

Certified Trading Chains Pilot Project Rwanda

Report on Developing the Record Management System Standard



BGR

Bundesanstalt für
Geowissenschaften
und Rohstoffe



**OGMR: Rwanda
Geology and Mine
Authority**

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About

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Acronyms

AFP	Analytical Fingerprinting
AS	Alex Stewart
ASM	Artisanal and Small-scale Mining
BGR	Federal Institute for Geosciences and Natural Resources
CoC	Chain of Custody
CTC	Certified Trading Chain
DRC	Democratic Republic of Congo
ETI	Euro-Trade International
GMC	Gatumba Mining Concession
HF	Historic Futures
ITRI	International Tin Research Institute
iTSCi	ITRI Tin Supply Chain Initiative
MS	My String
MSA	Minerals Supply Africa
MSC	Malaysia Smelting Company
NRD	Natural Resource Development Rwanda Ltd
OGMR	Rwanda Geology and Mines Authority
RRA	Rwanda Revenue Authority
RCS	Resource Consulting Services
RFID	Radio Frequency Identification Tag
RMMLC	Refractory Metals Mining Ltd
USAID	United-States Agency for International Development
WBH	Wolfram Bergbau and Huteen Gesellschaft
WMP	Wolfram Mining and Processing Ltd

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Executive Summary

The “Office de la Géologie et des Mines du Rwanda” (OGMR) and the German Federal Institute for Geosciences and Natural Resources (BGR) agreed to undertake a technical cooperation program in 2009 to strengthen the competitiveness of the Rwandan mineral sector by developing best practice and enhancing transparency.

The program is of international relevance: in July 2010, the US Congress passed a financial reform bill with the inclusion of a key provision on conflict minerals that concerns the Democratic Republic of the Congo (DRC) but also adjoining countries such as Rwanda. The legislation requires SEC listed companies which import minerals from DRC and adjoining countries in Africa to provide proof that the minerals in their products are ‘DRC conflict-free’. In this context, certification schemes such as the Certified Trading Chain (CTC) initiative are of particular relevance.

The joint program “Pilot Project for Building Best Practice in Rwandan Mineral Production” has the following objective and indicators:

Objective: The participating pilot mine sites in Rwanda are upgraded to the level of internationally accepted norms and standards by the instrument of CTC.

- **Indicator 1:** A final audit verifies that activities at the pilot mine sites are in compliance with the relevant standards.
- **Indicator 2:** The production volume of minerals from the pilot mine sites as well as the trading chain of the minerals are traceable.

Four mining companies, namely Euro-Trade International (ETI), Gatumba Mining Concession (GMC), Natural Resources Development Rwanda Ltd (NRD), and Wolfram Mining and Processing Ltd (WMP), participated as pilot companies to implement the project and develop a record keeping system that allows the efficient and systematic control of the creation, receipt, maintenance, use and disposition of records, which have to be kept to prove compliance with the CTC Standard Set.

In line with the second indicator above, BGR hired RCS to conduct a study and provide implementation support to companies participating in the pilot project to ensure that the production material from the participating mines was traceable from the point of extraction to point of export. The primary focus of this work was the following:

- To provide a study detailing the record keeping systems currently in place among CTC Pilot companies to record mineral production and transport.
- To suggest improvements/alternatives to current systems to ensure traceability of the minerals.

- To assist and advise the CTC Pilot companies on how to implement a system of traceability.

The research identified a three-stage (i.e. Mine premises, Transport and Trader, Trader’s aggregation and Export) general trading chain that summarises the stakeholders, activities and records involved at each stage. The research identified a number of key issues which were common to all CTC Pilot companies and which the recommended CTC record-keeping standard addresses:

1. Continuity of information along the supply chain

- a. Data should travel with the material so that information on source and movements can be disclosed at any point in the supply chain.

2. Information Management

- a. Data should be stored in a central location for at least five years and information management systems should be put in place.
- b. Data should be converted into electronic format as soon as possible to ensure proper information management.

