,417 | 82,940 | 90,661 |
| Fused Magnesia | (t) | 286,727 | 36,412 | 31,391 | 32,293 | 34,072 |
| $NH_3$ | (t) | 249,649 | 31,861 | 26,971 | 26,764 | 30,240 |
| **Revenue** | | | | | | |
| $Cr_2O_3$ | (USDm) | 342 | 47 | 38 | 36 | 46 |
| $CaCl_2$ | (USDm) | 298 | 40 | 34 | 33 | 36 |
| Fused Magnesia | (USDm) | 530 | 67 | 58 | 60 | 63 |
| $NH_3$ | (USDm) | 70 | 9 | 8 | 7 | 8 |
| **Total Revenue** | **(USDm)** | **1,240** | **163** | **137** | **137** | **153** |
| **Sales and Revenue** | **Units** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** |
| **Sales Volumes** | | | | | | |
| $Cr_2O_3$ | (t) | 10,678 | 8,307 | 7,795 | 7,344 | 4,214 |
| $CaCl_2$ | (t) | 92,309 | 83,126 | 81,487 | 80,369 | 48,190 |
| Fused Magnesia | (t) | 35,833 | 33,471 | 32,983 | 31,450 | 18,821 |
| $NH_3$ | (t) | 34,059 | 28,502 | 27,499 | 27,567 | 16,186 |
| **Revenue** | | | | | | |
| $Cr_2O_3$ | (USDm) | 49 | 38 | 36 | 34 | 19 |
| $CaCl_2$ | (USDm) | 37 | 33 | 33 | 32 | 19 |
| Fused Magnesia | (USDm) | 66 | 62 | 61 | 58 | 35 |
| $NH_3$ | (USDm) | 10 | 8 | 8 | 8 | 5 |
| **Total Revenue** | **(USDm)** | **162** | **141** | **137** | **132** | **78** |

## 18.3 Capital Expenditure

A summary of the project capital expenditure as estimated by the Company, with the following adjustments by SRK (already adjusted into TEM v47), is presented in Table 18-3:

- Additional USD2.5m contingency: USD2.5m for general site infrastructure items; and
- Additional USD2.125m for EPCM.

The Company projects the project capital to be expended over a period of 30 months, 2.5 years. Numbers in the below table are worked back from a start of operations in year 1, with construction assumed to start 2.5 years prior.

**Table 18-3: Project Capital Expenditure**

| | Units | Total | Year -2.5 | Year -2 | Year -1 |
|---|---|---|---|---|---|
| Site Works | (USDm) | 51.79 | 33.72 | 17.21 | 0.87 |
| Process Lines | (USDm) | 92.03 | 45.32 | 42.38 | 4.3 |
| Fees | (USDm) | 3.42 | 3.42 | - | - |
| Contingency | (USDm) | 17.58 | 4.51 | 10.55 | 2.53 |
| **Total Capital Expenditure** | **(USDm)** | **164.82** | **86.97** | **70.14** | **7.7** |

## 18.4 Operating Costs

Operating costs as presented in Table 18-4 are as estimated by the Company, with no further adjustments by SRK required as they are deemed to be appropriate. The two main cost items are plant reagents and power.

**Table 18-4: Life of Operations Operating Costs**

| Operating Costs | Units | Total | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|---|---|
| Excavation | (USDm) | 25.87 | 3.92 | 3.80 | 3.55 | 3.50 |
| General Costs | (USDm) | 48.56 | 6.03 | 5.22 | 5.48 | 5.75 |
| Reagents | (USDm) | 222.47 | 28.39 | 24.03 | 23.85 | 26.95 |
| Staff | (USDm) | 39.84 | 4.75 | 4.39 | 4.39 | 4.39 |
| Energy | (USDm) | 223.97 | 28.84 | 24.63 | 24.11 | 27.24 |
| General | (USDm) | 1.70 | 0.19 | 0.17 | 0.32 | 0.17 |
| Administration | (USDm) | 12.84 | 1.53 | 1.41 | 1.41 | 1.41 |
| Closure | (USDm) | 4.95 | 0.46 | 0.43 | 0.43 | 0.43 |
| **Total Operating Costs** | **(USDm)** | **580.31** | **74.16** | **64.11** | **63.57** | **69.84** |
| **Operating Costs** | **Units** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** |
| Excavation | (USDm) | 3.60 | 1.85 | 2.03 | 1.90 | 1.73 |
| General Costs | (USDm) | 5.98 | 5.81 | 5.51 | 5.30 | 3.48 |
| Reagents | (USDm) | 30.35 | 25.40 | 24.51 | 24.57 | 14.42 |
| Staff | (USDm) | 4.39 | 4.39 | 4.39 | 4.39 | 4.39 |
| Energy | (USDm) | 29.99 | 25.84 | 25.32 | 22.81 | 15.19 |
| General | (USDm) | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| Administration | (USDm) | 1.41 | 1.41 | 1.41 | 1.41 | 1.41 |
| Closure | (USDm) | 0.43 | 0.43 | 0.43 | 0.43 | 1.50 |
| **Total Operating Costs** | **(USDm)** | **76.29** | **65.29** | **63.77** | **60.97** | **42.30** |

## 18.5 Summary

An assessment has been conducted on the Client supplied TEM v47. SRK's assessment has included Corporate income tax included at 15% and the model has been assessed based on pre-finance, real terms. SRK notes that no Mineral Reserves have yet been declared for the project and the economic assessment presented herein should therefore be considered preliminary.

A summary of the key economic parameters for the project are as follows (Table 18-5) at the Company's base 6% discount rate (real money terms). An NPV sensitivity to discount rate is presented in Table 18-6.

**Table 18-5: Key Economic Outcomes**

| Summary | Units | Value |
|---|---|---|
| Revenue | (USDm) | 1,215 |
| Operating Costs | (USDm) | (580) |
| EBITDA | (USDm) | 634 |
| Corporate Income Tax | (USDm) | (80) |
| Capital Expenditure | (USDm) | (165) |
| Net Free Cash | (USDm) | 390 |
| NPV (6%) | (USDm) | 219 |
| IRR | (%) | 28% |

**Table 18-6: NPV Sensitivity to Discount Rate**

| Discount Rate | NPV (USDm) |
|---|---|
| 2% | 322 |
| 4% | 266 |
| 6% | 219 |
| 8% | 180 |
| 10% | 147 |

# 19 ENVIRONMENTAL CONSIDERATIONS

## 19.1 Introduction

The project is located in the Mures county, Transylvania, central Romania (Figure 19-1). The city of Târnăveni is approximately 1 km north east of the waste dumps, Dambau is 2 km north west and Adamus is 1.75 km south west (Figure 19-2).


**Figure 19-1: Location of the project within Romania**

Outside of the main industrial area the main land use appears to be agriculture on the flood plain with residential land use along the two main roads. The primary roads are the 14A heading south to north from Medias to Targu Mures and the 107 heading east to west from Târnăveni to Blaj. The Târnăva Mica River flows directly south of the project site. A small tributary of the Danube, the Târnăva Mica River runs from east to west before joining the Târnăva River.

The nearest protected area is ROSPA0041 Eleşteele Iernut-Cipău (Iernut-Cipău Ponds), a bird protection site, located approximately 11 km north and ROSCI00384 Târnava Mică located approximately 6 km east of the site.

WET has conducted several studies on technologies to process contaminate material stored in WSF 2 and 3 with a view to recovering commodities of chromium oxide, magnesium oxide and calcium chloride. The waste dumps will be closed by exploiting and processing the material (see processing section of report Section 14) resulting in making the site safe and chemically stable.

WET obtained ownership of the land through sale purchase agreement no 598/20.042012. However, waste dump 1 which contains only carbide processing waste and is formally closed is jointly owned by WET (40%) and Teren Holding S.R.L, formally Carbid Fox (60%). By taking over ownership of waste dumps 2 & 3, WET also took over responsibility to make the waste dumps 2 & 3 safe, however WET has chosen the route to decontaminate via reprocessing the assets of the former owner and in the process removing the majority of the hexavalent chromium contaminant from the final waste.


**Figure 19-2: Location of project site on the former Bicapa chemical works**

## 19.2 Romanian Regulatory Requirements and Permitting

European Union (EU) legislation has been transposed into Romanian law and the regulations reflect the UN-ECE 1991 Convention on Environmental Impact Assessment in a Transboundary Context (the ‘Espoo Convention’) and the 1998 Aarhus Convention concerning access to information, public participation in decision making and access to justice in environmental matters.

Pursuant to Law 211/2011, any establishment or undertaking carrying out waste treatment activities must obtain an environmental permit or integrated environmental permit.

The project is classified in the category "Hazardous waste landfills or plants for hazardous waste disposal by incineration or chemical treatment", of Annex 1 "List of projects subject to environmental impact assessment", of No. 445/2009 on environmental impact assessment (EIA) of certain public and private projects. Government Decision no. 349/2005 provides for the suspension of waste dumping at Bicapa on 31 December 2006 and their closure according to Table 5.5 “Hazardous industrial waste dump sites that suspend/cease storage by 31 December 2006”.

In 2013, WET received an environmental permit (no. 2/25.07.2013) to demolish the fixed assets located on the project site. This demolition was primarily for safety and security on the site as well as removal of redundant buildings which would have required extensive guarding costs. WET are currently in the process of completing an EIA and beginning the permitting process to obtain environmental approval for the second stage of work 'to construct a coffer dam for definitive closure by exploitation and with the recovery of useful components of waste dumps 2 and 3 of the former Bicapa chemical facility'.

### 19.2.1 Relevant government approvals, permits and agreements

SRK understands the primary permit approvals required for the project are as follows:

- National Commission for Safety of Dams and Other Water Engineering Works – obtained from the Central Committee for approval of documentations assessing the safe operation of dams (CONSIB).
- Certificate of Urbanisation – Building authorisation obtained from the Târnăveni Municipality to undertake construction works.
- Water permit – Obtained from the Mures Water Basin Authority.
- Environmental permit – Obtained on submission and approval of an EIA report from the Ministry of Environment and Climate Change.
- Integrated Pollution Prevention and Control (IPCC) – Requires the environmental permit to consider the whole environmental performance of the project, including emissions, energy efficiency, prevention of accidents and rehabilitation. The permit conditions include emission limit values and ensures the public have the right to participate in the decision-making process.

SRK has been provided with numerous permits in Romanian and English. A summary of the key approvals, their validity and conditions are summarised in Table 19-1. There are several permits currently being applied for the project.

**Table 19-1: Current project permits**

| Name | Details | Conditions of approval |
|---|---|---|
| CONSIB Approval no 100/22.12.2017<br>**VALID**, (expires 2023) | Approval of the technical expert report assessing the safe closure and operation of waste dumps no. 1, 2, 3 Bicapa -Târnăveni | • collection of surface water from precipitations and draining thereof outside the waste heap area, in order to avoid formation of gullies that may lead to local instability of the former retention dam;<br>• protection of waste heap surface from the winds that may sweep away the waste heap material;<br>• restoring the geometry of the waste heap (levelling, slope reconstruction, etc.);<br>• restoring the protection of dams to prevent flooding from Târnava Mare river in the storage area;<br>• the beneficiary will monitor the evolution in time of the pits according to a monitoring project and will prepare annual reports until complete clearing of stored material;<br>• special attention will be paid to drainage of precipitation water from the surface of the pits, in particular where the stored material is to be recovered; |
| CONSIB Approval no 100/22.12.2017<br>**VALID** | Approval of the Inspection report for Bicapa-Târnăveni Storage Facility. Post-utilization closure project, feasibility study stage, for the waste dumps no. 1, 2, 3 and of the settling tank – safe operation agreement for engineered technical solution (Scenario no VI) | • construction of a new storage facility for hazardous waste, following the processing of materials existing in the storage facility, on the location of settling tanks no. 2 and 3, and partially of settling tank no. 1, with defence works against floods and reclamation related to the location of the future factory.<br>• existing contour dams consisting of local materials shall be kept and modified according to the new levels that provide the storage capacity requested by the beneficiary, as well as protection against floods;<br>• partition dams between the new bays will be made of the material resulting from the processing of material currently existing in the storage facility.<br>• The storage facility will include 12 bays with a total capacity of approx. 840,000 $m^3$; |
| Certification of Urbanisation Approval<br>no 98/10.05.2017<br>**Superseded** | Construction of cofferdam and industrial installations for the purpose of closure by exploitation and recovery of useful components | • permitted use with conditions including avoiding pollution of any kind<br>• the use of shiny sheets to cover buildings is prohibited;<br>• obtain environmental authorisation prior to construction, in accordance with the EIA Directive 85/337/CEE<br>• ensure public participation in the process<br>• Certificate is valid for 12 months from date of approval |
| Certification of Urbanisation Approval<br>No 55/15.04.2020<br>**Renewed 15/04/2020** | Closure of Bicapa-Târnăveni waste dumps 1,2,3 via exploitation (Stage 1) | |
| Water Permit<br>Nr 45/Mar 2020 Valid for the life of the project if project begins within 24 months of permit being approved - | Closure of Bicapa-Târnăveni waste dumps 1,2,3 via exploitation (Stage 1) | • respect the conditions of CONSIB<br>• monitor groundwater quality from at least 3 boreholes (one being upstream of the facility and 2 downstream relative to groundwater flow) during execution of work and then annually for the post closure monitoring period<br>• take measures to avoid pollution and prevent hydrocarbon spills |
| Environmental Approval no 9/9.11.2009 | Environmental approval concerning closure of waste dump 1 | • Closing and greening sump no. 1, measure with a deadline for completion set for December 31st, 2009 and December 31st, 2011 respectively if the sludge is recycled. |

| Name | Details | Conditions of approval |
|---|---|---|
| **VALID** | | • Post-closure monitoring of the dump sites for a minimum period of 30 years.<br>• Applying for and obtaining the Environmental Permit for the closure of the dump sites. |
| Environmental Approval no 4231/11.01.2010<br>**VALID** | Environmental approval concerning closure of waste dump 2 and 3 | • Closing and greening sumps no. 2 and 2 according to the closure project, measure with a deadline for completion set for December 31st, 2011.<br>• Entering the location of the closed dump sites in the cadastre register" (sumps 1, 2 and 3, Area = 30 ha), measure with a deadline for completion set for June 30th, 2012.<br>• Post-closure monitoring of the dump sites for a minimum period of 30 years.<br>• Applying for and obtaining the Environmental Permit for the closure of the dump sites.<br>• Improvement of the quality of the soil contaminated with Cr, Zn, Hg, Cd on the premises of the company.<br>• Preparation of a feasibility study and a technical project for cleaning, remedying and/or performing the ecological reconstruction; disposal, under the law, of all waste categories existing on site.<br>These tasks are out of date and will be superseded by the permit resulting from the ongoing EIA. |
| Environmental Permit no 2/25.07.2013<br>**VALID** | Decommissioning of buildings on the Bicapa-Târnăveni site | Works generally complete. Remaining works needed would be covered within the new Construction permit for the future processing plant. |

## 19.3 Social Licence to Operate

SRK understands the company has conducted stakeholder engagement with authorities and the local community as part of the EIA process (EIA stakeholder engagement). As part of the environmental permit application (No 2/25.07.2013) to demolish the buildings on the site, the company notified the public of their proposed plans for the site through publications in newspapers, on the local authority website and at the Târnăveni Town Hall in 2013. Public debates were held on the EIA for demolishing the buildings in 2013 and the decision to approve the environmental permit was published in the local newspaper, on the local authority website and displayed at the Târnăveni Town Hall. SRK understands the same process will be followed and the same stakeholders will be consulted during the next environmental permit application.

SRK notes that no formal stakeholder engagement plan (SEP) or strategy has been developed for wider project engagement. One is not required at this site as it is an industrial plant rather than mineral excavation but WET intend to initiate one during the design phase and prior to starting construction. Wastes Ecotech S.R.L do have small number of staff on site in the pilot plant, however, do not have a formal method for recording and managing grievances.

## 19.4 Closure

S.C Geocons Expert Proiect S.R.L were commissioned by WET in 2016 to identify a feasible solution to close the existing waste dumps. Once the waste has been processed and stored in a new hazardous waste facility, the waste dumps will be covered with 0.3 m layer of fertile soil and grass. According to the 2016 feasibility study, closure of the waste dumps following processing will involve installation of a bentonite geo-composite layer, a HDPE geomembrane layer, drainage channels and covering with soil and grass. The total cost to close the three dumps is approximately 5,000,000 EUR. This excludes retrenchment costs of the 270 or so staff employed during the project.

According to Article 12 of Decision 349/2005 the operator of the dump site has the obligation to establish a fund for the closure and post-closure monitoring of the dump site. The Fund is constituted within the limit of the amount laid down by the closure and post-closure monitoring project of the dump site and is realised by annual instalments of the amount.

The fund is used up based on progress reports drawn up as the works are performed, upon closing a dump site or a part thereof. The operator uses the envisaged funds constituted for this purpose based on the supporting progress reports.

The landfill operator is responsible for the maintenance, supervision, monitoring and post-closure control of the dump site, as per the Environmental Authorisation. The post-closure monitoring period is determined by the competent environmental authority and it is at least 30 years, with the possibility of extension if it is found that the dump site is not stable.

The costs incurred for the post-closure monitoring of the dump site for a period of 30 years have been estimated as 243,000 USD/year, this is included in the TEM and this exceeds the legal requirement which only covers water quality monitoring. Funding post 30 years (if it is deemed to be required) has not been accounted for.

## 19.5 Risks and Opportunities

Based on the information provided, SRK have identified the following risks and opportunities:

- Permitting timescale – WET have stated that they will maintain adherence to the Romanian legislation in force at all times, they have assurances from the Regional and State bodies that the project will be fast tracked whenever possible. However, the permitting strategy for the project is unclear and some of the permits provided to date have expired. SRK has been provided with estimated timescales to obtain the IPPC and environmental permit approval (including EIA report). The current estimate is 168 days for the IPPC and 197 days for the environmental permit. This includes extensive public consultations as required by EU law. This may mean the permitting schedule is not aligned with the overall project development schedule and may result in project delays if not managed continually.
- Compliance with existing permits – As demonstrated in Table 19-1, the company already has an extensive list of permits, but the status and obligations contained within each are not being actively managed. It is unclear how the company is complying with its existing permit obligations or tracking when permits require renewal.

- Whilst it is acknowledged and it should be commended that during post closure any contaminated water emanating from site will be treated through a dedicated IX water treatment plant, the disposal route for chromium(VI) enriched resins needs further work and may become a challenge if the disposal route becomes unavailable during the 30 year post closure operating period.

The project presents an opportunity to remove contaminated waste and produce valuable products while responsibly closing a polluting legacy site.

# 20 HYDROGEOLOGY AND HYDROLOGY

## 20.1 Summary of the Site Hydrology and Hydrogeology

The existing site is located adjacent the Târnava Mică River, within the river's flood plain. A disused flood water dam system is situated downgradient of the site.

The alluvial aquifer system aquifer typically comprises a mixture of silts and clays or silts mixed with sand lenses in the upper part (top ~6m), and typically sand and gravel below ~15m deep. This overlies a clay/marl basal formation, which is taken to be of very low permeability in reports commissioned by the client. The phreatic water level is typically ~2 to 5m below ground surface (mbgl) in the alluvial deposits and is understood to be influenced by the river (i.e. gaining and losing depending on river levels).

The main development area of the existing site consists of 3 existing waste dumps (WSF 1, 2 & 3 – with WSF not subject of this project) from the former chemical works which are separated from the river by a 12m deep low permeability concrete slurry wall. The base of the existing waste facilities is formed by an engineered barrier layer (EBL) of 'fines, muds and clays'. Lateral groundwater migration of seepage from the dumps around the slurry wall, or beneath the slurry wall towards the River, is not prevented.

The remaining area of the client's site comprises a former plant area which is not proposed for any further development. Contaminants are also reported as being mobilised from the former plant area to groundwater.

The principal contaminant of concern in the waste in terms of concentration and toxicity is chromium 6+ relating to the sodium dichromate waste in WSF 2 and 3. Other contaminants of concern include the heavy metals chromium 3+, mercury, cadmium, zinc, nickel and sulphate.

The assay coring revealed limited penetration of the chromium into the underlying clays in the waste areas, therefore it has been suggested that downward vertical migration is unlikely to be a principal route in the waste sump areas. More extensive soil sampling of wastes was conducted by F&R Worldwide (and plotted by AMS) on behalf of the client across the former plant area in 2018 revealing widespread concentrations of total chromium exceeding regulatory 'intervention levels' (based on Environmental Pollution Regulation 756/1997), with zones of cadmium, sulphate and zinc also exceeding intervention levels. A 3rd round of sampling is planned to be carried out in the next phase to help clarify further the contaminant zones.