3. Traceability of material (where aggregation of material occurs)

- a. Assurance in the supply chain requires that material be able to be traced back to the origin of the material even after aggregation.

4. Reporting (who has oversight)

- a. Records need to be submitted regularly and uniformly and the regulatory body must have an information management system.

In addition to the issues identified relating to the record keeping systems of the companies, a number of additional components were also identified based on the specific situations of the CTC pilot companies in Rwanda.

1. The Standard should be able to be applied using both paper and electronic recording of documents to account for varying capacity among companies.

The different requirements/characteristics and degrees of sophistication of the companies (e.g. computer literacy; access to the electric grid; internal management systems/software etc) warrants variation in the system in order to meet and mitigate the key deficiencies identified.

2. However, as there will be significant records generated, **these must become electronic as early as possible in the supply chain to ensure that the production of data remains manageable.**

3. The Standard should be cost effective and able to be implemented by less capitalised companies

4. Where possible, **the Standard should rely upon data that is already generated by the companies, rather than creating another layer of bureaucracy.** It should also be noted that the system suggested below contains information/data already used by and required from companies and complemented only with additional information that is deemed necessary for the purposes of the CTC.

5. **The Standard should enable efficient oversight by regulatory authorities, independent auditors and investors/buyers.** For instance, should OGMR fulfil this function, it should obtain enough data and information that allows it to have effective oversight over the system where required as well as build its knowledge base of the sector.

6. Because the purpose of the CTC scheme is to guarantee transparency and traceability of the material, the **Standard should ensure that (sufficient and not necessarily all) information is available to all stakeholders in the supply chain and that source data travels with the minerals.** The Standard should ensure continuity of data in such a way that information relative to the mineral travels along with the mineral itself, either physically and/or electronically.

The proposed solution to the issues above is a 'CTC passport' which enables the production, carriage and storage of

information along the entire supply chain. The passport pages include information such as the weight, origin, analysis, date of production, and would be generated where material is first produced, then aggregated, and finally exported. Pages are generated at the following points:

1. Production
2. First Aggregation
3. Second Aggregation
4. Export

This system must be complemented by a computer-based platform which emulates the functions fulfilled by the passport and that replicates most of the data that is input. The use of an internet-based software to fulfil this role is ideal. These programmes provide online traceability services for the whole supply chain (provided all actors/control points in it have an active account) and are designed to create a virtual data chain alongside the physical product chain.

Finally, due consideration must be given to the regulatory body that oversees the CTC system in Rwanda and elsewhere. In particular we note that should the regulatory body be OGMR, then significant capacity building is required in order that the body can effectively provide oversight of this system. Ideally, automated systems of reporting will be built into computerised electronic record systems that companies adopt. However, in order for them to do so, there must be continued input from OGMR during the design of this next phase.

General Recommendations¹

Based on the research conducted in Rwanda, as well as extensive discussions with pilot companies and other stakeholders, we present the following recommendations over and above the Standard-Specific recommendations above.

1. Conducting a pilot of the implementation of these standards is crucial to the future success of the CTC. We recommend that a company be chosen to pilot the record keeping system, and roll out of the electronic component. Alternatively, if conditions allow it, it would be fruitful to pilot the CTC on a range of companies with varying conditions (Human Resources, Finance, Logistics, etc) in order to be more representative of circumstances on which the CTC will build.
2. This pilot program should include the regulator so that effective oversight of the CTC standard should be factored into the system during the design phase. Should OGMR become the regulator, then it should review its capacity to oversee the CTC project and decide on an independent third party to audit the CTC scheme. The regulator should receive technical advice on the oversight and implementation of the scheme.
3. The passport documentation should be integrated into companies' record keeping systems to become one of the management tools of the company. Integration will ensure that the information that is generated is compatible with other data produced by the company.
4. Traceability must start at the earliest point possible and be carried through the entire supply chain. We have suggested a system here to do so. Nevertheless, the system will have to be adapted for each company. We recommend that the regulator eventually reviews and approves each company's system in order to ensure compatibility with the objectives of the CTC Standard. This includes whether it is more appropriate to start recording data from the sub-contractor point or from tunnels once operations become more industrialised.

¹ The CTC project concerns mining companies not the artisanal sector.

Part I: Introduction

Goal and Motivation of Study

The “Office de la Géologie et des Mines du Rwanda” (OGMR) and the Federal Institute for Geosciences and Natural Resources (BGR) agreed to undertake a technical cooperation program in 2009 to strengthen the competitiveness of the Rwandan mineral sector by developing best practice and enhancing transparency.

The joint program “Pilot Project for Building Best Practice in Rwandan Mineral Production” has the following objective and indicators:

Objective: The participating pilot mine sites in Rwanda are upgraded to the level of internationally accepted norms and standards by the instrument of CTC.

- **Indicator 1:** A final audit verifies that activities at the pilot mine sites are in compliance with the relevant standards.
- **Indicator 2:** The production volume of minerals from the pilot mine sites as well as the trading chain of the minerals are traceable.

In line with indicator 2 above, BGR hired Resource Consulting Services (RCS) to conduct a study and provide implementation support to companies participating in the pilot project to ensure that the production material from the participating mines was traceable from the point of extraction to point of export. The primary focus of this work was the following:

1. To provide a study detailing the record keeping systems currently in place among CTC Pilot companies to record mineral production and transport.
2. To suggest improvements/alternatives to current systems to ensure traceability of the minerals.
3. To assist and advise the CTC Pilot companies to implement a system of traceability.

In this context, the pilot companies, namely Euro Trade International (ETI), Gatumba Mining Concession (GMC), Natural Resources Development Rwanda Ltd (NRD), and Wolfram Mining and Processing Ltd (WMP), need to develop a record keeping system that allows the efficient and systematic control of the creation, receipt, maintenance, use and disposition of records, which have to be kept to prove compliance with the

Box 1: Impact of the US legislation on mining industries in Central Africa

There has been a growing interest in certification schemes and in particular in the CTC scheme since the US Congress has passed a financial reform bill with the inclusion of a key provision on conflict minerals that concerns DRC and surrounding countries such as Rwanda. The law clearly illustrates the international relevance of the CTC scheme.

The Act was signed into Law by the President of the United States (US) on 21 July 2010. The Act, among (many) other things, amends section 13 of the Securities Exchange Act of 1934. This amendment requires companies reporting to the SEC to file periodic reports disclosing their use of ‘conflict minerals’. Columbite-tantalite (coltan), cassiterite, gold, wolframite and their derivatives are all ‘conflict minerals’ within the meaning of the Act.

This reporting requirement applies only to SEC reporting companies; which are companies with more than \$10 million in assets whose securities are held by more than 500 owners. As such, the new reporting requirements are unlikely to directly apply to smaller companies further down the supply chain, such as mineral traders in the DRC. However, it is likely that the regulations will apply to many end users, such as electronics companies, which may request the necessary information from their suppliers to be able to demonstrate compliance with the new reporting requirements. The standard of proof required to verify this information has yet to be established by the SEC.

The new reporting requirements are to disclose whether any ‘conflict mineral’ used in the production or functionality of any products originated in the DRC or an ‘adjoining country’. If such ‘conflict mineral’ did originate from the DRC or an ‘adjoining country’, then SEC reporting companies have to submit to the SEC a report that includes:

1. a description of the measures taken by the Reporting Company to exercise due diligence on the source and chain of custody of the ‘conflict minerals’;
2. a description of the products (whether manufactured by the Reporting Company or manufactured for it by a contactor) that contain ‘conflict minerals’ originating from the DRC or an ‘adjoining country’;
3. the name of the entity that conducted the audit described below;
4. a description of the facilities used to process the ‘conflict minerals’;
5. the country of origin of the ‘conflict minerals’; and
6. a description of the efforts employed by the Reporting Company to determine the mine or location of origin of the ‘conflict minerals’ with the greatest possible specificity.