The extent of the groundwater contaminant plume emanating from both the waste and former plant areas within the clients site boundary is poorly defined as no investigation has been undertaken to date. There are three groundwater monitoring boreholes located outside of the client site between the site and the river, and a fourth well located in the boundary of the client's site. All these wells have screened zones extending across the deeper alluvial aquifer. No monitoring facilities have been installed in the upper part of the alluvial aquifer system. Samples have been collected from these wells twice yearly in most years since 2005. The groundwater analysis shows chromium and sulphate migration in the deeper analysis above permissible regulatory limits, however, the water sample analysis appears to omit cadmium, mercury and zinc, which have been observed as elevated in soils analysis. SRK understands that a comprehensive groundwater site investigation to delimit the extent of the plume within the client site and assess its migration is planned but has yet to be commissioned.

There is an old landfill directly to the west and downgradient of the WET site, outside of the ownership boundary. The area is industrial and other sources of groundwater contamination may be present outside the ownership boundary.

## 20.2 Planned Development in Relation to Water

The re-processed wastes will be backfilled in a hazardous category landfill in the former waste dump location. The area will be re-engineered with an HDPE liner placed over the existing EBL. The proposed cover is a geo composite (bentonite and HDPE). The steel sheet piling (SSP) surrounding the active area will be installed to 15m depth to intercept the underlying basal clay/marl formation with 6m of sheeting left above ground to act as a flood wall. The purpose of the sheet piling is therefore two-fold: to contain contaminated groundwater within the active part of the site ownership area during waste reprocessing and to reduce flood risk from the Târnava Mică River to site.

The remaining ownership area, comprising the areas around the former chemical plant, will not be contained by the sheet piling, although the former plant footprint will be contained within the dam. WET have stated to SRK that they are liable for soil remediation of this area to regulatory standards. WET propose to excavate areas of exceedance based on soil testing and place material into some of the latter landfill cells in the process area. WET have completed two of the three steps required in the assessment regarding the soil volumes required for removal and placement with further investigation planned during site development.

Pumping wells will be installed inside horizonal drains within the area contained by sheet piling to maintain groundwater levels at similar levels to natural levels outside the piling-contained area (i.e. to prevent infiltration causing groundwater level rise inside the piled area). A detailed assessment of the water volumes to be pumped has not been undertaken by WET to date.

Non-waste dump areas inside the sheet piling area will remain open to infiltration. Areas outside the sheet piling area will also remain open to infiltration (although it is noted that many areas currently contain legacy hardstanding which will remain in place if practicable). Perimeter channels will be used to control rainfall over the dump area and other active areas inside the sheet piling area during works to both minimise infiltration and control contaminated water in active areas, which will be directed for water treatment. No detailed plan has been developed but drainage channels are assumed in the roading, parking etc areas which feed to a drainage and filtration system as marked on the site plans. two system will be operated – inside the coffer dam and outside the coffer dam.

Fresh water supply is to be obtained from the Târnava Mică River. Mobile flood gates are to be reinstated on the existing downgradient flood dam in the Târnava Mică to impound water at variable heights and facilitate the abstraction of greater volumes in the dry season. The replacement flood gates have been designed and the electrical / mechanical sections remain to be designed for the new flood gates. Water obtained from pumping inside the sheet piling and surface water will be treated and either retained for usage or, if surplus to requirements, discharged to the Târnava Mică River.

For the monitoring of groundwater emissions from the site it is understood that regulators have specified 5 monitoring wells; 1 upstream and 4 downstream of the planned facility. The existing wells appear to have been drilled and equipped with well lining in this regard.

The flood risk assessment for the site is based on a hydrological review of flow records which covers the last 32 years, but it does not include climate change considerations. The Chezy formula has been used and US Army Corp of Engineers software HEC 4.1.0 was used in this study to develop a hydraulic model. The WET Dam function is principally for water capture for the plant and water attenuation on the river is done at the large collector basin upstream (some 80km) and at the town dam site. WET will be required to move the flood gates only if water flow is low and there is a need to regulate for supply to the process plant or if the Water Authority requests.

### 20.2.1 General SRK comments

*Groundwater*

Ground investigation has indicated extensive soil contamination with hazardous substances present. Groundwater contamination has been identified in the few existing deep alluvial monitoring wells and SRK considers that contamination is likely to be extensive in other areas, with shallow alluvial groundwater also potentially contaminated.

In the existing dump area, the site reclamation works should improve the long-term soil and water quality through both the reprocessing of the waste materials and improved waste storage facilities engineered to EU regulatory standards.

The requirement to remediate contaminated soils in the former plant area will improve soil quality and should improve groundwater quality long term. As the groundwater plume will be left in place, long-term infiltration management measures will be required, such as low permeability cover soils with surface drainage systems. Otherwise the remediator may be liable for pathway development and contaminant migration.

WET have stated they are not liable for existing groundwater contamination and that this falls to the state, however they will be liable for any contamination that is a result of their project. As, to date, there has been no detailed survey of subsurface groundwater contamination there is no measure (based on a comprehensive contaminated land baseline assessment) of what the State's responsibility is for clean-up. There is a risk that ongoing migration of existing pollution in the groundwater system could be seen as a result of WET's activities, even if such migration occurred without WET's intervention.

As a result of this risk, WET has obtained a proposal for the installation of 17 dual level monitoring wells for characterisation of the contamination plume, however this work has not yet commenced. SRK recommend that groundwater characterisation should to extend to all contaminants in the plume(s), should include an assessment of the natural migration of the plume(s) currently and an assessment of the risks/benefits of the various remediation and closure measures currently being considered.

WET intends to prioritise the placement of the monitoring wells as part of the next phase of the works. The law nr 211 requiring the 12 months of data collection was only passed through parliament on 16 March 2020 and hence WET expects that this prior data collection will not be required for issuance of the EIA but will require to be submitted to the EPA as soon as the data has been collected. WET have met with the Secretary of State in January 2020 and has his commitment to fast track the project and hence such prior data collection will not delay the project.

Groundwater management and treatment requirements for water inside the sheet pile contained area have been subject to preliminary estimates of volumes. A more detailed water balance is required after gaining field data with which to estimate pump and treat requirements.

*Surface water*

Whilst it should be noted that the responsible regulator in Romania (CONSIB) has accepted WET's flood risk assessment and a permit for the operation has been received, there are risks associated with flood plain definition and civil structure design that will require management in operations (river levees height and freeboard).

Surface water drainage has been planned for the process site and reclamation area. A clear plan for site drainage will be needed for the remaining existing plant area, for both during and post clean-up operations. This will be required to both contain surface contaminated surface water runoff and minimise increased infiltration.

Currently no surface water monitoring is being undertaken in the Târnava Mică River adjacent to the site. Therefore, there is no baseline record of upgradient river quality or existing contamination to the river. Existing drainage channels from the site should also be monitored when in flow to characterise baseline conditions.

## 20.3 Risks and Opportunities

A characterisation study and detailed management plan of the existing groundwater contamination plume is absent. There is currently a lack of monitoring well installations and groundwater monitoring data inside the site area. Statutory requirements to protect groundwater quality from worsening in the wider ownership area means that soil remediation costs could be greater than currently estimated (e.g. cover systems to reduce infiltration could be needed). Ongoing and future liabilities with respect to the management and monitoring of groundwater need to be clearly documented that they are the responsibility the State.

Whilst the responsible regulator in Romania (CONSIB) has accepted WET's flood risk assessment and a permit for the operation has been received. The flood defences have been established above the 1 in 1000-year prediction. However, a risk of more recent data in the assessment not being used could lead to variation in flood modelling and therefore, that flood related infrastructure is not appropriately designed. This will require further evaluation during construction to confirm initial predictions.

A high-level assessment has been made regarding soil volume for remediation (for planned excavation). Therefore, there is uncertainty regarding volumes and costs. There may also opportunities relating to the soil remediation of the plant area. It is possible EU funding could be obtained for such works. Additionally, alternative remediation strategies, such as in-situ stabilisation, may provide both soil contamination and infiltration concerns at a reduced cost.

# 21 CONCLUSIONS

This document is internally consistent at the time of publication of Friday 1st May, 2020 with the documents referenced herein. SRK is not responsible for any subsequent changes in the project scope or details.

Overall SRK is satisfied that the majority of aspects for the project have been defined to a PFS level of understanding. There are several exceptions to this including: environmental, social and hydrogeology.

SRK is satisfied that the geometry and grade of the deposit is well known. The density of the deposit has now been well established. The Mineral Resource has been classified as "Indicated" and SRK endorses the JORC accredited statement issued here. SRK consider that no additional work is required from an extraction or processing perspective in terms of the Mineral Resource Estimate prior to converting to Ore Reserves.

Given the high confidence implied by the results of the KNA and the resulting SoR model. The grade model alone allows the classification of the deposit as Indicated Mineral Resource under the guidelines set out by the JORC code (2012) and the PERC code (2017).

The drill spacing can be considered to be at the limit of reliability and if wider drilling had been used then it is likely that no useable semi-variograms could have been produced. Additionally, the use of 1m sampling vertically has had the beneficial effect of allowing the vertical variability to be well defined. Based on the above it is the Consultants opinion that the geological understanding of the deposit would allow the application of an Indicated category.

The Mineral Resource Statement for the Former Bicapa-Tarnaveni chemical works WSF is based on the results of the drilling carried out in 2013 and the subsequent test work conducted by WET and their consultants. The classification applied by the Consultant and reported in Table 11-1 is based on the Consultants understanding of the deposit structure and grade distribution as implied from the supplied drill hole database. Additionally, the Consultant has drawn on the information contained within the 2013 SRK report, specifically regarding the QAQC analysis of the check samples and duplicates. At the time of reporting, the Consultant has not carried out a site inspection and was not present at the time of the 2013 drilling programme.

The Mineral Resource Statement is reported at a 0.0% Cut Off Grade. The reasoning behind this is the fact that the company plans (and is actually required) to excavate the contents of the WSF in their entirety regardless of grade variations."

In terms of "reasonable prospects for economic extraction" the WSF meets the requirements to be mined in its entirety and the issue of whether it meets a "Reserve" comes down to whether certain areas or blocks fall below an economic grade when looked at in conjunction with their Cr(eq) grade which was calculated using the processing recovery and cost parameters provided by WET. That said, this is a fairly unique situation in terms of resource and reserve classification and thus the mineral resource can be considered equivalent to the mineable reserve.

The material is an atypical soil from a geotechnical perspective, further investigative works should be completed prior to finalisation of predicted equipment utilisations and detailed slope designs. The density of the contained materials is very low, and the behaviour may be atypical.

WET has provided detailed costs within TEM v47 which SRK consider to be appropriate for a PFS and the level of contingency is also deemed to be adequate.

Due to the challenge of transporting hexavalent chromium, limited international external analysis has been possible at present. Further development will benefit with construction of an on-site internationally accredited analytical laboratory.

# 22 RECOMMENDATIONS

There are several recommendations within each individual sub-section, however some of the major ones that should be developed for the next phase of the study are summarised in this section.

Conversion from an ore reserve from an indicated mineral resource would not be limited from an excavation and processing perspective, once the requisite permitting and environmental impact assessments are completed.

Most of the processing phases have been proven up to PFS level on a batch type pilot plant, however the chrome green conversion process is novel and has not been proven in the pilot plant.

Although proven technology fused MgO and ammonia have not been produced to final saleable products in the current testwork and this needs to be addressed in the feasibility study.

The extent of the current contaminated groundwater plume has not been established; this should be established during the next phase of the study to de-risk the legacy liability aspects of the project.

An emergency plan should be developed to be implemented if the clay liner is breached, in addition an emergency plan must be developed for category A hazardous waste facilities, these have not been developed to date.

A stakeholder engagement plan should be developed and implemented to ensure that any community concerns can be addressed, including managing expectations around employment opportunities.

An obligations and permit register should be developed to ensure that any commitments made to regulators and/or the community can be carried through to the implementation of the project, in addition to monitoring the expiry etc. of individual permits.

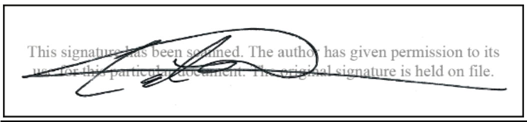
The hydrogeological studies that have already been scoped should be conducted, as an understanding around the extent and severity of the groundwater plume will enable the liability to correctly defined and de-risk the project.

Potential logistics scenarios to transport the anticipated quantities of reagents and consumables required to support the proposed project need to be explored in the next phase of the project.

Mitigation measures around chromium(VI) laden dust generation need to be further developed, backed up with dust dispersion modelling to ensure that communities and employees are adequately protected.

From the processing perspective the critical issue is the demonstration of chrome green production at semi-commercial/pilot scale; also, production of fused magnesia and demonstration of reasonable costs for production of both.

**For and on behalf of SRK Consulting (UK) Limited**





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# APPENDIX

# A MINERAL RESOURCES REPORT

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*Filename*: 1902.1_190315_Former_Bicapa_report_w_table1_r07.docx, [rev3]

# A REPORT ON THE MINERAL RESOURCES OF THE FORMER BICAPA - TARNAVENI CHEMICAL WORKS WASTE STORAGE FACILITY, ROMANIA

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# A REPORT ON THE MINERAL RESOURCES OF THE FORMER BICAPA - TARNAVENI CHEMICAL WORKS WASTE STORAGE FACILITY, ROMANIA

## 1 EXECUTIVE SUMMARY

The former Bicapa-Tarnaveni sodium dichromate production plant in Romania was operational for almost 50 years prior to closing in 2001. The current site encompasses the original waste storage facility (WSF) which contains chromite ore processing residues (COPR) consisting of residual hexavalent chromium, partially processed chromite ore and other waste products. During operation, the COPR was pumped as slurry into the WSF and dewatered. The reclaimed water was then returned to the processing plant. Wastes Ecotech Srl (WET) is currently assessing the viability of reprocessing the waste contained within the WSF with a view on recovering the chromium from the contaminated site as a saleable commodity with both magnesium and calcium as economic by-products.

The WSF has been drilled and sampled in 2013 by core and hollow stem auger methods on a regular 50x50m grid with sampling generally undertaken at 1m intervals. The Mineral Resource Estimation reported herein, is based on the results of this drilling. Analyses of $Cr_2O_3$, MgO and CaO were used to estimate grades into a 3D block model. In addition, a Chrome equivalent ($Cr_{(eq)}$)grade was calculated to highlight the contribution applied by including the MgO and Ca as by products in the process. The volume of material is based on the topographic survey of the upper WSF surface along with surveyed collar elevations of the drillholes. The base of the deposit is based on the intersection and identification of the clay liner along with the visible margins of the waste material.

The total contained material is reported here as 1.92Mt (based on dry density) at a grade of 5% $Cr_2O_3$, 24% MgO, 23.3% CaO and a $Cr_{(eq)}$ grade of 10.75%.

*Table 1-1. The former Bicapa - Tarnaveni chemical works WSF Mineral Resource Statement, March 2019*

| Domain | Category | Tonnes | SG | $Cr_2O_3$ % | MgO % | CaO % | $Cr_{(eq)}$ % |
|---|---|---|---|---|---|---|---|
| WSF | Measured | - | - | - | - | - | |
| | Indicated | 1,920,100 | 0.98 | 5.01 | 24.07 | 23.34 | 10.75 |
| | **Meas+Ind** | **1,920,100** | **0.98** | **5.01** | **24.07** | **23.34** | **10.75** |
| | Inferred | - | - | - | - | - | |

# 2 INTRODUCTION AND TERMS OF REFERENCE

## 2.1 Scope of Work

Dr John Arthur (The Consultant) was requested by Dr Matt Dey of Geochemical Engineering Solutions Ltd (GES) to assist in the production of an updated grade and tonnage model for the former Bicapa-Tarnaveni chemical works Waste Storage Facility (WSF). The WSF is currently being evaluated as a potential source of $Cr_2O_3$ by Wastes Ecotech Srl (WET) through reprocessing of the material contained within the facility.

The scope of work covered by this report details the methodology used and results from a Mineral Resource estimation exercise based on the results of the 2013 drilling campaign along with the surveyed domain wireframes and boundaries provided to the Consultant by WET.

### 2.1.1 Basis of Technical Report

The results of the work contained herein are reported using the guidelines set out in the JORC Code (2012). The JORC code is produced by the Australasian Joint Ore Reserves Committee ('the JORC Committee') and provides a mandatory system for the classification of minerals Exploration Results, Mineral Resources and Ore Reserves according to the levels of confidence in geological knowledge and technical and economic considerations in Public Reports.

Clause 41 of the 2012 JORC code states "***The Code applies to the reporting of all potentially economic mineralised material. This can include mineralised fill, remnants, pillars, low grade mineralisation, stockpiles, dumps and tailings (remnant materials) where there are reasonable prospects for eventual economic extraction in the case of Mineral Resources, and where extraction is reasonably justifiable in the case of Ore Reserves***".

## 2.2 Site Inspection and Reliance on other Experts

The Consultant has not carried out a site inspection and all data has been provided by WET and their consultants. The Consultant has drawn on the detailed knowledge of the site from Dr Matt Dey who has visited the site on numerous occasions. The Consultant has also had access to previous reports produced on the deposit which describe the drilling and sampling process in detail and provide a detailed overview of the QAQC information obtained from the sampling. This historical information dates to 2013 and is summarised in a report produced by SRK Consulting (SRK) titled "***A Grade Tonnage Estimate on the Contained Wastes at the former Bicapa-Tarnaveni Chemical Plant in Judet Mures, Romania***" (report # UK5355).

## 2.3 Disclaimer

The Consultant assumes all technical information provided during the course of its mandate to be accurate and constitute material disclosure. The Consultant will not provide an opinion in respect of legal matters including licence jurisdiction.

This report includes technical information, which requires subsequent calculations to derive sub-totals, totals and weighted averages. Such calculations inherently involve a degree of rounding and may introduce a margin of error. Where these occur, the Consultant does not consider them to be material.

The Consultant is not an insider, associate or affiliate of WET, and has not acted as advisor to WET or its affiliates in connection with the Project. The results of the technical work completed by the Consultant is not dependent on any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings.

# 3 GEOLOGICAL SETTING AND MINERALISATION

The source material for the processing of chromite ore at The former Bicapa-Tarnaveni chemical works was from undisclosed Chromite mining operations in Kazakhstan during the Soviet era. Material was shipped by train to the site for processing. The geology and specific mineralisation of the original ore is not known.

Between 1955 and 2001 Dichromate was the primary product. The resultant waste was stabilised with local dolomite brought in from Sfantu Gheorghe by rail cars and converted on site. Sfantu Gheorghe is located in Covasna County, Transylvania, approximately 190 km south-west of Tarnaveni.

Waste material from the ore processing facility was pumped as a slurry into two waste storage dams. Given the lack of information regarding the grade and mineralogy of the ore, the recoveries and the scheduling of waste disposal it is not possible to define a domain model within the WSF based on historical records.

The "geological" model on which the Mineral Resource statement is made is based on the grades of $Cr_2O_3$, MgO and CaO as sampled from the drilling of the WSF carried out in 2013. Although it is possible to define areas within the WSF where relatively higher and lower grades of the various products occur, the nature of the deposition as a slurry in shallow ponds and deltaic "beaches" gives rise to a series of very shallow (vertically thin) sequences which overlap and transgress. This makes it difficult to model individual domains within the WSF at a scale which would be appropriate for estimating separately, especially given the spacing of 50m between sample locations. As a result the WSF is treated as a single domain for the purpose of the Resource estimation exercise described herein. The domain boundaries therefore consist of the upper and lower topographic surfaces and the linear bunds which enclose the site.

The following images (Figure 3-1) show the WSF with and without the contained waste material and highlight the shallow nature of the deposit (average depth 12m).