CTC Standard Set. In particular, the system should provide standard processes for capturing and maintaining evidence of and information about origin of products, production, transport, storage and trading of minerals as valid records for evidence.

RCS has been commissioned by BGR to assist these pilot mining companies by competent support and revision of their working processes. RCS' task has been to elaborate a template for a CTC Standards Set management system that can be further customised by the four pilot mining companies and to ensure that the CTC Standards Set management system is implemented.

Methodology

The primary focus of this work was the following:

1. To provide a study detailing the record keeping systems currently in place among CTC Pilot companies to record mineral production and transport.
2. To suggest improvements/alternatives to current systems to ensure traceability of the minerals.
3. To assist and advise the CTC Pilot companies to implement a system of traceability.

The RCS team spent a number of weeks in Rwanda conducting primary research with CTC companies in order to understand the current record keeping systems in place. The focus of this initial investigation was to understand the type of information that mining companies keep about the origin of products, the production, the transport, the storage and the trading of minerals, as valid record for evidence. The consultants have tried to identify the exact process of the trading and supply chain and the documents recorded at each stage. In order to do so, they have based their guidance on the findings of the baseline audits and have complemented their research by:

- Submitting a questionnaire to the companies to fill knowledge gaps about their record-keeping systems
- Interviewing:
 - General Managers

- Operation Managers
- Mine Supervisors
- Traders
- Independent laboratory Alex Stewart
- OGMR staff
- Trading Coordinator of the Ministry of Commerce
- Customs Officer
- Visiting mining concessions (Nemba, Rutsiro, Gatumba, Gifurwe, and Rutongo)
- Visiting mining companies' head offices.

After a first phase of research and analysis, RCS consolidated the information and identified gaps in the record keeping procedures which were an impediment to the integrity of the supply chain and thus, the traceability of material from point of extraction to point of export. The consultants then developed an alternative record keeping system based on the best practise procedures of CTC pilot companies as well as drawing from international best practise in certification and record keeping.

Finally, in order to provide on the ground assistance, RCS was based in Rwanda for a number of weeks and held numerous workshops and meetings with relevant stakeholders (but particularly Pilot companies and OGMR) to define the record keeping procedures for the CTC pilot project. Workshops included a collective workshop to discuss findings and suggestions, as well as individual workshops with Pilot Company general managers and key staff to help each company to implement the CTC system adapted to their specific needs.

Timetable

The consultants conducted the research both at their home base as well as spending considerable time in Rwanda in order to conduct research and provide hands-on advisory to the Pilot companies. Please see Box 2 below for the division of time for the project:

Box 2: Division of time for CTC project						
Week 1- 3 (starting May 31st, 2010)	Week 4 (starting on Monday 21 June 2010)	Week 5 (starting on Monday 28 June 2010)	Week 6 (starting on Monday 5th July 2010)	Week 7 (starting on Monday 19 July 2010)	Week 8 (starting on Monday 26 July 2010)	Week 9 (starting 2nd August 2010)
Desk-based research	Interviews	Interviews	Interviews	Company Workshops	Company Workshops	Report-Writing
Questionnaires designed, sent and analysed	Mine site visits	Mine site visits	Data analysis	Development of company policies and standards	Embassy meetings Report compilation	

Part II: Findings and Analysis

General Background to Certification and Assurance Systems

Certification schemes are typically designed to assure one of four main objectives:²

1. Origin/Chain of custody
2. Management systems
3. Process and Production methods
4. Product/Manufacturing quality

The CTC scheme is primarily concerned with objectives 1, 2 and 3 above. This study, however, is solely concerned with objective 1 – to assure and certify the chain of custody. CTC is one of a number of certification schemes that have been proposed for minerals in the Great Lakes region.

In the context of so-called ‘conflict minerals’ coming from the Eastern DRC, certification systems serve as an alternative to a wholesale export bans on natural resources that are costly and difficult to enforce. Unlike sanctions, certification is managed by the companies who seek to demonstrate to those in the commodity chain that the commodity has been produced in a responsible way. Thus, certification primarily depends upon a proactive process of internal professionalization by companies (and oversight bodies) party to the scheme to meet the requirements, rather than in response to regulations imposed by government.

Box 3 gives the example of the ITRI certification scheme currently in development in the DRC. This scheme can provide insight to the development of record keeping in the CTC system but there is a notable difference between ITRI and CTC as in the origin of minerals. ITRI member’s minerals derive from unaffiliated artisanal mines and pass through a number of hands; this makes the scheme necessarily ambitious in scope with different systems of tagging/certification required depending on the point in the supply chain (see Figure 1 below). In contrast, the minerals in the CTC scheme derive from the pilot company’s concessions, making traceability immediately easier.

Box 3: Lessons from Certification – the ITRI Scheme

The International Tin Research Institute (ITRI) launched a Tin Supply Chain (iTSCi) scheme in the Democratic Republic of Congo (DRC) that aims at ensuring the traceability of the tin supply chain so that production areas can be identified and managed.³ Its goal is to assure cassiterite as conflict-free by verifying origin and ensuring the integrity of the supply chain along the way. Since July 2009 ITRI has been working on the implementation of the first phase of a due diligence plan for tin minerals sourced from Eastern DRC and written documentation has to be provided with each shipment of cassiterite originated in the DRC. Compliance is assessed through yearly independent audits (see Figure 1 below for the type of data that is generated and transferred with the iTSCi).

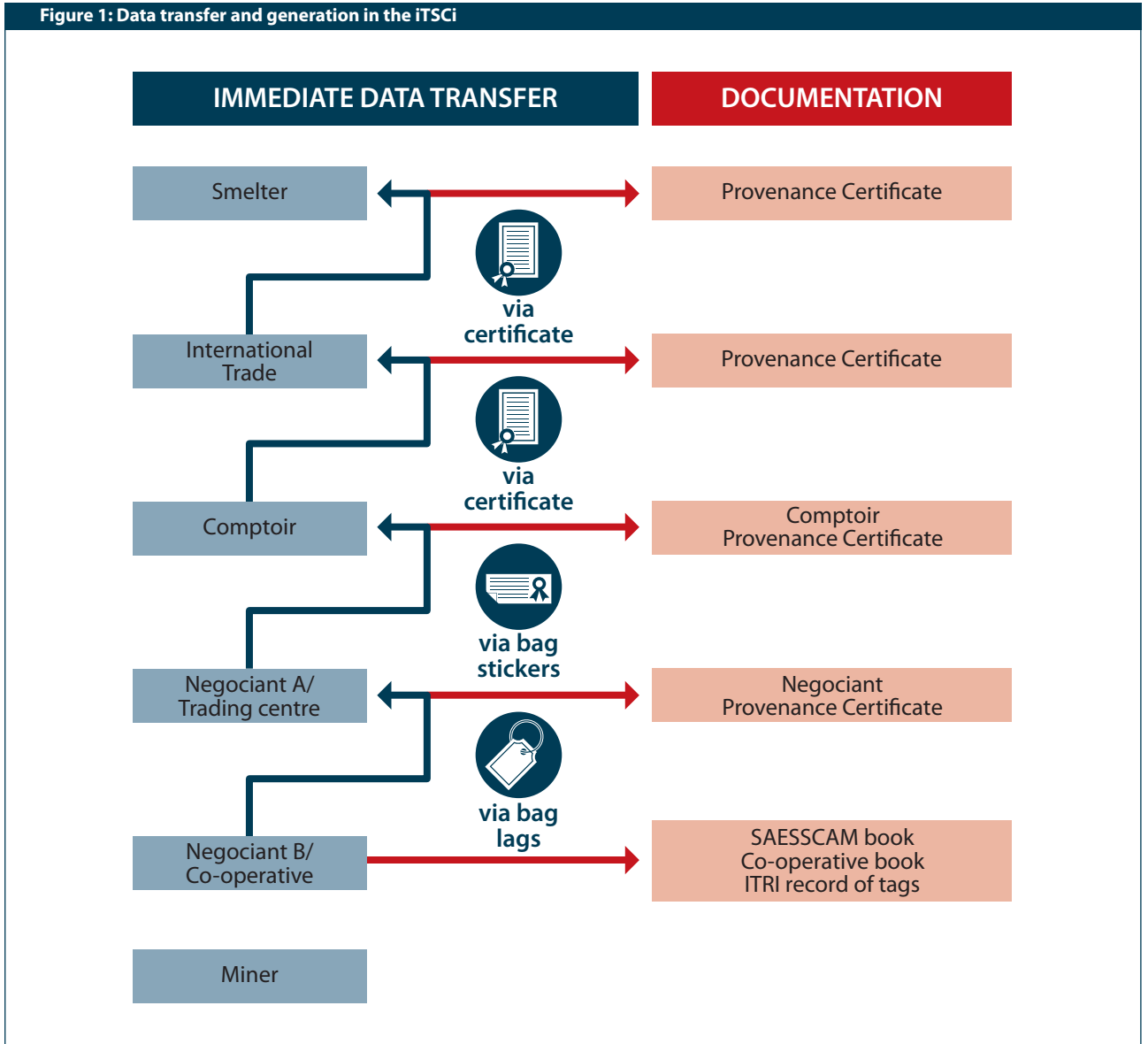
Phase 2 of the project, which started in March 2010, includes means to determine which mineral production areas or trading routes are under the influence of rebel groups or considered to be unacceptable sources for any other reason. The aim of this phase is to establish a system of traceability from mine to comptoir through a system of unique numbering associated with specific mine sites. Reference numbers are to be consolidated at each trading step as material passes up the supply chain. Material without a suitable tag should not be purchased by négociants or comptoirs and various penalties may be applied for issues identified via cross checks. Phase 2 of the iTSCi is a traceability scheme and should not be considered a certification scheme. Rather, the system is designed to complement existing laws and mining regulations with the DRC and contribute to capacity building and training of relevant DRC government services.