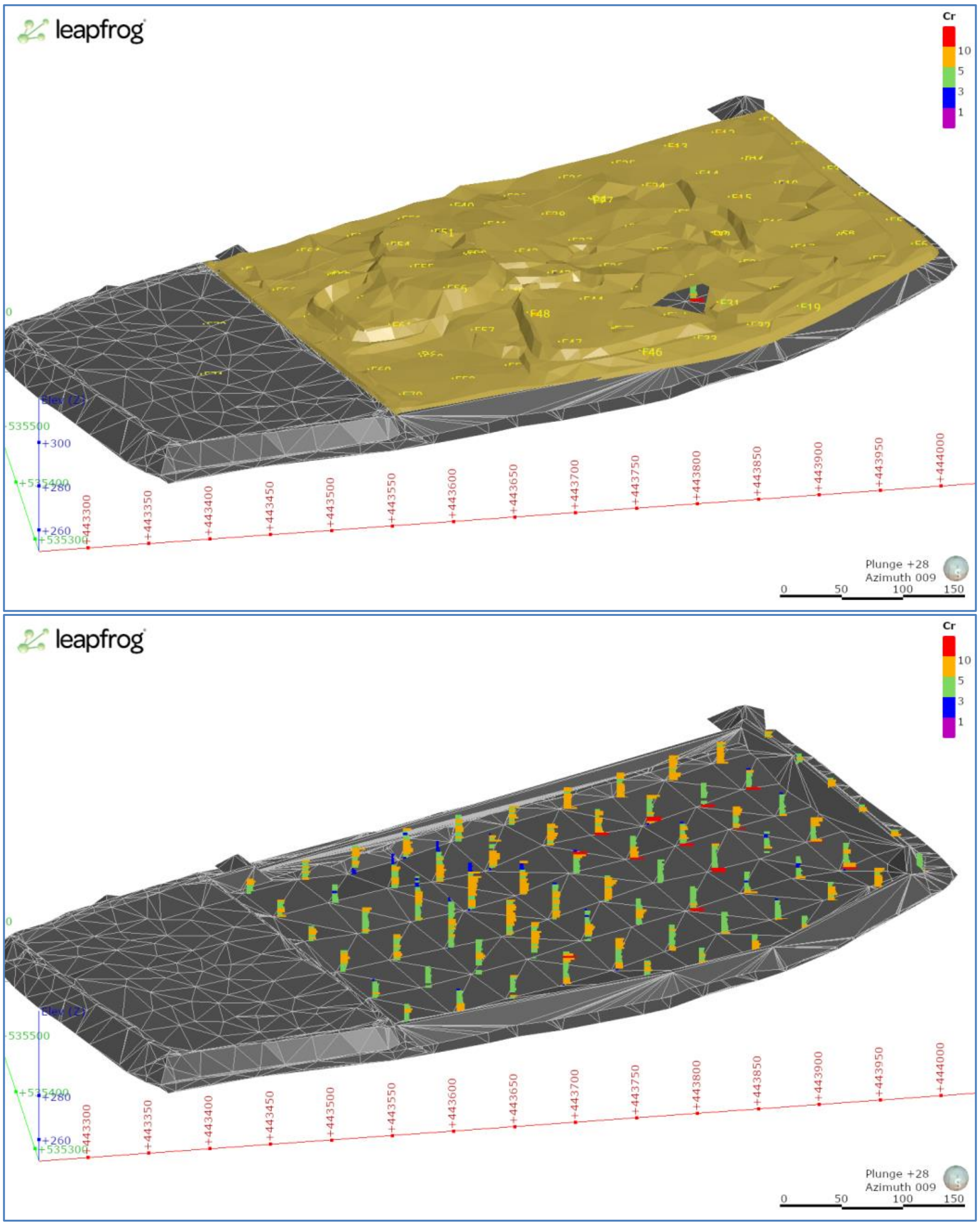



*Figure 3-1.* *Perspective view of the Former Bicapa-Tarnaveni chemical works WSF looking north-northeast showing the current surface topography (Upper) and the location of the 2013 drillholes with the waste material stripped away (Lower)*

# 4 MINERAL RESOURCE ESTIMATE

## 4.1 Introduction

The Mineral Resource Estimation for the Former Bicapa-Tarnaveni chemical works WSF was based on the assay data obtained as part of the 2013 drilling campaign. For this report $Cr_2O_3$, MgO and CaO variables were estimated along with dry density. The variables were estimated into a 3D block model based on a 8m x 8m x 4m parent block size covering the WSF.

## 4.2 Database Validation

The Consultant has carried out basic database verification on the data provided by the client. Details for a total of 71 evaluation holes and 8 density holes are contained within the presented database. Of the 71 evaluation holes a total of 64 are drilled within the main body of the WSF and it is the data derived from these holes which has been used for the current estimation exercise. Validation has consisted of checking for overlaps between adjoining sample intervals, duplication of intervals and holes and confirming that hole surveys are accurate. The Consultant has had no input to the project prior to this commission and was not involved in the previous resource Estimation exercise carried out in 2013. However, the report produced by SRK in 2013 has been made available and the data verification carried out by SRK has been reviewed and is considered appropriate allowing the data to be used for the reporting contained herein.

## 4.3 Domain Modelling

As outlined in Section 3 above, the deposit has been considered as a single domain for the purposes of the estimation carried out here. There are no identifiable hard physical boundaries, geological boundaries or grade boundaries which can be modelled within the WSF other than the upper and lower surfaces and the encompassing bunds and therefore these define the volume of the single domain. All estimation has been carried out within the global volume of the WSF.

## 4.4 Density Determination

### 4.4.1 Historical density estimation

During the 2013 investigation, 8 holes were drilled specifically for determination of density. Unfortunately these were drilled separately to the main evaluation holes and were only sampled for density it has therefore not been possible to carry out correlation between grade and density within the deposit from these holes.

Figure 4-1 shows the raw data histogram for the dry density values based on the results of testing by Laboratorul Geotechnic Translivania. Dry density values were established based on the calculation:

Dry density = Wet Density / (1+(Moisture content/100))

Within the dry density data there is a clear bi-modal distribution with some 25% of the data forming a sub-population with a mean of approximately 0.6 t/m$^3$. The main population accounting for some 70% of the data forms a normal distribution with a mean of approximately 1.0-1.1 t/m$^3$. Two outliers with values >1.5t/m$^3$ are not considered valid.

An issue lies in the fact that the dry density is calculated using the humidity values and these range up to values of 170% which is clearly untenable and points to the possibility that the humidity estimation carried out by the testing laboratory is based on a flawed methodology.

Figure 4-2 shows the locations of the density drilling samples within the WSF. It is clear that the lower density sub-population results are generally occurring in the eastern half of the WSF at the base of the deposit. The coherent distribution of these low density samples in adjoining holes and at the same general level within the deposit indicates that the sub-population should be regarded as a valid group of results within the larger population. It is also clear from Figure 4-2 that the majority of the higher value samples occur in one hole which is intersecting an elevated area of the WSF and it is likely that these represent a unique period of deposition within the WSF at this time.

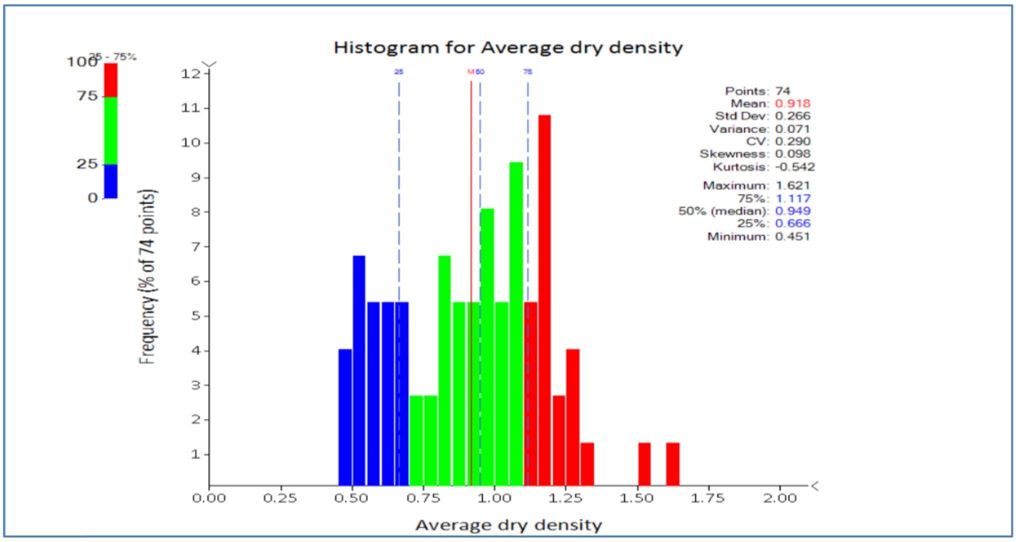



*Figure 4-1. Histograms of dry density obtained from 74 samples in 8 density holes*

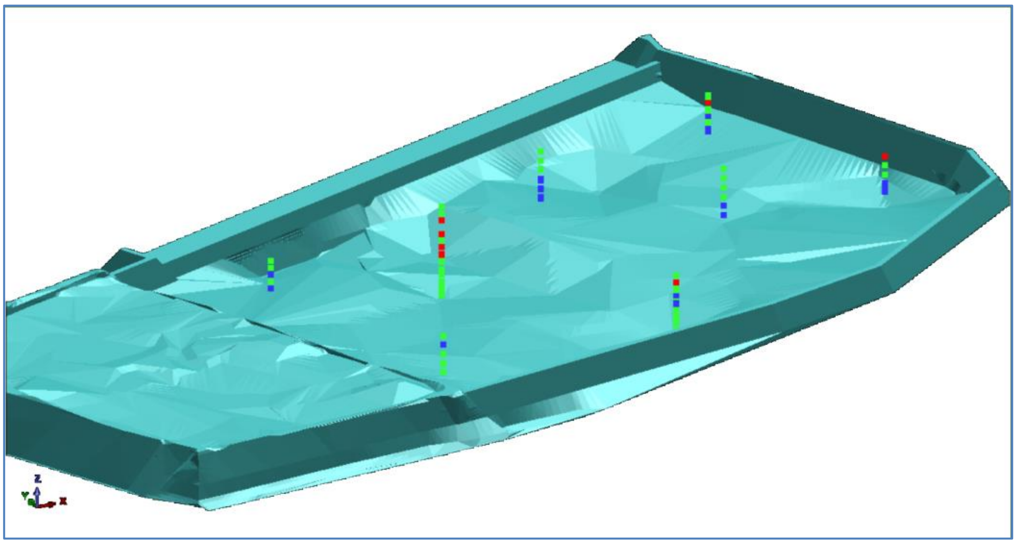


*Figure 4-2. Perspective view of the WSF showing the sample locations for density drilling data*

However, there are a number of issues with the density drill data, namely:

- The number of samples is low (74);
- The distribution of density holes is not regular across the site with only 8 holes drilled

(Figure 4-2);

- Density calculations assume a constant 100% recovery of the drill samples;
- The humidity values show values well in excess of 100% implying a problem with either the sample collection of the analysis.

### 4.4.2 Updated density determination 2019

As part of their audit of the 2013 report, SRK considered the density data to be a potential issue given the obvious problems with the humidity readings described above. It was therefore decided to use the density values calculated from the individual exploration drilling samples. The advantage of this data set was that the number of samples increased from 74 to 1076 and the distribution of the samples covered the complete area of the WSF on a regular grid.

The recovery values recorded in the assay database vary from 30% up to 100% with the majority of samples recording recoveries >90%. The density calculations initially assumed a recovery of 100% and the variable recovery was assumed to be due to compression of the sample during collection from auger barrel. However, the following plot (Figure 4-3) shows the scatterplot between the sample weights and recoveries subdivided into the 2 main drill diameters. There is a clear correlation between weight and recovery which implies that recovery is actually due to sample loss and therefore the recovery should be considered as part of the density calculations.

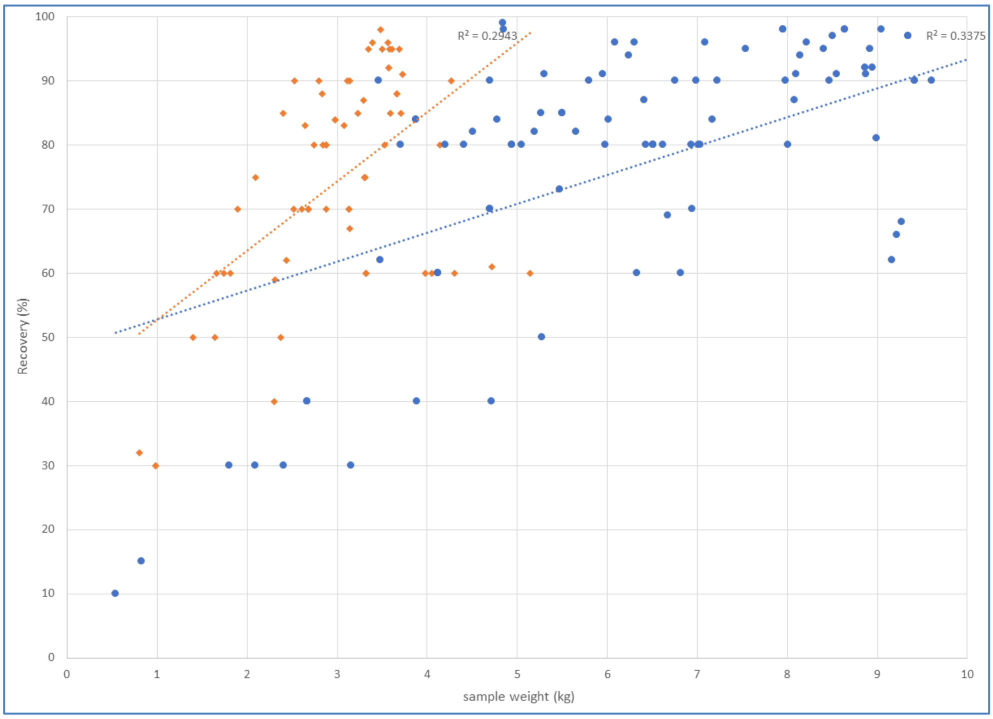



*Figure 4-3. Correlation between sample weight and recovery for the 2 drill diameter sample sets (5cm = orange; 8.5cm = blue)*

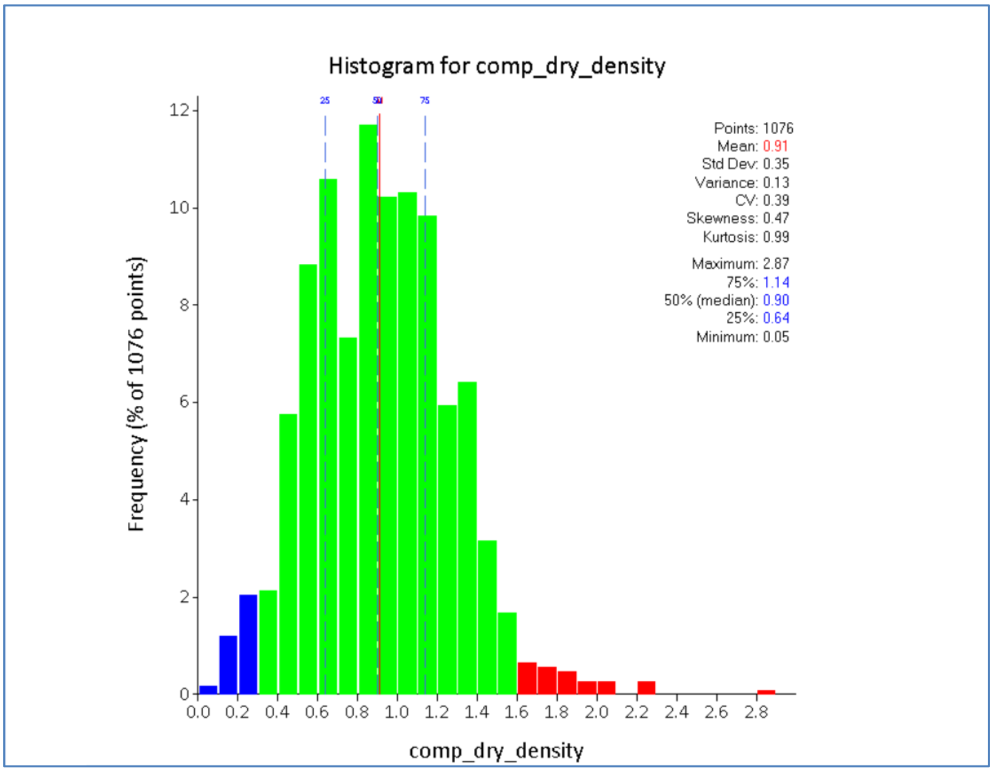



*Figure 4-4. Dry density histogram for values calculated assuming 100% recovery (compression of sample)*

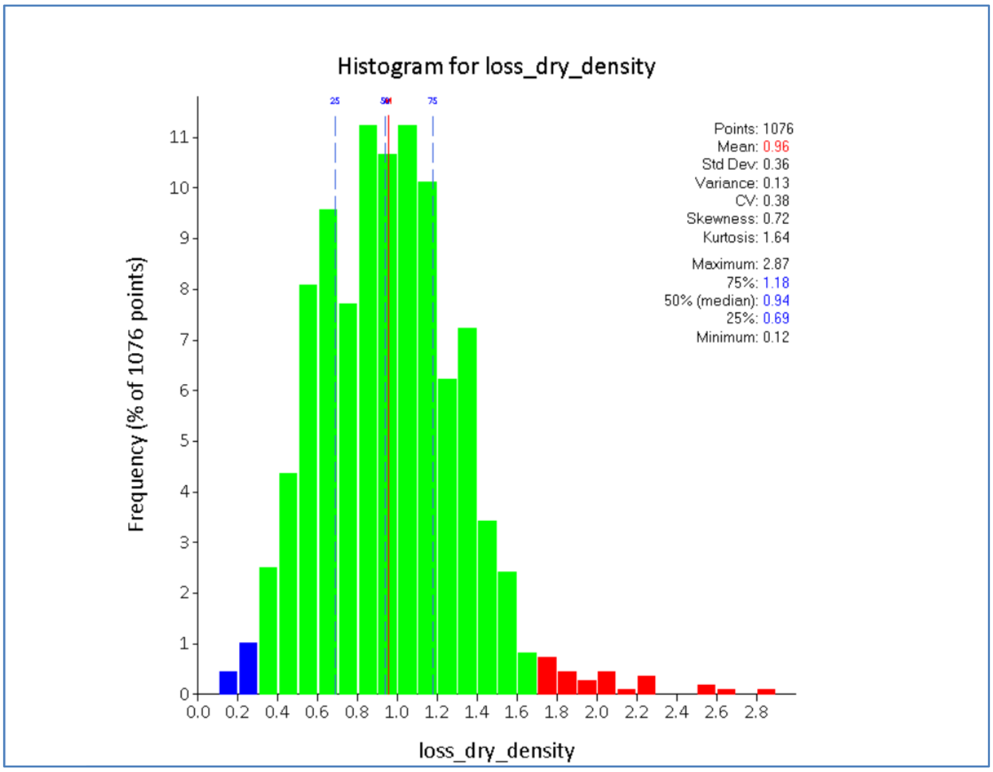



*Figure 4-5. Dry density histogram calculated on the assumption that recoveries are true recoveries with variable sample losses*

If the sample loss density model is assumed the average dry density across the WSF increases from 0.91 to 0.96 t/m$^3$ which makes a material difference to the final Mineral Resource tonnage. For the purposes of the Mineral Resource reported herein it was assumed that the loss model was appropriate.

Due to the variable nature of the density distributions with obvious multiple populations it was decided that simply applying a mean value to the deposit as a whole would be inappropriate. Density was thus interpolated using an inverse distance interpolation into individual blocks in an effort to mimic the variable distribution of values recorded in the drill samples.

The resulting block variation in estimated density reflects the known process and deposition activity across the site providing confidence that the updated dry density model is appropriate for reporting of Mineral Resources.

## 4.5 Statistical Analysis, Compositing and Outliers

The majority of samples were taken at 1m intervals. Where significant differences were observed within an interval (colour, grain size, mineralogy) the samples were sub-divided into shorter lengths but in the majority of cases the 1m interval held. Table 4-1 below summarises the statistics for the uncomposited (raw) data and after compositing to 1m intervals downhoile. The differences between the mean and variance of the two datasets is marginal and not considered significant. It was decided to carry out the resource estimation using the 1m composite data.

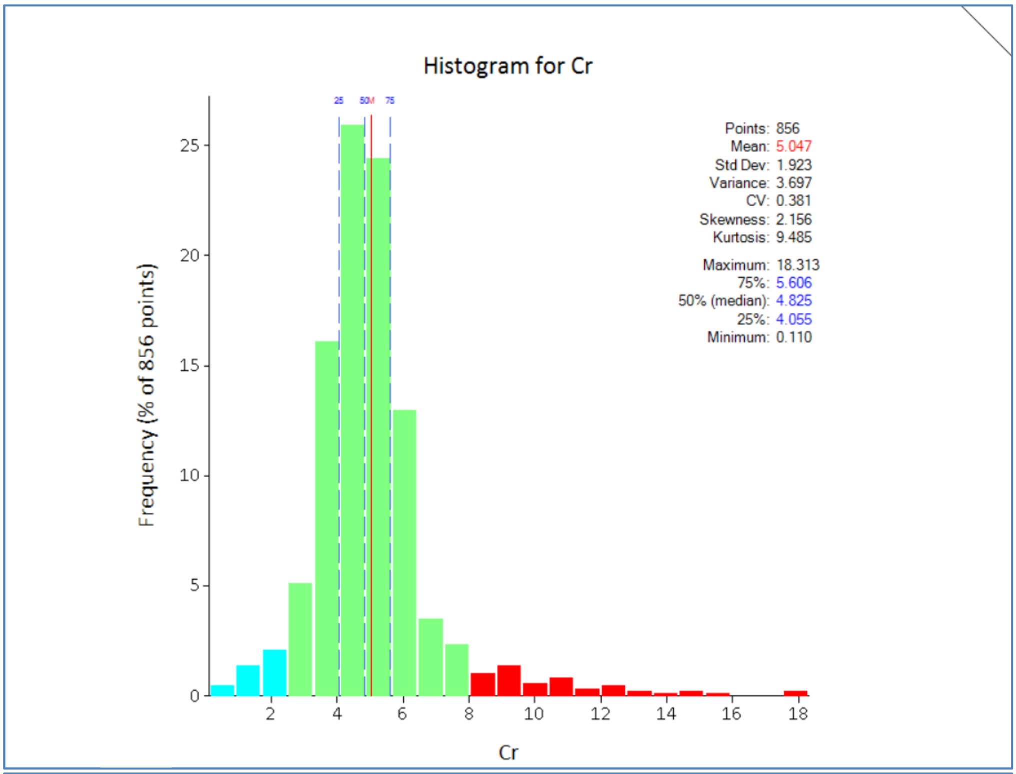
*Table 4-1. Summary statistics for the raw (uncomposited) and 1m composite drill assay data*

| Raw | Samples | Minimum | Maximum | Mean | SD | CV | Variance | Skewness | |
|---|---|---|---|---|---|---|---|---|---|
| Cr | 862 | 0.11 | 20.06 | 5.03 | 1.98 | 0.39 | 3.94 | 2.31 | |
| Mg | 862 | 1.06 | 31.16 | 23.7 | 5.89 | 0.25 | 34.73 | -2.49 | |
| Ca | 862 | 2.01 | 53.1 | 23.29 | 3.8 | 0.16 | 14.46 | -1.87 | |
| 1mcomp | Samples | Minimum | Maximum | Mean | SD | CV | Variance | Skewness | mean diff |
| Cr | 856 | 0.11 | 18.31 | 5.05 | 1.92 | 0.38 | 3.7 | 2.16 | 0.34% |
| Mg | 856 | 1.06 | 31.16 | 23.8 | 5.64 | 0.24 | 31.77 | -2.48 | 0.43% |
| Ca | 856 | 2.01 | 53.1 | 23.37 | 3.58 | 0.15 | 12.84 | -1.59 | 0.34% |

Figure 4-6, Figure 4-7 and Figure 4-8 show the statistical plots for the three variables (1m composite data). In the $Cr_2O_3$ plots (Figure 4-6) there is clear evidence for a high grade tail however it was considered that, given the nature of the deposit and the fact that the high grades occur within adjacent drillholes and at similar depths within the deposit, they can be considered a viable component of the grade distribution and there is no need data capping.