In September 2010, ITRI and the Rwandan Geology and Mines Authority (OGMR) announced plans to co-operate in order to implement the ITRI scheme (Phase 2) for cassiterite as well as other minerals produced in Rwanda. This builds on the iTSCi Phase 1 document collection requirement that are in place since July 2009, as well as a pilot project for Phase 2 which has been in effect at Kalimbi in eastern DRC over the last few months. The first site to adopt the iTSCi process in Rwanda will be Rutongo Mines Ltd a cassiterite mine operated by Ruddington; a major investor and the largest producer of cassiterite within Rwanda and employer of over 3000 people.

² Levin, E., (2008) ‘Clarifying certification: Language, Components and Process’, Annual CASM conference

³ ‘iTSCi’ ITRI Tin Supply Chain Initiative SUMMARY October 2009

Figure 1: Data transfer and generation in the iTSCI



Source: ITRI

Commonalities in Record Keeping

Based on a review of the ITRI and other certification schemes such as the Kimberley Process Certification Scheme for Rough Diamonds, we have identified a number of commonalities in record-keeping which are helpful in the development of the CTC system.

Figure 2 below neatly summarises the transformation of data from the field to base and from paper to electronic. In this figure, data becomes information through the production of mandatory documents – in the case of CTC, this would be a certificate which details the origin of minerals and all other parts of the supply chain.

When 'field data' is generated by a mining company under 'paper forms' (usually data relative to weights, point of extraction, name/number of sub-contractors, tunnel, property of the material, etc), this can be processed in order to become electronic and/or produce information relevant to the material itself ('barcode catalogue') or to produce ad-hoc documentation ('mandatory documents'), as, for instance, those provided to OGMR. Alternatively, field data can use existing systems to produce a similar outcome.

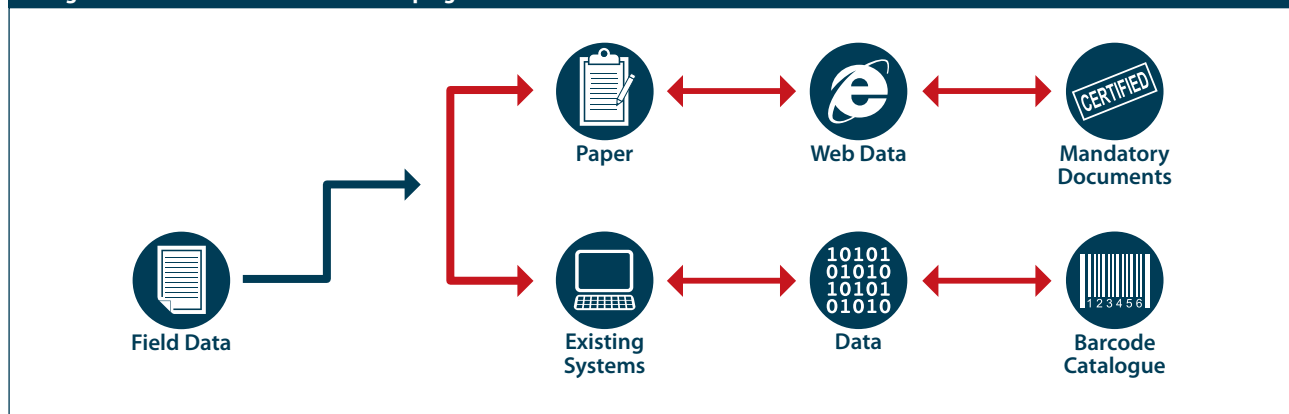
Another type of certification system is the Analytical Fingerprinting approach that was developed by BGR, detailed in Box 4.

Box 4: Analytical Fingerprinting for coltan, tin and tungsten ores⁴

The Analytical Fingerprinting (AFP) initiative was launched by BGR in 2009 and can be used either in conjunction with CTC or independently. Its aim is to identify the origin of a concentrate by comparing its mineralogical and geochemical characteristics to samples of known provenance that are stored in a BGR reference database. A streamlined AFP methodology has been established to allow for efficient and cost-sensitive analysis. On average, a (yet to be established) certification lab running at full capacity could analyse about 1000 concentrate samples per year. There are, however, several constraints to the implementation of the AFP.

First, the initiative involves a detailed and comprehensive sampling of active mining sites of the producer, with data needed to be updated regularly. Second, should a company desire certification of the whole trading chain, all stakeholders need to be informed to facilitate access to mineral concentrates at each handling step. Third, sampling of production sites for constructing the AFP reference database needs to be carried out by authorised and trained personnel. Capacity might therefore be a constraint. Fourth, verification of the exact location of the production site (by GPS and on geological and topographic maps) is essential to ensure result reproducibility and long-term monitoring of AFP characteristic features. Additionally, individual samples should be sealed, labelled with a unique identifier, and be accompanied by precise documentation with respect to sample location. Overall, fingerprinting the ores can provide extra information in case of dispute of source of material and can be an optional checking instrument for traceability beyond a standard documentary system.

Figure 2: Commonalities in Record-keeping



Source: Helveta (2010)

⁴ BGR, AFP Update, July 2010

Overview of Main Trends and Issues

The objective of this section is to understand the record keeping systems currently in place in the four CTC Pilot companies to record mineral production and transport. RCS consultants spent a number of weeks in the field visiting the mine sites, aggregation sites, terminals, head offices, laboratories and trading partners in order to understand in detail the supply chain of minerals produced in Rwanda.

Despite some slight variations from one company to another, common characteristics define operations and processes carried by the four pilot mining companies studied in this project. As a result, both the supply chain and the record keeping systems devised by each company are relatively similar, with variation largely a result of the extent to which the operation had invested in its operations overall.