Similarly, for the MgO plots (Figure 4-7), the strong negative skew with a tail of low grades is coincident between adjoining boreholes and at similar depths. Therefore it was considered appropriate to retain these grades.

The histogram and probability plot for CaO (Figure 4-8) shows a very clear normal distribution and no data cutting was required for this variable.



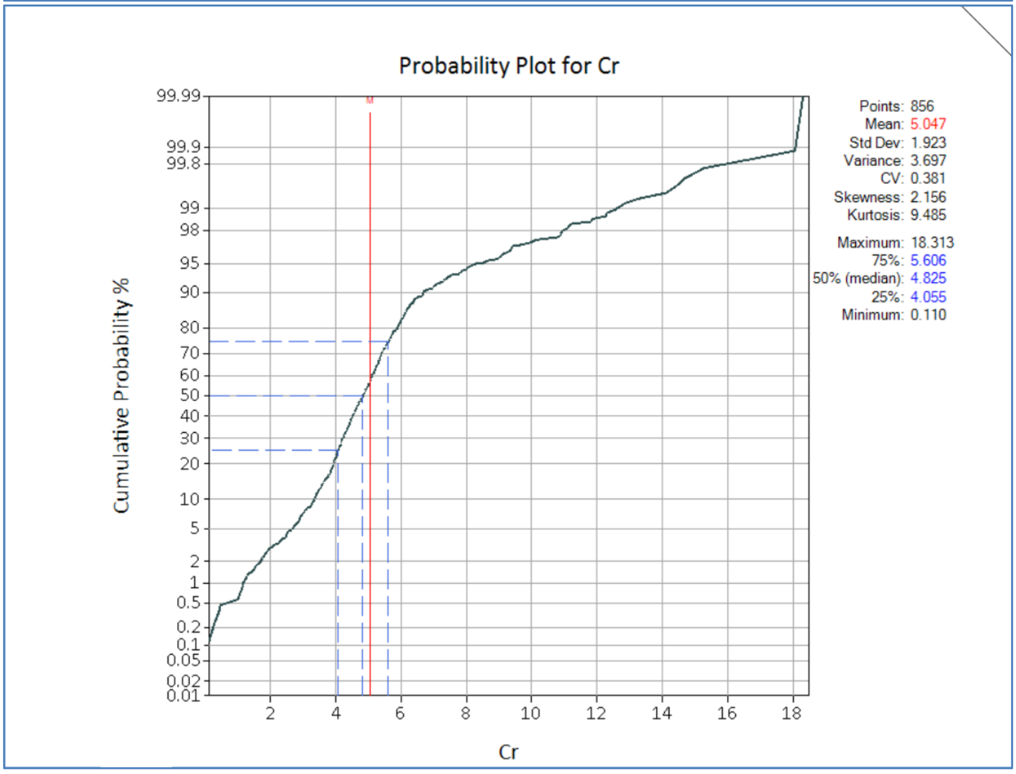
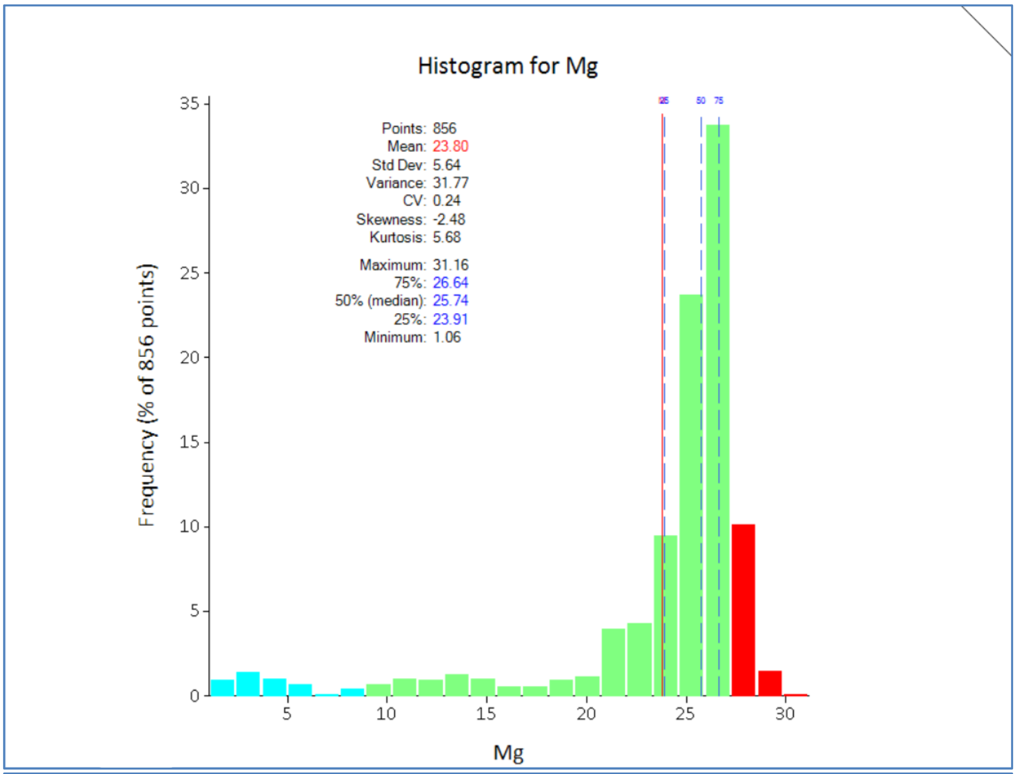




*Figure 4-6.* *Histogram (UPPER) and probability plot (LOWER of $Cr_2O_3$ 1m composite assay values obtained from the 2013 drilling campaign*



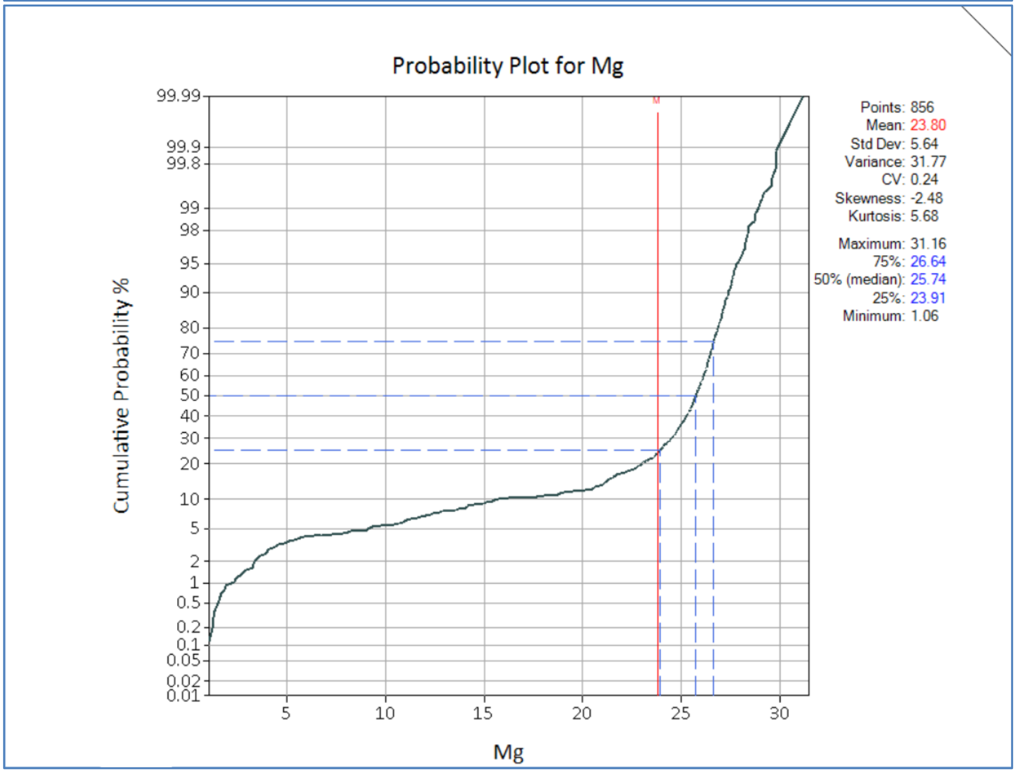




*Figure 4-7. Histogram (UPPER) and probability plot (LOWER) of MgO 1m composite assay values obtained from the 2013 drilling campaign*

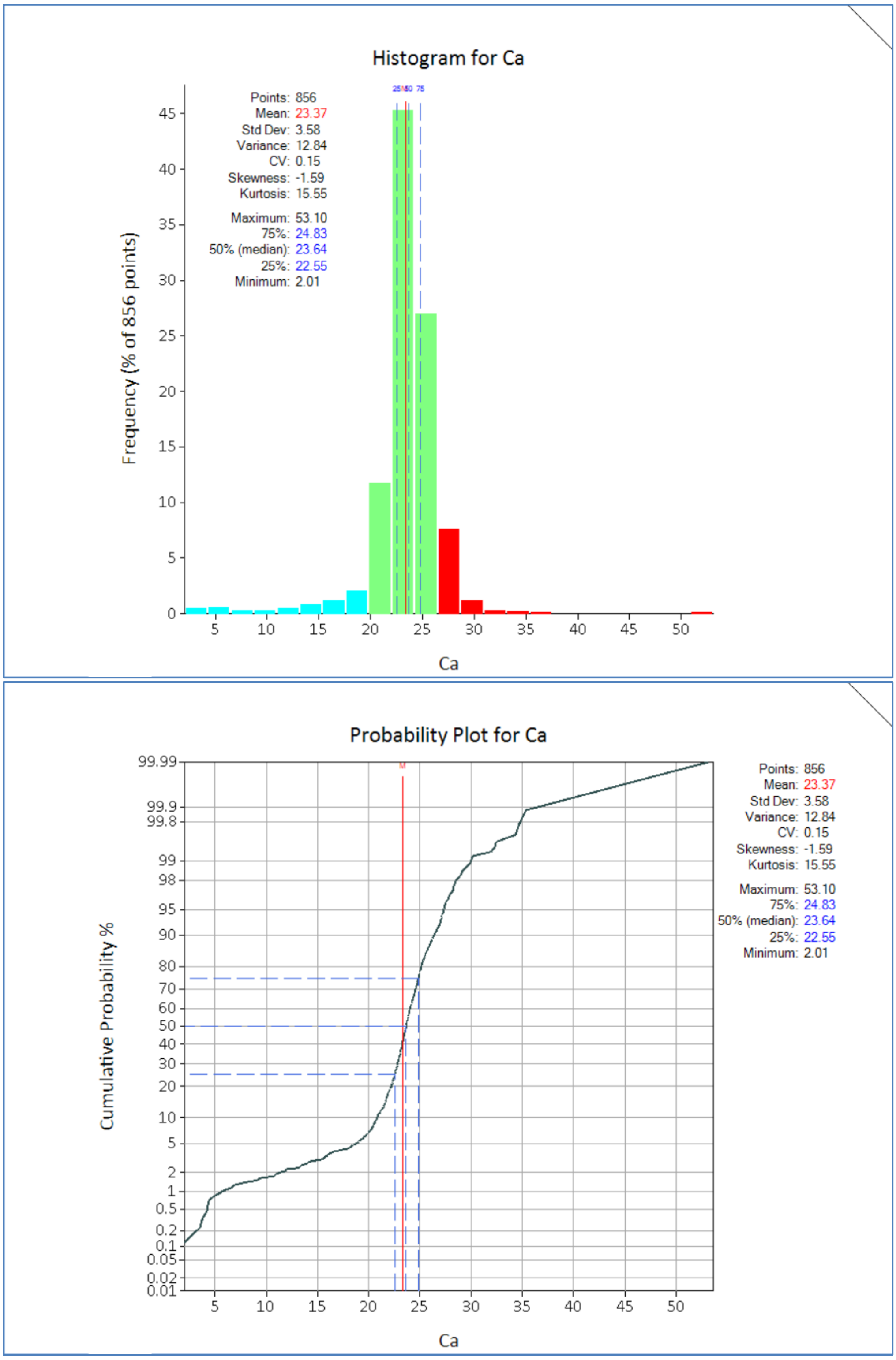



*Figure 4-8.* *Histogram (UPPER) and probability plot (LOWER) of CaO 1m composite assay values obtained from the 2013 drilling campaign*

## 4.6 Variography

The following figures (Figure 4-9 to Figure 4-11) show the experimental semi-variograms and the resulting modelled variograms foreach of the three variables and in each of the three primary directions. In each case the nugget variance has been derived from the vertical (downhole) variogram using a 1m lag to correspond with the composite length.

The primary and secondary directions have been modelled as 040° and 130° with no dip (horizontal). However, given the relatively small dimensions of the WSF it was not possible to obtain a true representative variogram map to allow a more detailed evaluation of possible directional trends. The two directions described above correspond to the main dimensions of the WSF and it is likely that the resulting directions are as much an artefact of the drill spacing and number of holes in these directions as they are to any actual variation in the grade characteristics.

In all cases the major and semi-major direction variograms have been modelled with very close maximum ranges and the resulting search ellipse derived from this modelling and used for the grade interpolation is circular in plan view with a very shallow vertical component of only 8m.

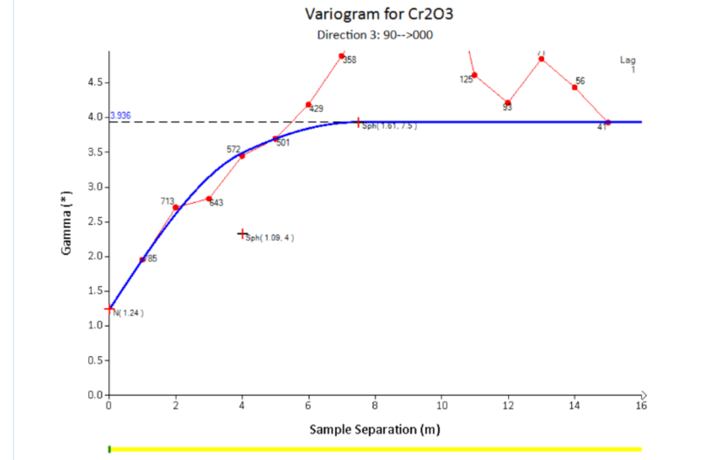
In all three variables the quality of the semi-variograms is poor. This is down to a number of factors, namely:

- The relatively short distance in the primary directions leading to a limited number of holes available at the longer lag intervals limiting the range of reliability of the variograms.
- The variable nature of the grade distribution within the deposit caused by the nature of the style of deposition and the variable nature of the feed material into the repository during its lifetime.

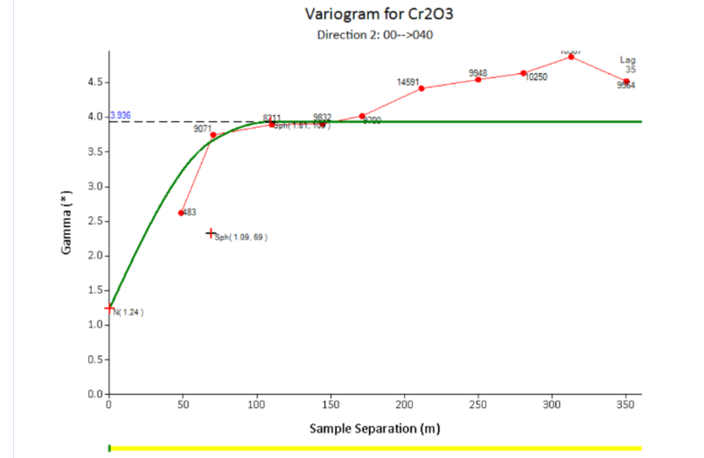
Generally the 040° direction produces a slightly more robust variogram than those in the 130° direction which is unsurprising given that this corresponds with the longer axis of the WSF.

The vertical (downhole) variograms generally show a robust experimental variogram and can be modelled to between a 6-8m maximum range.

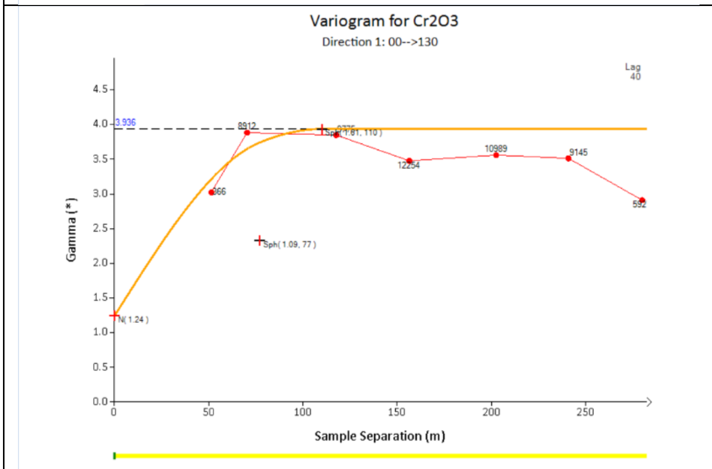
The directional variograms generally show a high nugget variance and without the benefit of the vertical variogram modelling they would be considered close to pure nugget effect. The conclusion is that the grade variability within the WSF is relatively high and that the 50m hole spacing is at the limit of what could be used to reliably inform blocks between the holes.




| Cr2O3 vertical | |
|---|---|
| Lag | 1m |
| Co | 1.24 |
| C1 | 1.09 |
| a1 | 4m |
| C2 | 1.61 |
| a2 | 7.5m |

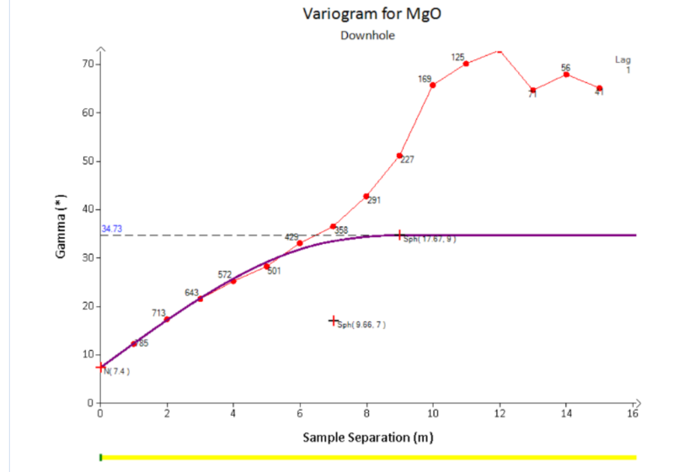



| Cr2O3 dip:0; dir:040 | |
|---|---|
| Lag | 35m |
| Co | 1.24 |
| C1 | 1.09 |
| a1 | 70m |
| C2 | 1.61 |
| a2 | 110m |

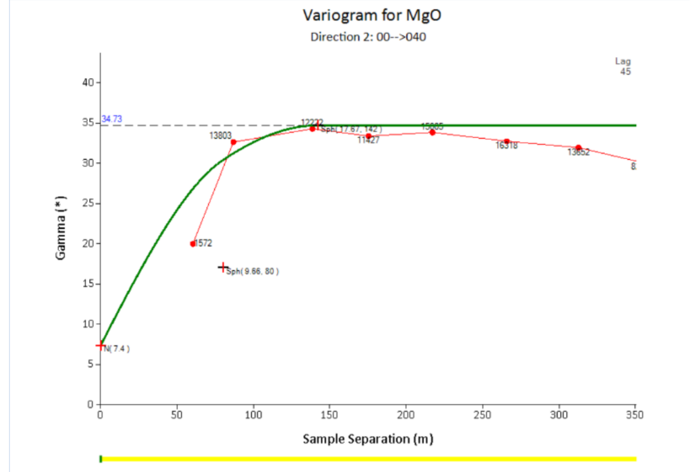



| Cr2O3 dip:0; dir:130 | |
|---|---|
| Lag | 40m |
| Co | 1.24 |
| C1 | 1.09 |
| a1 | 77m |
| C2 | 1.61 |
| a2 | 110m |

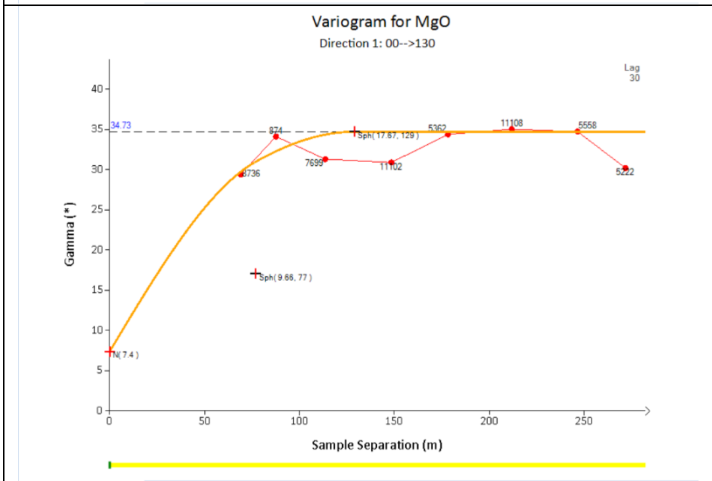
*Figure 4-9. Experimental and model directional variograms for $Cr_2O_3$ raw assay data with corresponding modelling results*




| MgO vertical | |
|---|---|
| Lag | 1m |
| Co | 7.4 |
| C1 | 9.66 |
| a1 | 7m |
| C2 | 17.67 |
| a2 | 9m |

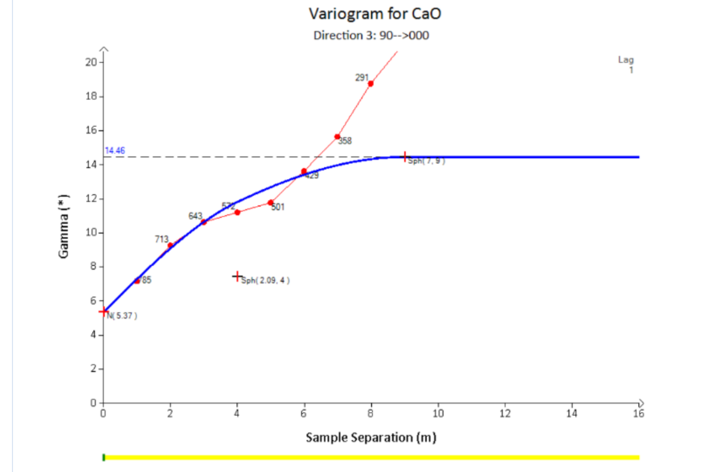



| MgO dip:0; dir:040 | |
|---|---|
| Lag | 45m |
| Co | 7.4 |
| C1 | 9.66 |
| a1 | 80m |
| C2 | 17.67 |
| a2 | 140m |

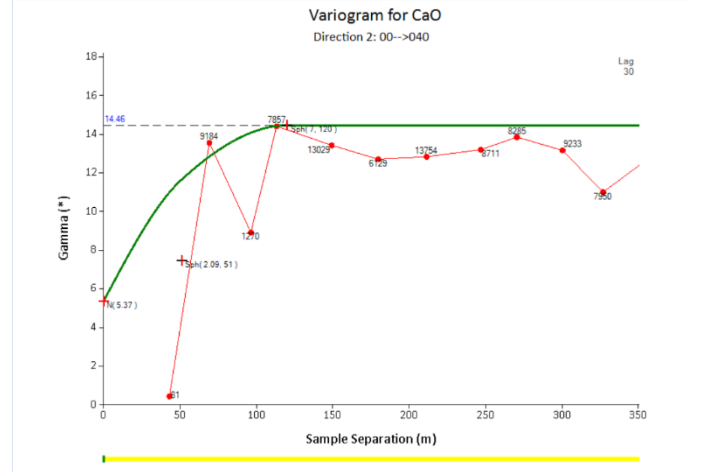



| MgO dip:0; dir:130 | |
|---|---|
| Lag | 40m |
| Co | 7.4 |
| C1 | 9.66 |
| a1 | 80m |
| C2 | 17.67 |
| a2 | 130m |

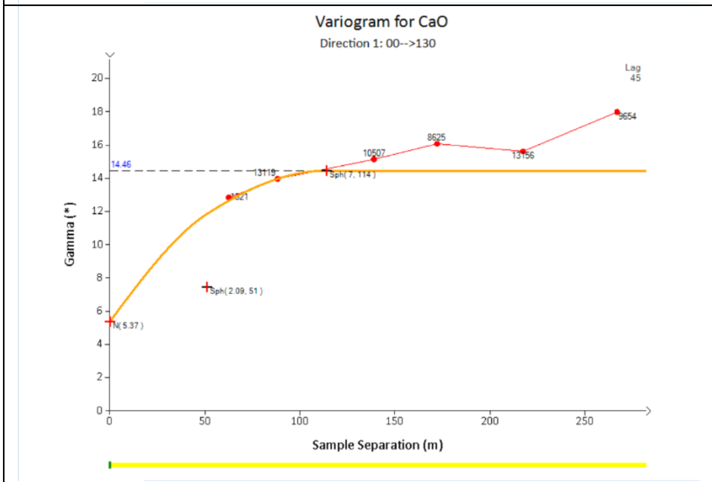
*Figure 4-10.* *Experimental and model directional variograms for MgO raw assay data with corresponding modelling results*




| CaO vertical | |
|---|---|
| Lag | 1m |
| Co | 5.37 |
| C1 | 2.09 |
| a1 | 4m |
| C2 | 7.0 |
| a2 | 9m |




| CaO dip:0; dir:040 | |
|---|---|
| Lag | 40m |
| Co | 5.37 |
| C1 | 2.09 |
| a1 | 50m |
| C2 | 7.0 |
| a2 | 120 |




| CaO dip:0; dir:130 | |
|---|---|
| Lag | 45m |
| Co | 5.37 |
| C1 | 2.09 |
| a1 | 50m |
| C2 | 7.0 |
| a2 | 115m |

*Figure 4-11. Experimental and model directional variograms for CaO raw assay data with corresponding modelling results*

## 4.7 Grade Model Validation (QKNA)

Prior to construction of the block model, the variogram models are used to evaluate the perceived quality of the planned kriged model in a process known as Kriging Neighbourhood Analysis (KNA). This process evaluates a number of factors which help to quantify the quality of the resulting final block model, namely:

- Evaluates the optimum block size taking into account the complexity of the deposit and the level of understanding and drill spacing
- Evaluates the effect of the sample distribution on the final estimate, specifically looking at the optimum minimum and maximum number of samples to use to estimate a block without introducing negative kriging weights (NKW), through the screen effect, to the estimation which can have a detrimental effect on the final results.
- Evaluates the block size in terms of likely results for kriging quality parameters specifically the slope of regression (SoR). The SoR can be used to assist in deciding Resource classification categories of the deposit but is dependent on the quality of the initial semi-variogram models. An SoR of greater than 70% can generally be considered of sufficient quality to assign indicated category resource classification but the final classification is also dependent on a number of other factors and SoR cannot be used unilaterally.

The KNA evaluation shown below relates only to the $Cr_2O_3$ data.

Figure 4-12 shows graphs highlighting the probable slope of regression results and negative kriging weights resulting from a range of block sizes. Given the hole spacing in the WSF of 50x50m a realistic block size could be expected to be approximately 1/3 of this spacing at around 15-20m. However, due to the relatively uniform nature of the deposit and the need to accurately define monthly production tonnages, a number of smaller block sizes were also evaluated. The result show that the 8m x 8m x 4m block size gives a relatively high slope of regression value and range compared to some larger blocks. Also the negative weights analysis for this block size shows that there is not a significant penalty in negative weights when dropping down to this block size.

Figure 4-13 shows the results of the detailed SoR and NKW analysis for the chosen block size of 8m x 8m x 4m over a range of sample numbers used for the interpolation of grades into the blocks.

The results show that up to a maximum of 24 composites used for estimation of $Cr_2O_3$ block values will generally not produce any negative kriging weights. Also using a maximum of 24 composites will produce a range of SoR results with the majority above 70%. The results from the CaO KNA analysis produced very similar results to those from the $Cr_2O_3$ while those for the MgO data indicated up to 16 composites could be reliably used.

For the sake of standardising the search parameters it was decided to use a minimum of 8 and a maximum of 24 composites per block for the estimation of all three variables.

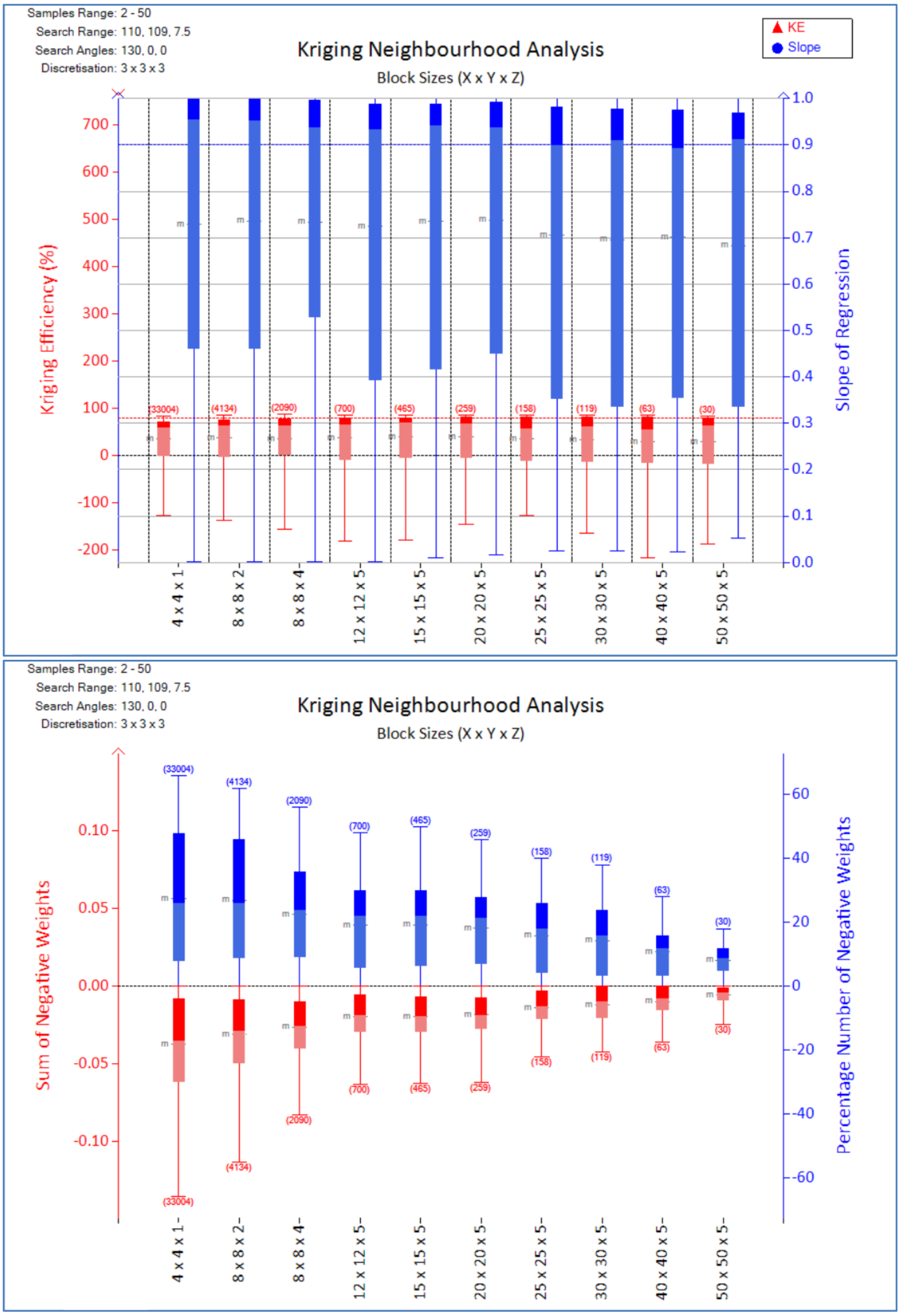



*Figure 4-12.* *KNA plots showing results for Kriging Efficiency and Slope of Regression (UPPER), and probability of interpolating negative krige weights (LOWER) over a range of potential block sizes.*

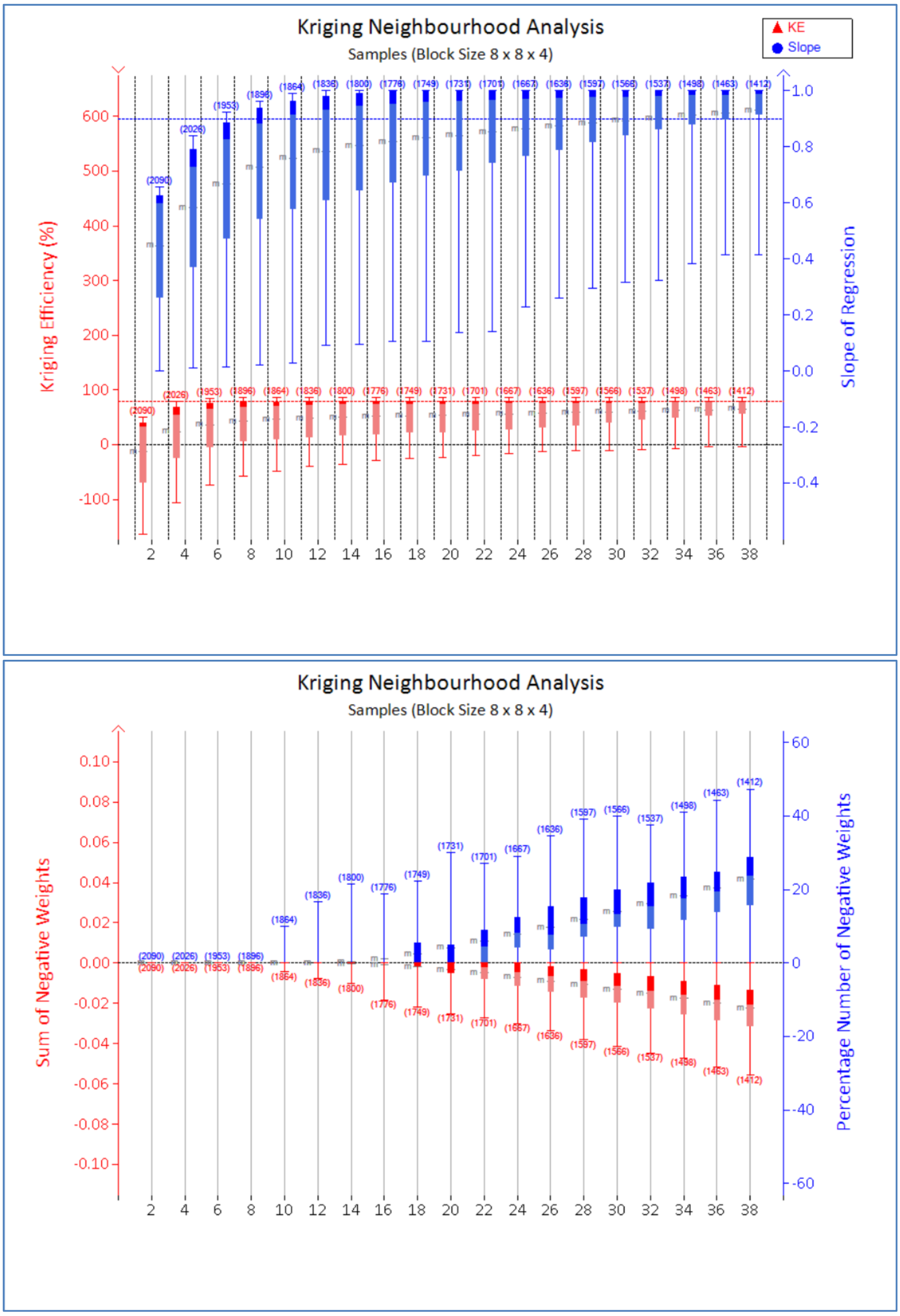



*Figure 4-13. KNA plots showing results for Kriging Efficiency and Slope of Regression (UPPER), and probability of interpolating negative krige weights (LOWER) for the chosen block size over a range a sample numbers used for interpolation.*

## 4.8 Block Model Grade Interpolation

The following table summarises the prototype for the resource block model created for the Former Bicapa-Tarnaveni chemical works WSF 2019 Mineral Resource.

*Table 4-2. Block model prototype for Former Bicapa-Tarnaveni chemical works WSF Mineral Resource estimate March 2019*

| | | | | | | |
|---|---|---|---|---|---|---|
| Min Coordinates | Y | 535250 | X | 443550 | Z | 260 |
| Max Coordinates | Y | 535690 | X | 444150 | Z | 312 |
| Parent Block size | Y | 8m | X | 8m | Z | 4m |
| Sub Block size | Y | 0.5m | X | 0.5m | Z | 0.25m |
| Rotation | Bearing | -22 | Dip | 0 | Plunge | 0 |

Figure 4-14 shows a perspective image of the WSF and the contained drillholes with the search ellipse used for the block kriging superimposed to highlight the relatively large search. However it should be considered that because of the maximum samples used for each block krige restricted to 24, very few of the blocks will actually utilise the full extents of the search ellipse.

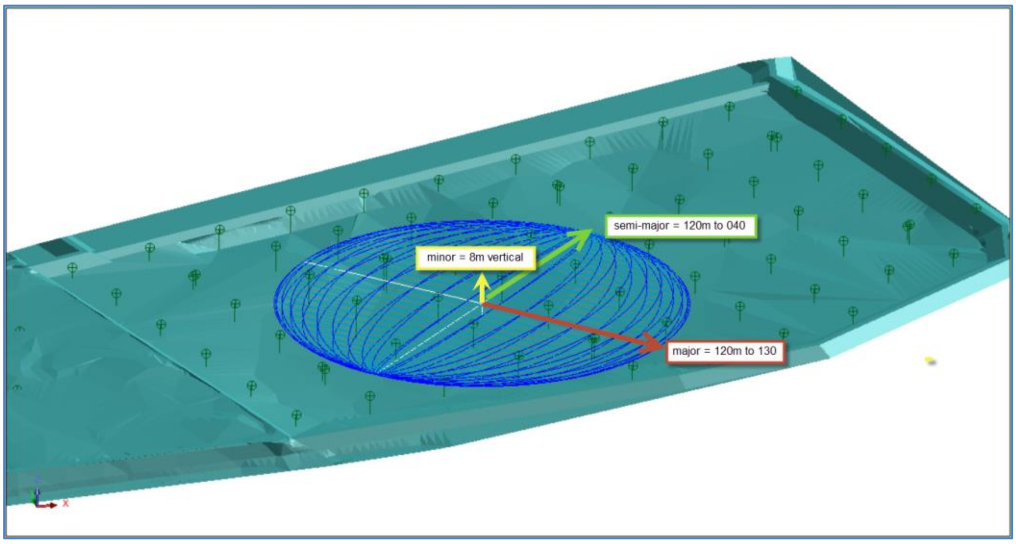



*Figure 4-14. WSF showing drillholes with search ellipse superimposed*

The block model was interpolated using the search radius of 120m x 120m x 8m with the primary orientations along the 040° and 130° directions and using a minimum of 8 and maximum of 24 composites per block. No octants were used and the search ellipse was used a single domain.

Block values were interpolated by ordinary kriging for $Cr_2O_3$, MgO, CaO and SoR. Dry density values were calculated using and inverse distance interpolant (power ^1) utilising the same search ellipse and min/max samples as the kriging.

A $Cr_{(eq)}$ grade was calculated for each block using the results from the estimation of $Cr_2O_3$, MgO, and CaO and the recovery values planned from the study. The following equation was used to calculate the $Cr_{(eq)}$ grade.

$$Cr(eq) = (Cr * 0.774) + \left(\left(\left(\frac{Mg * 1850}{4582}\right) * 0.64\right) + \left(\left(\frac{Ca * 202}{4582}\right) * 0.635\right)\right)$$

- Cr: recovery = 77.4%; price = $4,582/t
- Mg: recovery = 64%; price = $1,850/t
- Ca: recovery = 63.5%; price = $202/t

Figure 4-15 is a histogram exhibiting the relatively high percentage of blocks kriged with a high SoR value with some 80% of the kriged blocks showing a SoR value of >70%, indicative of the relatively high quality of the krige and providing a high confidence in the final grade values of individual blocks.

Figure 4-16 shows a number of views of the resulting block model for the $Cr_2O_3$ grades, SoR and density.

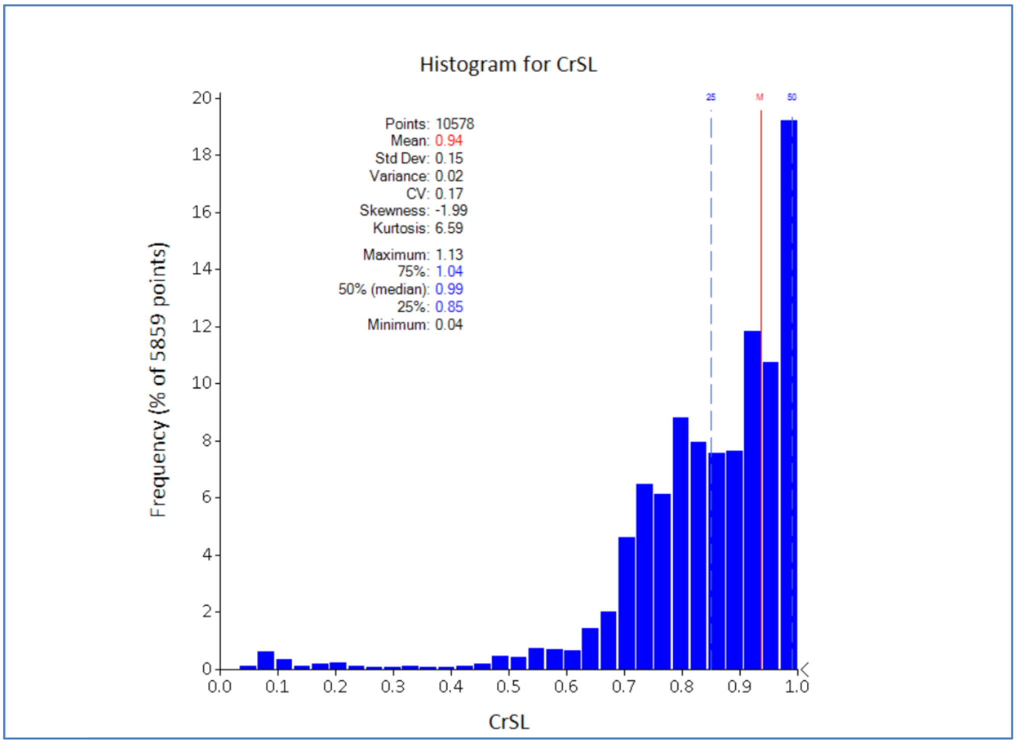



*Figure 4-15. Histogram showing distribution of slope of regression values for blocks kriged within the boundaries of the Former Bicapa-Tarnaveni chemical works WSF*

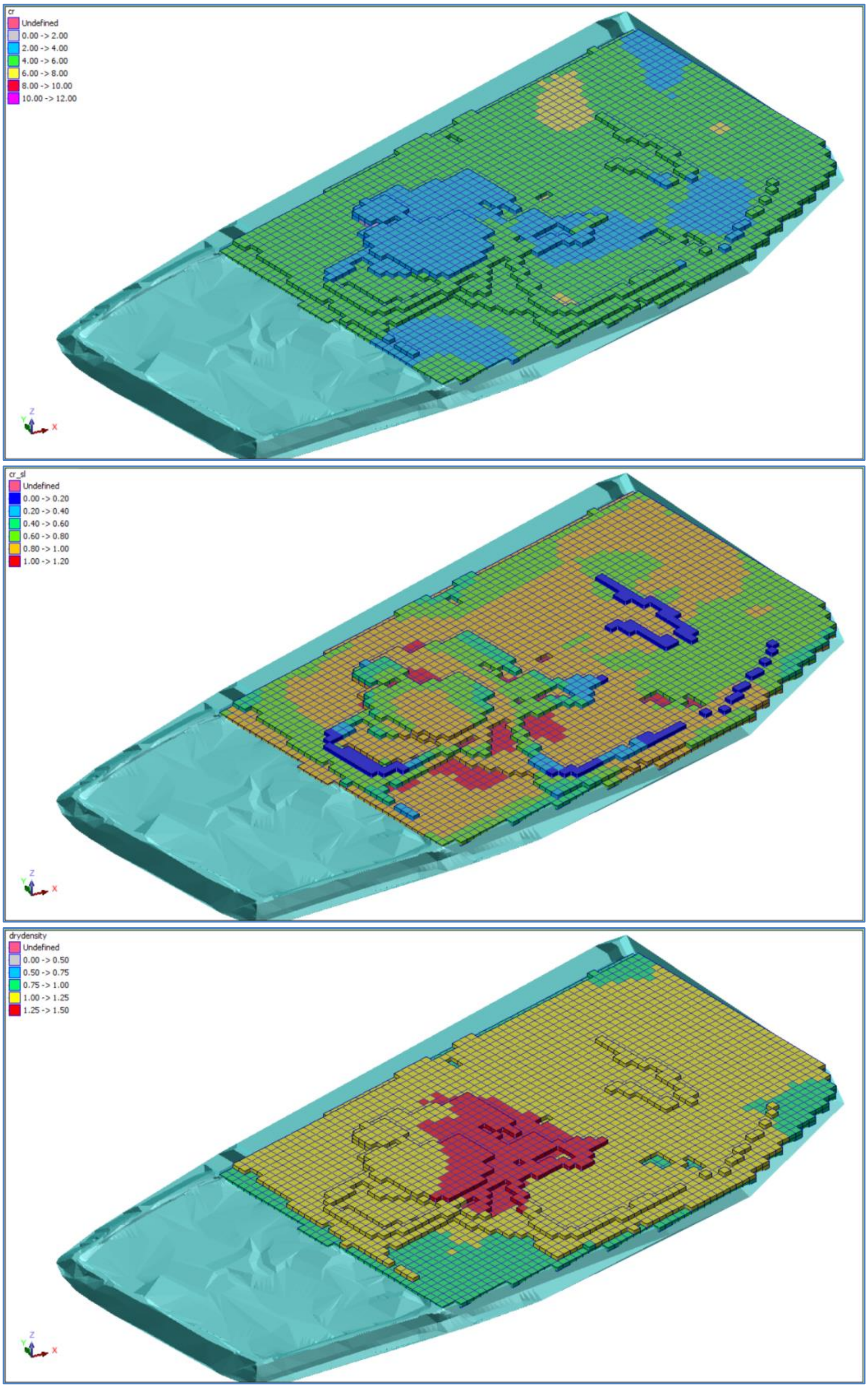



*Figure 4-16. Perspective views of the WSF block model showing blocks coloured by $Cr_2O_3$ grade (UPPER), Kriging slope of regression (CENTRE), and IDW derived dry density (LOWER)*

## 4.9 Block Model Validation

Validation is a method whereby the resulting block model is compared against the source input data used for the interpolation on a local basis to allow some quantification of the accuracy of the resulting block model and its ability to represent the source data locally.

Validation can be carried out in a number of ways, the most basic of which is simple visual comparison between block values and adjacent sample grades on cross section.

The images presented in Figure 4-17 consist of Swath plots derived by subdividing the block model into a series of regular narrow slices in the X, Y and Z directions. Comparing the average grade of blocks in a slice with the average grade of original composite samples in the same slice gives an idea of the local variability between source and estimated grades.

By its very nature, the kriging algorithm smooths the grades from the original source data reducing the impact of outliers and hence the block grade curve shows a relatively smooth line while the composite grades show much more variability. However, in all directions it is clear that the average block grades closely mimic the overall distribution trend of the source sample composite grades.

The results presented indicate that the kriging parameters are allowing the block model to accurately represent the distribution and average grades of the source samples. However the plot for vertical slices (Z) does show a slight overestimation by the blocks in the uppermost levels of the deposit. The likely cause is the relative lack of samples at these elevations resulting in a less rigorous dataset available for the kriging.


*Figure 4-17.* *Swath plots highlighting the correlation between raw assay data and kriged block values for 15m slices in the X and Y cross sections (UPPER and CENTRE) and for 4m vertical slices (LOWER) through the WSF block model*

Figure 4-18 below demonstrates the close correlation between the original sample grades and the final block grades. Due to the smoothing caused by the kriging routine the histogram for the block grades has a significantly lower variance but the overall mean grades and distribution are very closely matched adding confidence to the quality of the block kriging.

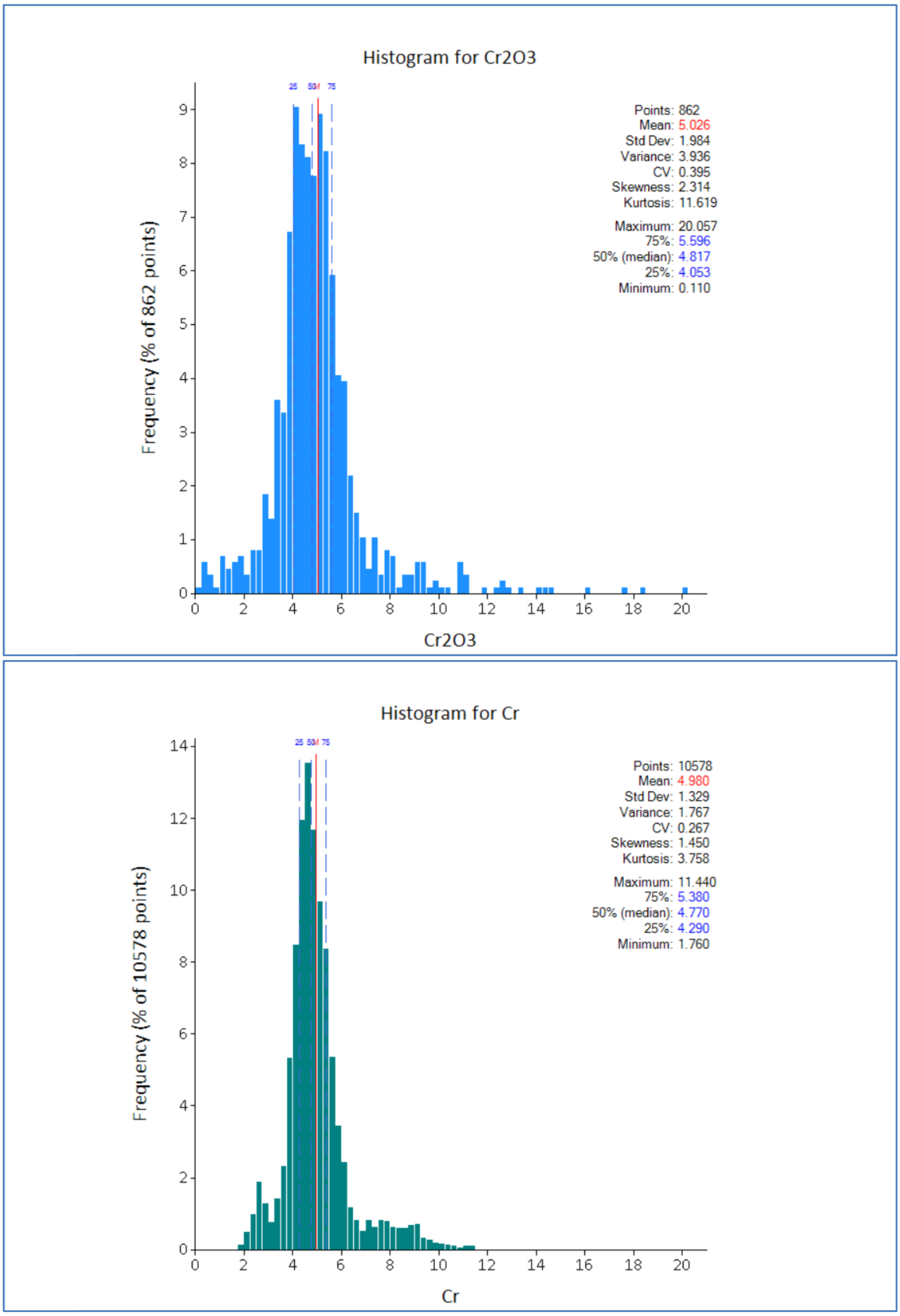



*Figure 4-18.* *Histogram plots comparing the original raw sample data $Cr_2O_3$ values (UPPER) with the histogram of $Cr_2O_3$ block grades (LOWER).*

## 4.10 Mineral Resource Classification

The definition of a Mineral Resource as specified by the JORC/PERC is ***"a concentration or occurrence of 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"***.

Additionally, the PERC code states ***"The Standard applies to the reporting of all potentially economic mineralised material at a mine site. This can include mineralised fill, remnants, pillars, low grade mineralisation, stockpiles, dumps and tailings (remnant materials) where there are reasonable prospects for eventual economic extraction in the case of Mineral Resources, and where extraction is reasonably justifiable in the case of Mineral Reserves"***.

Given the high confidence implied by the results of the KNA and the resulting SoR model. The grade model alone allows the classification of the deposit as Indicated Mineral Resource under the guidelines set out by the JORC code (2012) and thre PERC code (2017).

However, the quality of the kriging results should not be taken in isolation when considering the classification. Other factors to be considered are the geological confidence, quality of the drilling and sampling, and the quality of the density measurements which obviously has a direct bearing on the resource tonnage.

The geological model, as discussed above (Section 3) is based on the assumption of constant feed of slurry from the processing plant over a period of almost 50 years. Due to the nature of the deposition environment and the lack of information on feed grades and process recoveries, it was not possible to sub-divide the WSF on the basis of specific geological or mineralogical characteristics of the source material. However, the results from the evaluation drilling at 50m centres is clearly showing areas of relatively high and low grades which can be traced between a number of holes and can be considered as coherent zones of relatively uniform grade distribution. It is therefore considered that the WSF as a whole exhibits a degree of stationarity with relatively gradual changes between areas of grade variability. The drill spacing can be considered to be at the limit of reliability and if wider drilling had been used then it is likely that no useable semi-variograms could have been produced. Additionally the use of 1m sampling vertically has had the beneficial effect of allowing the vertical variability to be well defined. Based on the above it is the Consultants opinion that the geological understanding of the deposit would allow the application of an Indicated category.

Overall, taking all the above into account, it is the Consultants opinion that the deposit as a whole can be considered to lie within the Indicated Mineral Resource category as defined by the JORC 2012 Guidelines.

## 4.11 Mineral Resource Statement

The Mineral Resource Statement for the Former Bicapa-Tarnaveni chemical works WSF is based on the results of the drilling carried out in 2013 and the subsequent testwork conducted by WET and their consultants. The classification applied by the Consultant and reported in Table 4-3 is based on the Consultants understanding of the deposit structure and grade distribution as implied from the supplied drillhole database. Additionally the Consultant has drawn on the information contained within the 2013 SRK report, specifically regarding the QAQC analysis of the check samples and duplicates. At the time of reporting, the Consultant has not carried out a site inspection and was not present at the time of the 2013 drilling programme.

The Mineral Resource Statement is reported at a 0.0% Cut Off Grade. The reasoning behind this is the fact that the company plans (and is actually required) to excavate the contents of the WSF in their entirety regardless of grade variations.

*Table 4-3. Former Bicapa-Tarnaveni chemical works WSF Mineral Resource Statement, March 2019*

| Domain | Category | Tonnes | SG | $Cr_2O_3$ % | MgO % | CaO % | $Cr_{(eq)}$ % |
|---|---|---|---|---|---|---|---|
| WSF | Measured | - | - | - | - | - | |
| | Indicated | 1,920,100 | 0.98 | 5.01 | 24.07 | 23.34 | 10.75 |
| | **Meas+Ind** | **1,920,100** | **0.98** | **5.01** | **24.07** | **23.34** | **10.75** |
| | Inferred | - | - | - | - | - | |

## 4.12 Previous Mineral Resource Estimates

In their 2013 report, SRK produced a Mineral Inventory in accordance with the JORC Code (2012) for the Project which ranges from approximately 990 to 2,900 Kt, at a grade range of 3.5 to 6% for Cr2O3; 16 to 26% for MgO; and 21 to 25% for CaO.

These ranges match closely with those produced for the current Resource Statement reported above with the tonnes and grade for $Cr_2O_3$ and CaO lying roughly at the mid point of the ranges reported by SRK. The SRK range for MgO is relatively large and the grade of MgO reported in the current report lies at the upper end of the SRK reported range.

The inclusion of a $Cr_{(eq)}$ grade gives an indication of the positive impact provided by including the Mg and Ca as by products in the final process.

# 5 INTERPRETATION AND CONCLUSIONS

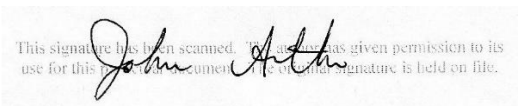
- The Former Bicapa-Tarnaveni chemical works WSF has been extensively investigated by WET and the data provided to the Consultant has allowed the definition of a Mineral Resource Estimate for the WSF classified under the guidelines of the JORC (2012) reporting code of some 1.92Mt of material with a $Cr_2O_3$ grade of 5.0% (0.0 COG) and a $Cr_{(eq)}$ grade of some 10.75% when Mg and Ca are included as by products.
- The quality of the survey and sampling data appears high and the extensive coverage of the evaluation drilling on 50m centres and with all holes encountering the base of the deposit, has allowed the volume of the deposit to be accurately and confidently modelled.
- The results from the drilling allow robust semi-variogram models to be derived which can be validated and quantified in terms of the quality of the final block estimates.
- The results from the block modelling can similarly be quantified in terms of potential errors and variability and the result of these checks indicate the relatively high quality of the kriging throughout the deposit.
- Using the density values calculated from the assay database, and assuming a degree of core loss, the average density across the site is calculated as 0.98t/$m^3$ based on estimation of density for individual blocks. The observed block variation in estimated density reflects the known process and deposition activity across the site providing confidence that the updated dry density model is appropriate for reporting of Mineral Resources.

# 6 RECOMMENDATIONS

- Non applicable

# 7 REFERENCES

**SRK Consulting *(2013)***: *A Grade Tonnage Estimate on the Contained Wastes at the former Bicapa-Tarnaveni Chemical Plant in Judet Mures, Romania (report # UK5355)*



| | |
|---|---|
| Dr. John Arthur | [Name Surname], |
| CGeol FGS, Principal Geologist | [Designation & Specialisation], |

# A TECHNICAL APPENDIX – EXCAVATION BLOCK LISTING

| Year | month | level | MBLOCK | blk volume | BLK Tonnes | SG | Cr2O3 | CaO | MgO | Cr(eq) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ex1 | | 1001 | 48740 | 50563 | 1.05 | 5.37 | 25.01 | 25.03 | 11.33 |
| 1 | ex7 | | 1007 | 42066 | 42333 | 1.01 | 2.99 | 22.63 | 21.89 | 8.6 |
| 1 | 1 | Primary | 1011 | 19,523 | 19,227 | 0.99 | 5.89 | 24.57 | 23.87 | 11.41 |
| 1 | 2 | Primary | 1021 | 19,627 | 19,238 | 0.98 | 5.64 | 24.74 | 24.30 | 11.34 |
| 1 | 3 | Primary | 1031 | 18,670 | 18,281 | 0.99 | 5.35 | 24.96 | 24.06 | 11.06 |
| 1 | 4 | Primary | 1041 | 18,814 | 18,972 | 1.02 | 5.00 | 25.04 | 23.83 | 10.73 |
| 1 | 5 | Primary | 1051 | 18,836 | 20,280 | 1.09 | 4.89 | 24.81 | 23.91 | 10.66 |
| 1 | 6 | Primary | 1061 | 18,753 | 21,414 | 1.16 | 5.00 | 24.40 | 23.95 | 10.74 |
| 1 | 7 | Primary | 1071 | 18,407 | 21,838 | 1.20 | 5.19 | 24.05 | 24.04 | 10.90 |
| 1 | 8 | Primary | 1081 | 15,782 | 17,701 | 1.16 | 5.23 | 24.67 | 24.38 | 11.04 |
| 1 | 9 | Primary | 1091 | 19,079 | 20,654 | 1.13 | 5.07 | 25.12 | 24.71 | 11.01 |
| 1 | 10 | Primary | 1101 | 18,910 | 20,186 | 1.12 | 5.10 | 25.05 | 24.65 | 11.01 |
| 1 | 11 | Primary | 1111 | 18,897 | 19,791 | 1.10 | 5.15 | 24.94 | 24.54 | 11.02 |
| 1 | 12 | Primary | 1121 | 18,904 | 19,215 | 1.06 | 5.15 | 24.82 | 24.51 | 11.01 |
| 1 | 3 | Secondary | 1032 | 966 | 876 | 0.92 | 8.96 | 22.53 | 15.81 | 11.65 |
| 1 | 4 | Secondary | 1042 | 796 | 738 | 0.93 | 9.71 | 23.02 | 16.44 | 12.41 |
| 1 | 5 | Secondary | 1052 | 839 | 750 | 0.90 | 10.03 | 23.46 | 16.29 | 12.63 |
| 1 | 6 | Secondary | 1062 | 752 | 647 | 0.87 | 9.97 | 23.55 | 15.56 | 12.40 |
| 1 | 7 | Secondary | 1072 | 796 | 712 | 0.90 | 9.62 | 22.94 | 15.79 | 12.17 |
| 1 | 8 | Secondary | 1082 | 2,365 | 2,284 | 0.97 | 9.05 | 21.97 | 16.92 | 11.99 |
| 1 | 9 | Secondary | 1092 | 611 | 507 | 0.84 | 9.15 | 24.48 | 15.10 | 11.67 |
| 1 | 10 | Secondary | 1102 | 627 | 511 | 0.82 | 8.88 | 25.28 | 14.68 | 11.37 |
| 1 | 11 | Secondary | 1112 | 823 | 652 | 0.80 | 8.49 | 25.01 | 15.06 | 11.16 |
| 1 | 12 | Secondary | 1122 | 759 | 576 | 0.77 | 8.22 | 24.77 | 15.20 | 10.98 |
| 2 | 1 | Primary | 2011 | 18,920 | 18,722.00 | 1.03 | 5.11 | 24.76 | 24.43 | 10.97 |
| 2 | 2 | Primary | 2021 | 18,957 | 18,267.00 | 1.00 | 5.07 | 24.72 | 24.33 | 10.90 |
| 2 | 3 | Primary | 2031 | 19,047 | 17,671.00 | 0.96 | 5.03 | 24.64 | 24.13 | 10.82 |
| 2 | 4 | Primary | 2041 | 18,966 | 16,833.00 | 0.92 | 5.00 | 24.57 | 23.86 | 10.73 |
| 2 | 5 | Primary | 2051 | 18,931 | 16,321.00 | 0.88 | 5.00 | 24.45 | 23.61 | 10.65 |
| 2 | 6 | Primary | 2061 | 18,837 | 16,338.00 | 0.88 | 4.92 | 24.48 | 23.94 | 10.68 |
| 2 | 7 | Primary | 2071 | 18,810 | 16,364.00 | 0.89 | 5.01 | 24.43 | 24.32 | 10.85 |
| 2 | 8 | Primary | 2081 | 18,987 | 17,061.00 | 0.91 | 5.01 | 24.66 | 25.12 | 11.06 |
| 2 | 9 | Primary | 2091 | 18,583 | 16,848.00 | 0.92 | 5.11 | 24.68 | 25.65 | 11.27 |
| 2 | 10 | Primary | 2101 | 17,616 | 15,926.00 | 0.91 | 5.22 | 24.54 | 25.74 | 11.37 |
| 2 | 11 | Primary | 2111 | 17,251 | 14,536.00 | 0.86 | 5.32 | 24.48 | 26.17 | 11.56 |
| 2 | 12 | Primary | 2121 | 19,264 | 13,885.00 | 0.75 | 4.66 | 24.99 | 25.68 | 10.94 |
| 2 | 1 | Secondary | 2012 | 655 | 498 | 0.77 | 7.92 | 24.45 | 14.86 | 10.66 |
| 2 | 2 | Secondary | 2022 | 580 | 449 | 0.79 | 7.81 | 23.49 | 14.56 | 10.46 |
| 2 | 3 | Secondary | 2032 | 565 | 431 | 0.79 | 7.77 | 22.72 | 14.29 | 10.35 |
| 2 | 4 | Secondary | 2042 | 585 | 459 | 0.80 | 7.77 | 21.92 | 13.66 | 10.16 |
| 2 | 5 | Secondary | 2052 | 578 | 445 | 0.79 | 7.71 | 21.42 | 13.63 | 10.09 |
| 2 | 6 | Secondary | 2062 | 636 | 500 | 0.81 | 7.82 | 20.38 | 12.55 | 9.87 |
| 2 | 7 | Secondary | 2072 | 755 | 583 | 0.79 | 7.70 | 20.43 | 13.06 | 9.91 |
| 2 | 8 | Secondary | 2082 | 503 | 396 | 0.80 | 7.63 | 19.46 | 12.42 | 9.66 |
| 2 | 9 | Secondary | 2092 | 1,214 | 1,002 | 0.85 | 7.76 | 19.67 | 12.79 | 9.86 |
| 2 | 10 | Secondary | 2102 | 980 | 803 | 0.84 | 7.53 | 20.21 | 14.13 | 10.05 |
| 2 | 11 | Secondary | 2112 | 3,267 | 2,834 | 0.89 | 6.40 | 23.89 | 23.53 | 11.70 |
| 2 | 12 | Secondary | 2122 | 437 | 274 | 0.65 | 7.10 | 24.82 | 21.77 | 11.82 |
| 3 | 1 | Primary | 3011 | 19,166 | 14,697 | 0.80 | 4.68 | 24.96 | 25.76 | 10.98 |
| 3 | 2 | Primary | 3021 | 18,676 | 15,064 | 0.84 | 4.76 | 24.89 | 25.82 | 11.06 |
| 3 | 3 | Primary | 3031 | 18,817 | 15,966 | 0.88 | 4.87 | 24.81 | 25.79 | 11.13 |
| 3 | 4 | Primary | 3041 | 18,799 | 16,524 | 0.91 | 4.99 | 24.70 | 25.69 | 11.19 |
| 3 | 5 | Primary | 3051 | 18,771 | 17,083 | 0.94 | 5.03 | 24.53 | 25.61 | 11.20 |
| 3 | 6 | Primary | 3061 | 18,811 | 17,400 | 0.95 | 5.03 | 24.32 | 25.49 | 11.16 |
| 3 | 7 | Primary | 3071 | 18,829 | 17,670 | 0.97 | 4.97 | 24.06 | 25.46 | 11.10 |
| 3 | 8 | Primary | 3081 | 18,821 | 18,002 | 0.98 | 4.89 | 23.81 | 25.43 | 11.02 |
| 3 | 9 | Primary | 3091 | 18,840 | 18,188 | 0.99 | 4.82 | 23.58 | 25.37 | 10.95 |
| 3 | 10 | Primary | 3101 | 18,884 | 18,114 | 0.98 | 4.72 | 23.40 | 25.32 | 10.85 |
| 3 | 11 | Primary | 3111 | 18,525 | 15,832 | 0.89 | 4.76 | 24.12 | 25.08 | 10.84 |
| 3 | 12 | Primary | 3121 | 18,405 | 15,007 | 0.85 | 5.03 | 25.01 | 24.81 | 11.01 |
| 3 | 1 | Secondary | 3012 | 390 | 250 | 0.64 | 7.26 | 24.84 | 21.74 | 11.93 |
| 3 | 2 | Secondary | 3022 | 823 | 472 | 0.57 | 7.92 | 24.84 | 19.43 | 11.85 |
| 3 | 3 | Secondary | 3032 | 694 | 404 | 0.58 | 8.08 | 24.67 | 19.16 | 11.89 |
| 3 | 4 | Secondary | 3042 | 615 | 361 | 0.59 | 8.22 | 24.61 | 18.77 | 11.90 |
| 3 | 5 | Secondary | 3052 | 699 | 430 | 0.62 | 8.21 | 24.34 | 18.71 | 11.87 |
| 3 | 6 | Secondary | 3062 | 704 | 485 | 0.69 | 8.04 | 23.86 | 19.01 | 11.81 |
| 3 | 7 | Secondary | 3072 | 734 | 524 | 0.71 | 7.92 | 23.45 | 18.38 | 11.54 |
| 3 | 8 | Secondary | 3082 | 753 | 613 | 0.82 | 7.38 | 22.85 | 18.96 | 11.25 |
| 3 | 9 | Secondary | 3092 | 758 | 653 | 0.86 | 6.71 | 22.21 | 19.82 | 10.94 |
| 3 | 10 | Secondary | 3102 | 668 | 580 | 0.87 | 6.00 | 21.54 | 20.14 | 10.45 |
| 3 | 11 | Secondary | 3112 | 676 | 613 | 0.91 | 5.42 | 20.99 | 20.58 | 10.10 |
| 3 | 12 | Secondary | 3122 | 1,213 | 911 | 0.75 | 5.36 | 21.28 | 20.03 | 9.92 |
| 4 | 12 | Primary | 4001 | 224,429 | 224,540 | 1.02 | 5.45 | 23.53 | 23.83 | 11.03 |
| 5 | 12 | Primary | 5001 | 227,985 | 254,854 | 1.13 | 5.29 | 21.28 | 22.16 | 10.41 |
| 6 | 12 | Primary | 6001 | 228,834 | 213,476 | 0.96 | 4.93 | 22.97 | 24.83 | 10.87 |
| 7 | 12 | Primary | **7001** | **226,783** | **204,387** | **0.90** | **4.79** | **23.36** | **25.34** | **10.91** |
| 8 | 12 | Primary | **8001** | **228,505** | **206,072** | **0.90** | **4.48** | **22.87** | **23.97** | **10.30** |
| 9 | 12 | Primary | **9001** | **114,334** | **114,553** | **1.00** | **4.38** | **23.31** | **24.59** | **10.40** |
| 4 | 12 | Secondary | 4002 | 10,669 | 8,041 | 0.79 | 7.37 | 22.14 | 17.54 | 10.86 |
| 5 | 12 | Secondary | 5002 | 6,667 | 7,098 | 1.07 | 4.34 | 19.36 | 18.07 | 8.57 |
| 6 | 12 | Secondary | 6002 | 7,173 | 5,738 | 0.83 | 3.55 | 18.12 | 16.46 | 7.51 |
| 7 | 12 | Secondary | 7002 | 7,628 | 7,114 | 0.94 | 3.87 | 18.75 | 19.38 | 8.53 |
| 8 | 12 | Secondary | 8002 | 6,801 | 5,952 | 0.89 | 4.23 | 21.46 | 21.96 | 9.55 |
| 9 | 12 | Secondary | 9002 | 9,994 | 9,936 | 1.00 | 4.25 | 23.29 | 21.96 | 9.62 |
| | | | | **blk volume** | **TONNES** | **SG** | **Cr2O3** | **CaO** | **MgO** | **Cr(eq)** |
| | | | | 2,002,333 | 1,920,100 | 0.98 | 5.01 | 23.34 | 24.07 | 10.75 |

# B TECHNICAL APPENDIX – JORC TABLE 1

## Section 1 Sampling Techniques and Data

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

| *Criteria* | *JORC Code explanation* | |
|---|---|---|
| *Sampling techniques* | • *Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.*<br>• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*<br>• *Aspects of the determination of mineralization that are Material to the Public Report.*<br>• *In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralization types (e.g. submarine nodules) may warrant disclosure of detailed information.* | • 1m samples taken throughout unless intersection with basement or major lithological change<br>• Sampling by either core or hollow stem auger<br>• Typically sampling 1/8 of the core was sufficient to produce the required sample weight, where the hollow stem auger was used a ½ or ¼ of the core was sampled.<br>• Samples obtained by manual extraction of material from sample pile by trowel (cone and quarter)<br>• Unsampled material retained as coarse reject |
| *Drilling techniques* | • *Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).* | • Core rig CMV MK 600F which had a diameter of 101 mm;<br>• A truck mounted hollow stem auger rig with a diameter of 63 mm |
| *Drill sample recovery* | • *Method of recording and assessing core and chip sample recoveries and results assessed.*<br>• *Measures taken to maximize sample recovery and ensure representative nature of the samples.*<br>• *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.* | • Core samples were measured for length prior to extraction from the core tube<br>• Auger core was measured in the split-set prior to sampling<br>• Where low recoveries occur they are attributed to water and oversaturated ground<br>• Occasional void spaces due to uneven dumping reduced recovery locally but did not materially impact the overall quality of the drilling<br>• No correlation between recovery and grade was observed |

| *Criteria* | *JORC Code explanation* | |
|---|---|---|
| *Logging* | • *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.*<br>• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.*<br>• *The total length and percentage of the relevant intersections logged.* | • Core was logged for:<br>o Lithology<br>o Grain size<br>o Colour<br>o Material type<br>• Logs recorded on paper in the field and transferred to Excel<br>• All core photographed prior to sampling and logging |
| *Sub-sampling techniques and sample preparation* | • *If core, whether cut or sawn and whether quarter, half or all core taken.*<br>• *If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.*<br>• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*<br>• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*<br>• *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.*<br>• *Whether sample sizes are appropriate to the grain size of the material being sampled.* | • Samples extruded from drill rods, if competent then samples were cut with a trowel into 1/8 or ¼ whichever was most appropriate for obtaining the requisite sample weight<br>• If sample was loose then it was extruded to a rubber mat where a cone and quarter method was used to homogenize and obtain the sample<br>• Umpire samples taken as field duplicates at the same time as the original samples<br>• Appropriateness of sample size to grain size has not been considered for the report |
| *Quality of assay data and laboratory tests* | • *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.*<br>• *For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.*<br>• *Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.* | • All samples dried for 16-20 hrs at 110°C<br>• Samples crushed to 80% passing 2mm<br>• Samples split using laboratory riffle to produce a 250g sample pulverized to 85% passing 74 µm<br>• A total of 862 samples were used in the final resource estimation and a total of 72 QAQC field duplicates and 72 CRM samples submitted which equates to an insertion rate of 17% |

| *Criteria* | *JORC Code explanation* | |
|---|---|---|
| *Verification of sampling and assaying* | • *The verification of significant intersections by either independent or alternative company personnel.*<br>• *The use of twinned holes.*<br>• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*<br>• *Discuss any adjustment to assay data.* | • No verification drilling has been carried out by independent or alternative company personnel<br>• No twinned holes have been drilled<br>• Data handling procedures are documented in the SRK report "***UK5355 SC Wastes Tailings Reprocessing_JORC_v7_Ruds.docx***" |
| *Location of data points* | • *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*<br>• *Specification of the grid system used.*<br>• *Quality and adequacy of topographic control.* | • All data originally surveyed to local Romanian grid<br>• Topographic survey carried out using Topcon and dgps |
| *Data spacing and distribution* | • *Data spacing for reporting of Exploration Results.*<br>• *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.*<br>• *Whether sample compositing has been applied.* | • Drill collars are regularly spaced on a 50m cubic pattern<br>• The results of the geostatistical analysis confirm the 50m spacing is sufficient to establish appropriate levels of confidence of grade continuity for Mineral Resource estimation and classification<br>• Sample compositing has not been applied |
| *Orientation of data in relation to geological structure* | • *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*<br>• *If the relationship between the drilling orientation and the orientation of key mineralized structures is considered to have introduced a sampling bias, this should be assessed and reported if material.* | • The data spacing and distribution is considered appropriate in reducing possible bias, especially when considering the nature of the style of deposition of the WSF material |
| *Sample security* | • *The measures taken to ensure sample security.* | • All samples were collected by the company geologists at the end of each day, samples are stored securely at the gate house office. The only people with access to the core storage is the company geologist, company director, and company security guard.<br>• Once the drill programme was completed all samples were packed into wooden crates under the supervision of the Company geologists and transported overland to ACME Analytical Laboratory Krakow, Poland for sample preparation. Once sample preparation was completed the samples were sent to |

| *Criteria* | *JORC Code explanation* | |
|---|---|---|
| | | ACME Analytical Laboratory ("ACME") in Vancouver.<br>• All crush reject is kept in plastic bags which have been securely fastened; these are stored in the gate house office, in a secure room. The crush reject bags are labelled with BHID, Sample number, From and To, Date, Weight, and the samplers name and signature |
| *Audits or reviews* | • *The results of any audits or reviews of sampling techniques and data.* | • SRK has reviewed the sampling procedures during the February-March 2013 site visit for the Project and is satisfied that industry best practices have been followed. It is SRK's view that the data is adequate for the definition of a grade-tonnage estimate. |

## Section 2 Reporting of Exploration Results

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

| Criteria | JORC Code explanation | |
|---|---|---|
| *Mineral tenement and land tenure status* | • *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.*<br>• *The security of the tenure held at the time of reporting along with any known impediments to obtaining a license to operate in the area.* | • WET has ownership of the land which includes the former BiCapa Chemical Processing site, and associated tailings site. As part of remediation works WET plans to re-process the contents of the former WSF specifically with the aim of extracting Cr2O3, MgO, and CaO. SRK understands that no Mineral Tenure licences or permits have been issued in conjunction with the Bi-Capa site |
| *Exploration done by other parties* | • *Acknowledgment and appraisal of exploration by other parties.* | • No exploration has been carried out previous to the work done by WET |
| *Geology* | • *Deposit type, geological setting and style of mineralization.* | • The source material for the processing of chromite ore was from undisclosed Chromite mining operations in Kazakhstan during the Soviet era. The geology and specific mineralisation of the original ore is not known. Between 1955 and 2001 Dichromate was the primary product. The resultant waste was stabilised with local dolomite brought in from Sfantu Gheorghe by rail cars and converted on site. Waste material from the ore processing facility was pumped as a slurry into two waste storage dams. |
| *Drill hole Information* | • *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*<br>• *easting and northing of the drill hole collar*<br>• *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*<br>• *dip and azimuth of the hole*<br>• *down hole length and interception depth*<br>• *hole length.*<br>• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.* | • A total of 71 holes were drilled for the Resource Estimation averaging a vertical depth of 12m and varying from 7 to 23.5m. all holes were drilled vertically and all holes intersected the clay layer at the base of the WSF.<br>• Given the nature of the deposit the assumption is that all holes encountered potential mineralization from collar to EOH.<br>• Given the short nature of the holes and the style of mineralization, tabulation of hole survey information is not considered material. |

| Criteria | JORC Code explanation | |
|---|---|---|
| *Data aggregation methods* | • *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.*<br>• *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.*<br>• *The assumptions used for any reporting of metal equivalent values should be clearly stated.* | • Standard composite length of 1m was used given the nature and style of drilling. The mineralization does not occur in discrete veins or structures and therefore grades are naturally averaged throughout the drilled interval owing to the nature of the deposition of material to the WSF.<br>• $Cr_{(eq)}$ was calculated based on assumed recoveries and cost/t for Cr, Mg and Ca. The $Cr_{(eq)}$ grade was calculated from the individual elements after estimation into the block model |
| *Relationship between mineralization widths and intercept lengths* | • *These relationships are particularly important in the reporting of Exploration Results.*<br>• *If the geometry of the mineralization with respect to the drill hole angle is known, its nature should be reported.*<br>• *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').* | • Given the nature of the deposition into the WSF there is no apparent relationship between mineralization geometry and the drill angle or intersection lengths. |
| *Diagrams* | • *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.* | • Included in the main report |
| *Balanced reporting* | • *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.* | • Detailed in Section 4.5 of the main report |
| *Other substantive exploration data* | • *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.* | • No additional exploration data is available. |

| Criteria | JORC Code explanation | |
|---|---|---|
| *Further work* | • *The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).*<br>• *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.* | • No additional work is planned and there are no possible extensions, either laterally or at depth, to the deposit owing to the nature of the construction of the WSF |

## Section 3 Estimation and Reporting of Mineral Resources

| Criteria | JORC Code explanation | |
|---|---|---|
| *Database Integrity* | • *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.*<br>• *Data validation procedures used.* | • Validation has consisted of checking for overlaps between adjoining sample intervals, duplication of intervals and holes and confirming that hole surveys are accurate. The report produced by SRK in 2013 has been made available and the data verification carried out by SRK has been reviewed and is considered appropriate allowing the data to be used for the reporting contained herein. |
| *Site Visits* | • *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*<br>• *If no site visits have been undertaken indicate why this is the case.* | • For this current commission SRK has not carried out a site inspection specifically for Mineral Resource estimation.<br>• All data has been provided by WET and their consultants.<br>• Dr Matt Dey and Dr Rob Bowell have visited the site. The Consultant has also had access to previous reports produced on the deposit which describe the drilling and sampling process in detail and provide a detailed overview of the QAQC information obtained from the sampling. This information is summarised in a previous report produced by SRK in 2013 titled "A Grade Tonnage Estimate on the Contained Wastes at the former Bicapa-Tarnaveni Chemical Plant in Judet Mures, Romania" (report # UK5355) |
| *Geological Interpretation* | • *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.*<br>• *Nature of the data used and of any assumptions made.*<br>• *The effect, if any, of alternative interpretations on Mineral Resource estimation.*<br>• *The use of geology in guiding and controlling Mineral Resource estimation.*<br>• *The factors affecting continuity both of grade and geology.* | • Given the deposit is constrained within a manmade waste repository the boundaries of the deposit and its volume are estimated with a high degree of certainty.<br>• The method of deposition and the lack of detailed records preclude the modelling of specific areas of the WSF based on grade of materials being processed at specific times and the deposit is assumed to be a single depositional domain for the purpose of the current study.<br>• The style of deposition onto "beaches" and "deltas" within the WSF has led to the assumption that grade and mineralogy are controlled as a series of overlapping and interdigitating thin horizontal zones with little or no continuity of individual "beds" between the 50m sample spacing |
| *Dimensions* | • *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.* | • The WSF is approximately 500m long and varies from 250 to 330m in width. The depth of the deposited material varies from 7m to 23m with an average thickness of 12m. Mineralization occurs from surface to the base of the WSF. |

| Criteria | JORC Code explanation | |
|---|---|---|
| *Estimation and Modelling Techniques* | • *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software & parameters.*<br>• *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource Estimate takes appropriate account of such data.*<br>• *The assumptions made regarding recovery of by-products.*<br>• *Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulfur for AMD characterisation).*<br>• *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.*<br>• *Any assumptions behind modelling of selective mining units.*<br>• *Any assumptions about correlation between variables.*<br>• *Description of how the geological interpretation was used to control the resource estimates.*<br>• *Discussion of basis for using or not using grade cutting or capping.*<br>• *The process of validation, the checking process used, the comparison of model data to drillhole data, and use of reconciliation data if available.* | • Grade modelling was carried out using ordinary kriging. Snowden Supervisor ® was used for data analysis, variogram modelling and KNA (neighbourhood analysis), Surpac software ® was used for grade estimation and block model construction.<br>• Variogram analysis of all three products (Cr, Mg, Ca) highlighted a range of between 100-120m with very little anisotropy. A circular range of 120m was utilized for the final kriging with a vertical range of 8m.<br>• 1m composites were used with a minimum of 8 and maximum of 24 used for each block interpolation, no restrictions were placed on the number of samples available from individual holes but the restricted vertical search ensured that multiple holes were generally used for interpolation.<br>• Block size was set at 8x8x4m<br>• All interpolation was carried out in a single pass with the entire WSF regarded as a single domain<br>• No previous estimates were available and mine production records are not valid for the deposit.<br>• Estimation was restricted to only Cr, Mg and Ca elements and a calculation based on recoveries from testwork was used for calculating a $Cr_{(eq)}$ grade.<br>• No grade cutting was used. The Cr and Mg data show a positive and negatively skewed population respectively. However domain analysis of the outliers for both elements show the outliers occur as discrete zones within the WSF and, although too small to be interpolated as separate domains these zones are considered to represent areas of higher and lower grade rather than a random distribution of high grade outliers.<br>• No reconciliation data is available. The block model was validated against swath plots in the X, Y and Z orientations and by comparison between the original data histograms with those derived from the resultant block models |
| *Moisture* | • *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.* | • Tonnages are estimated using a dry density |
| *Cut-off Parameters* | • *The basis of the adopted cut-off grade(s) or quality parameters applied.* | • No cut off grade is used for reporting (0.0 %) as the mining licence calls for all material within the WSF to be removed and processed |

| Criteria | JORC Code explanation | |
|---|---|---|
| *Mining Factors or Assumptions* | • *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.* | • As all material is to be removed there is no estimated mining loss or dilution applied to the mining assumptions. Mining will be by excavator and truck as the material is loose tailings there is no requirement for blasting or ripping. |
| *Metallurgical Factors or Assumptions* | • *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.* | • The metallurgical factors used for the recovery values applied to the $Cr_{(eq)}$ calculation were derived from the results of testwork reviewed and audited by SRK Consulting as follows: Cr recovery 77.4%; Mg recovery 64%; Ca recovery 63.5%. |
| *Environmental Factors or Assumptions* | • *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.* | • |
| *Bulk Density* | • *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.*<br>• *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vughs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.*<br>• *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.* | • The density analysis takes into account core loss due to enhanced moisture in areas of the WSF. There are unlikely to be void spaces within the body of the WSF but certain areas of the WSF are known to be higher in moisture due to the style of deposition of the material during operation of the facility.<br>• Density has been estimated into the block model as a unique variable for each block allowing estimation of tonnages to be made as part of the monthly production scenarios. |

| Criteria | JORC Code explanation | |
|---|---|---|
| *Classification* | • *The basis for the classification of the Mineral Resources into varying confidence categories.*<br>• *Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).*<br>• *Whether the result appropriately reflects the Competent Person's view of the deposit.* | • Given the robust nature of the semi-variograms and the close and regular spacing of the evaluation drillholes, it was considered appropriate to classify the resulting Mineral Resource as Indicated. The high slope of regression allied with the confidence implied from both the KNA and block validation analysis and coupled with the perceived continuity of grade within distinct areas of the WSF, lead the author to conclude that an Indicated category is appropriate. |
| *Audits or Reviews* | • *The results of any audits or reviews of Mineral Resource Estimates.* | • The methodology and results of the current Mineral Resource estimate have been reviewed by Mr Martin Pittuck of SRK Consulting |
| *Discussion of Relative Accuracy/ Confidence* | • *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource Estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.*<br>• *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.*<br>• *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.* | • The CP considers the accuracy and confidence in the Mineral Resource estimate to be at a level commensurate with applying an Indicated category to the entire WSF resource.<br>• While the horizontal directional variograms are at the limit of their modelable range given the 50m spacing and 120m range, the downhole variograms provide a highly robust estimate of the nugget variance to be approximately 30% of the total data variance for all three variables.<br>• Validation of the block model shows that the block grade distribution show good correlation with the general trends highlighted in the drilling results<br>• No production or reconciliation data is available at this stage of the project as mining of the WSF has yet to commence |

# APPENDIX

# B CONSENT FORM

Dr John Arthur
Geological and Mineral Resource Consulting Services
Mobile: +44 (0) 7841 800 103 | Email: jarthur42@gmail.com | Skype: johnarthur42

## Competent Person's Consent Form

Pursuant to the requirements of ASX Listing Rules 5.6, 5.22 and 5.24 and Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

### Report name

COMPETENT PERSONS REPORT, WASTES ECOTECH SRL - CHROMIUM RECOVERY PROJECT, TÂRNĂVENI, JUDET MURES, ROMANIA

(*Insert name or heading of Report to be publicly released*) ('Report')

**SRK Consulting (UK) Limited**

(*Insert name of company releasing the Report)*

**Former Bicapa Tarnaveni Chemical Works Waste Storage Facility**

*(Insert name of the deposit to which the Report refers)*

If there is insufficient space, complete the following sheet and sign it in the same manner as this original sheet.

1st May 2020

*(Date of Report)*

## Statement

I

**Dr. John Arthur**

(*Insert full name(s)*)

confirm that I am the Competent Person for the Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member or Fellow of *The Australasian Institute of Mining and Metallurgy* or the *Australian Institute of Geoscientists* or a 'Recognised Professional Organisation' (RPO) included in a list promulgated by ASX from time to time.
- I have reviewed the Report to which this Consent Statement applies.

I am a full time employee of

*(Insert company name)*

Or

I am a consultant working for

**SRK Consulting (UK) Limited**

*(Insert company name)*

and have been engaged by

**SRK Consulting (UK) Limited**

*(Insert company name)*

to prepare the documentation for

**Former Bicapa Tarnaveni Chemical Works Waste Storage Facility**

*(Insert deposit name)*

on which the Report is based, for the period ended

**31 March 2019**

*(Insert date of Resource/Reserve statement)*

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

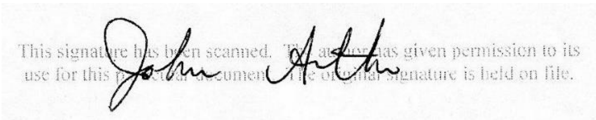
I verify that the Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to Exploration Results and Mineral Resources.

# Consent

I consent to the release of the Report and this Consent Statement by the directors of:

**SRK Consulting (UK) Limited**

*(Insert reporting company name)*




**14 February 2020**

Signature of Competent Person:

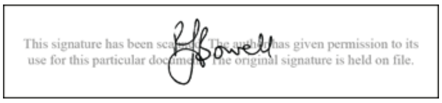
Date:

**Geological Society of London**

**1005744**

Professional Membership:

Membership Number:




**Robert Bowell, Lyndhurst (UK)**

Signature of Witness:

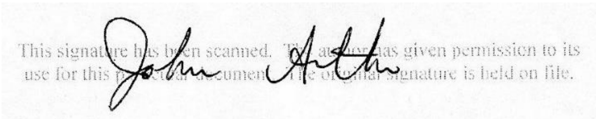
Print Witness Name and Residence:
(eg town/suburb)

Additional deposits covered by the Report for which the Competent Person signing this form is accepting responsibility:

**None**

Additional Reports related to the deposit for which the Competent Person signing this form is accepting responsibility:

**None**



**14 February 2020**

Signature of Competent Person:

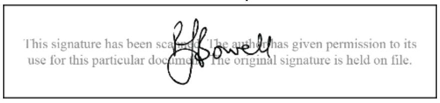
Date:

**Geological Society of London**

Professional Membership:

**1005744**

Membership Number:



**Robert Bowell, Lyndhurst (UK)**

Signature of Witness:

Print Witness Name and Residence:
(eg town/suburb)

# APPENDIX

# C WET REPORT – EXISTING WSF LINING MEMO

## *Wastes EcoTech Srl Memorandum:*

## *The former Bicapa Târnăveni Works Bichromate Waste Impound Lining*

8th April 2020

Despite extensive searches there is no documented detail of how the bichromate waste impoundment at the former Bicapa Târnăveni was built. However, through Stefan Komavies, the general manager of the former Bicapa works, Wastes EcoTech Srl (WET) have made contact with Octavian Popa, the former head of project investment during the construction of the WSF, on the 3rd April 2020.

He stated that *"when they were built (the initial 3 batals/waste impoundments, Cells 1, 2 and 3), the topsoil was stripped, the base was marked up and the old riverbed was filled with local soils. 6m deep slurry walls were then built – one runs the 25 m inside from the centre of the southern retaining dyke and the length of the river side for batals 1, 2 and 3. Then there are further 6 m deep slurry walls running from the river side slurry walls (intersecting) to the northern (factory side) dyke that separate batals 1, 2 and 3 (there is no slurry wall on the northern perimeter). Once the slurry walls were done, the area was levelled and a base layer was constructed between 30 to 40 cm deep. This was completed by stripping the alluvium clay sediments to a depth of 30 to 40 cm and mixing it together with 30%w/w alumina. This was then spread across the base. The base was compacted and humidified and left to dry over 3 months during which it developed a hard pan surface. The dykes were built up from clay from the hill across the road and was effectively the overburden from what is now the former quarry."*

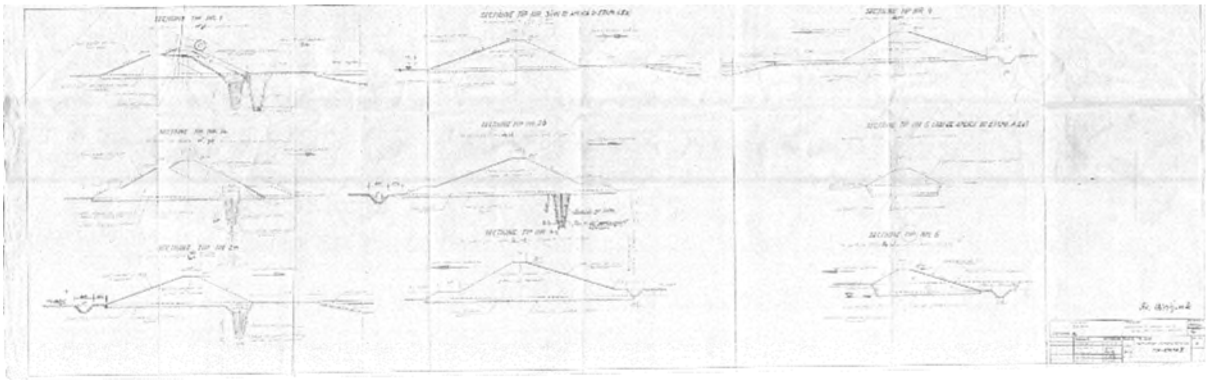


Figure 1: Cross section plans from 1971 for the former Bicapa Târnăveni works proposed waste impoundment. The 6m deep slurry walls can be seen within the outer retaining dykes but are eventually covered by the dyke.

The initial preparation stages can be seen in Cell 4, that was abandoned part way through construction. Here the topsoil has been stripped and the site levelled. Starter retaining dykes are partially constructed on the perimeter of the cell. This is in accordance with the original process described above.

Figure 2: Photo of Cell 4

Running through Cell 4 a drainage was constructed to drain waters from Cell 4 back to the main site drainage system. Figure 3 shows this channel and illustrates how the local clay alluvium retains some of the chromium salts. However, if you look at the start of the channel, on the left-hand side, there is some disturbed ground in the channel, and although there is evidence of chromium salts either side of this section, there are no visible chromium salts within the disturbed ground. Thereby implying that the chromium salt contamination can be contained by this material.

Figure 3: Chromium salt enriched drainage channel in Cell 4. Note the chromium salts retained by the clay alluviums along the length of the channel.

Finally, in 2017 FRW were commissioned to sink 2 hydrological monitoring boreholes at the former works site. One was near the waste impoundment and the former bichromate factory, the other was in the north of the site near to the outskirts of Târnăveni. Both boreholes recorded about made ground followed by 3 to 4 m of dry clays, both holes reached the water table at about 3.8 m. After the clay formations a fine sandy, clay is recorded.

Further evidence of the continuation of the clays across the site can also be seen in the drainage channel across cell 4. This channel is approximately 400 m long and is nearly 1 m deep. The alluvial clays are consistent along its length.

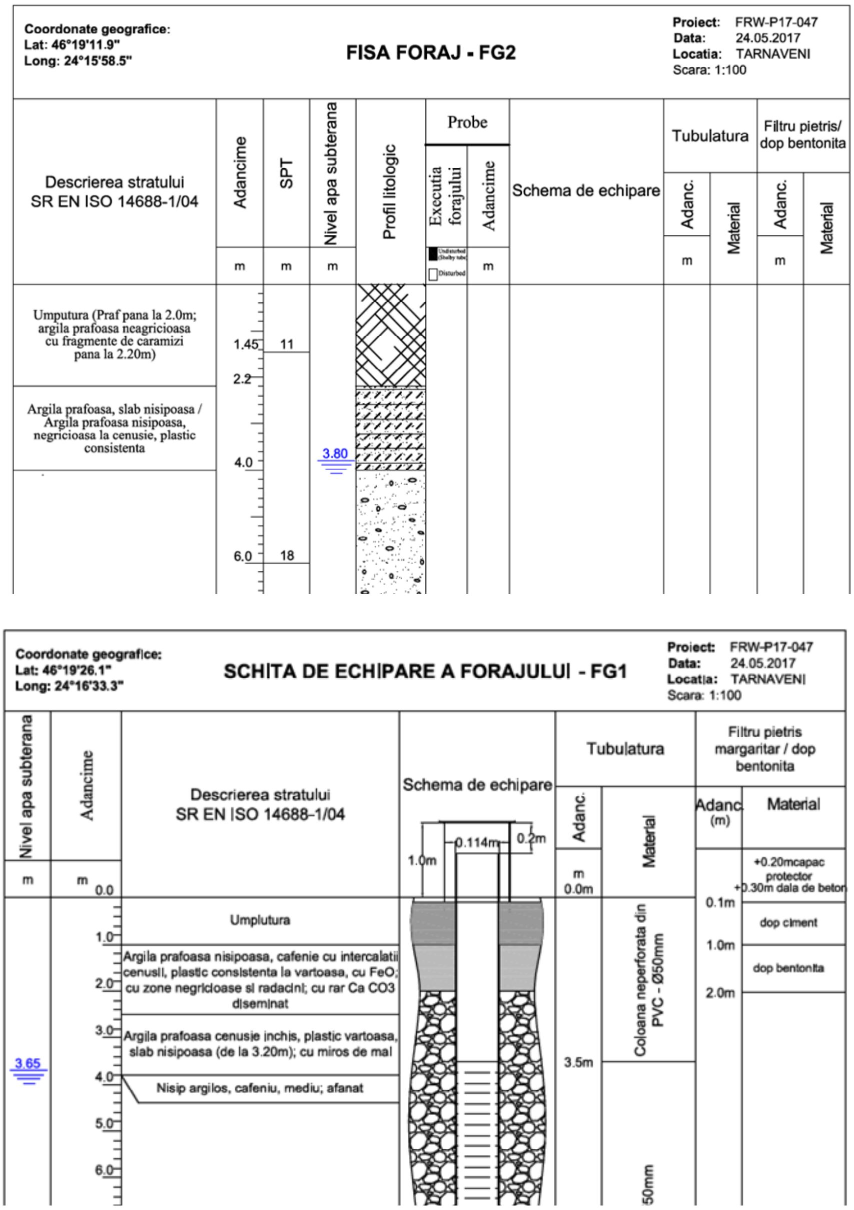



Figure 4: Borehole logs from the 2 sites on the form Târnăveni works, FG2 was near the former bichromate plant, north of the WSF, and FG1 was in the north east of the site near the rail line. The upper layers are dry clays (argila)

From this information WET would propose that the existing WSF probably has:

1. an underlying bed of over 3 m of alluvial clay, that is suitable for retaining the chromium salt contamination,
2. there was a 0.3 to 0.4 m engineered surface, but this is no longer evident in the exploration boreholes, and,
3. the perimeter of the WSF is surrounded by clay retaining dykes, that are tied into a 6 m deep slurry wall.

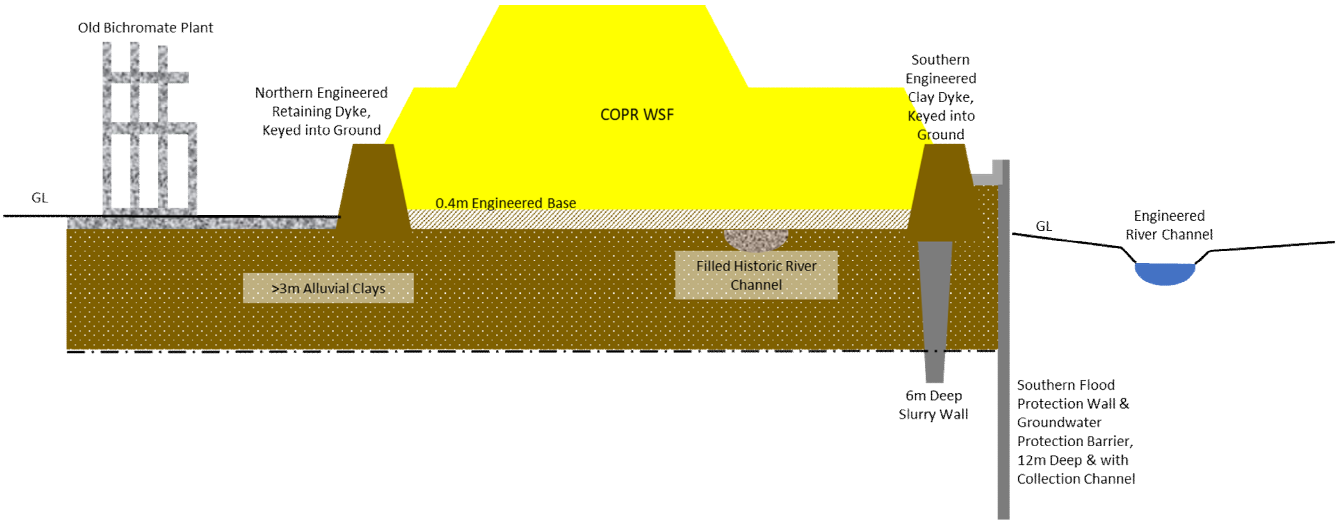



Figure 5 Cross section of COPR WSF, with key engineered features

# APPENDIX

# D WET REPORT – SUMMARY OF PROPRIETARY CHROME GREEN RECOVERY PROCESS LICENSE AGREEMENT

*wastes ecotech srl*

# *Wastes EcoTech Srl Memorandum:*

## *The former Bicapa Târnăveni Works - Chrome Green Licence Agreement*

## *PR - Appendix 11f) - Chrome Green Licence Summary*.

20th April 2020

WET has entered into a licence agreement for the proprietary Chrome Oxide Green process with Prof Ion Peleanu (IP), which has a 2-step commitment. IP has developed an approach to convert the chromium VI streams from the Ion Exchange systems into a high purity Chrome Oxide Green product.

WET has agreed to a 'know-how contract' (Part 1) and for which a fee is to be paid on receipt of the CPR document. The know-how is based on the IP method developed and is regulated under contract CCK-H/11.04.2018 Within this contract IP had to provide the know-how and experimental protocols to allow WET to undertake trials as proof of technology. Additionally, IP was required to arrange the 3rd party testing facility and provide assistance in the experimental trials as well as method statements, provide reagent consumption and energy use rates to enable completion of the WET TEM.

Content of the know-how can be found in the ***WET Process Report : PR - Appendix 11f) - Chrome Green Process Summary***.

Part 2 of the agreement is regulated by a second contract (CL-11.04.2018), which is the effective licencing agreement, and is based on IP obtaining a Patent for his know-how. WET has agreed on a one-off fee for the use of the knowledge in conjunction of the patent. The fee is payable only on start of production and assumes the Patent has been issued. It is valid for the WET Tarnaveni site and is a single fee payment for the life of the project. No ongoing tonnage-based fees are payable.

Should WET not use the know-how, by using an alternative route, then this contract has no validity and hence no fee is applicable.

WET has budgeted payment of the fee (USD 100k) within the TEM under ITEM # 58 within the CapEx budget.

Both contracts are available to be reviewed on condition of signature of an NDA for this to protect the IP rights whilst the know-how undergoes the patent review process with the European Patent Office.