The following sections are divided between general characteristics and record-keeping characteristics observed during the research. These are summarised in Table 1 below.

General Characteristics

On most mines there are both artisanal mining activities and semi-industrial mining activities, meaning that the digging and processing of minerals are not made manually only but also with the use of machines. Artisanal miners are registered and organised in groups that are headed by a team leader, also called sub-contractor. The team leader is employed directly by the company and artisanal miners are paid by him according to the minerals they produce. There are between 15 and 60 team leaders per mine site and themselves typically employ between 20 to 120 miners to work on the site. The teams also carry out rudimentary washing of the material to produce 'pre-concentrate'. Production from the mines, once paid for, is processed by the company itself either at the mine premises or at Kigali, at the company's terminal. Companies hold exploration or exploitation licenses or both.

All the companies face issues of theft at various scales. Theft is largely due to local négociants/traders who buy production from artisanal miners at a higher price than the company is able to pay (due to the fact that négociants do not have to deduct operating

Table 1: Summary of general characteristics of the value chain and general record-keeping characteristics

General Characteristics	Record-keeping characteristics
Artisanal and mining activities as well as semi-industrial mining.	All the companies declare their production monthly either to OGMR or the Ministry of Mines. They also submit a report every six months summarising the company's mining operations.
Once paid for, production from mines is processed by the company.	All the companies, but one, use computerised record keeping systems, meaning that the production data is entered on a daily basis on to Excel sheets, either at the mine premises or at the company's terminal in Kigali. One company has recently invested in a new computerised management system.
Artisanal miners are registered and headed by a team-leader or sub-contractor, who in turn is employed by the company. There are around 15 to 60 team-leaders per mine site employing around 20-120 miners.	Generally, record keeping among the pilot companies was good, but insufficient for the purposes of the traceability requirements of the CTC scheme.
All companies face issues of theft due to local négociants/traders who buy production from artisanal miners at a higher price than the company is able to pay.	
'Traders' are an important part of the supply chain, and either buy the production outright from the company or act as a 'logistics company', organising the independent analysis and necessary documents and the export itself.	

costs). One of the mining companies' general manager who was interviewed suggested that these local négociants bought production at up to 25% higher than the company was able to pay. To address this issue, OGMR has been working on a law that would prohibit these négociants from practicing. At the time of writing, the law was in discussion at the Parliament and was hoped to be published in September 2010.

Traders are an important part of the supply chain and act as an intermediary stage before the export of production either to a parent company or an international buyer. Traders either buy the production outright from the company or act as a 'logistics company', organising the independent analysis and necessary documents and the export itself. Prior to export, an independent analysis is sometimes carried out by the Kigali-based company Alex Stewart (AS) who also acts as an independent agent responsible for sealing the bags, loading bags into a container and securing the containers for export. While this is not necessarily standard practice, it can occur if requested by buyers.

General Record Keeping Characteristics

All the companies declare their production monthly either to OGMR or the Ministry of Mines. They also submit a report every six months summarising the company's mining operations. OGMR is in the process of issuing a template that companies will need to fill in every month (See Annex 2). This template summarises information that concerns the identification of the mining operator, the quantity of mineral exploited, the monthly production, the number of the employees, the tools used in

mining, the sales, the accidents, the impact on the environment, and any other observations.

All the companies, but one, use computerised record keeping systems, meaning that the production data is entered on a daily basis on to Excel sheets, either at the mine premises or at the company's terminal in Kigali. One company has recently invested significant resources into a new computerised management system called Sage Accpac that fulfils different functions, including accounting, customer relationship management and business management.

Generally, record keeping among the pilot companies was good, but insufficient for the purposes of the traceability requirements of the CTC scheme. This is to be expected, as current record keeping procedures were primarily designed to fulfil other purposes such as ensuring the correct record of volumes, payments and mineral percentages following aggregation, and to prevent theft, rather than maintain the integrity of the supply chain.

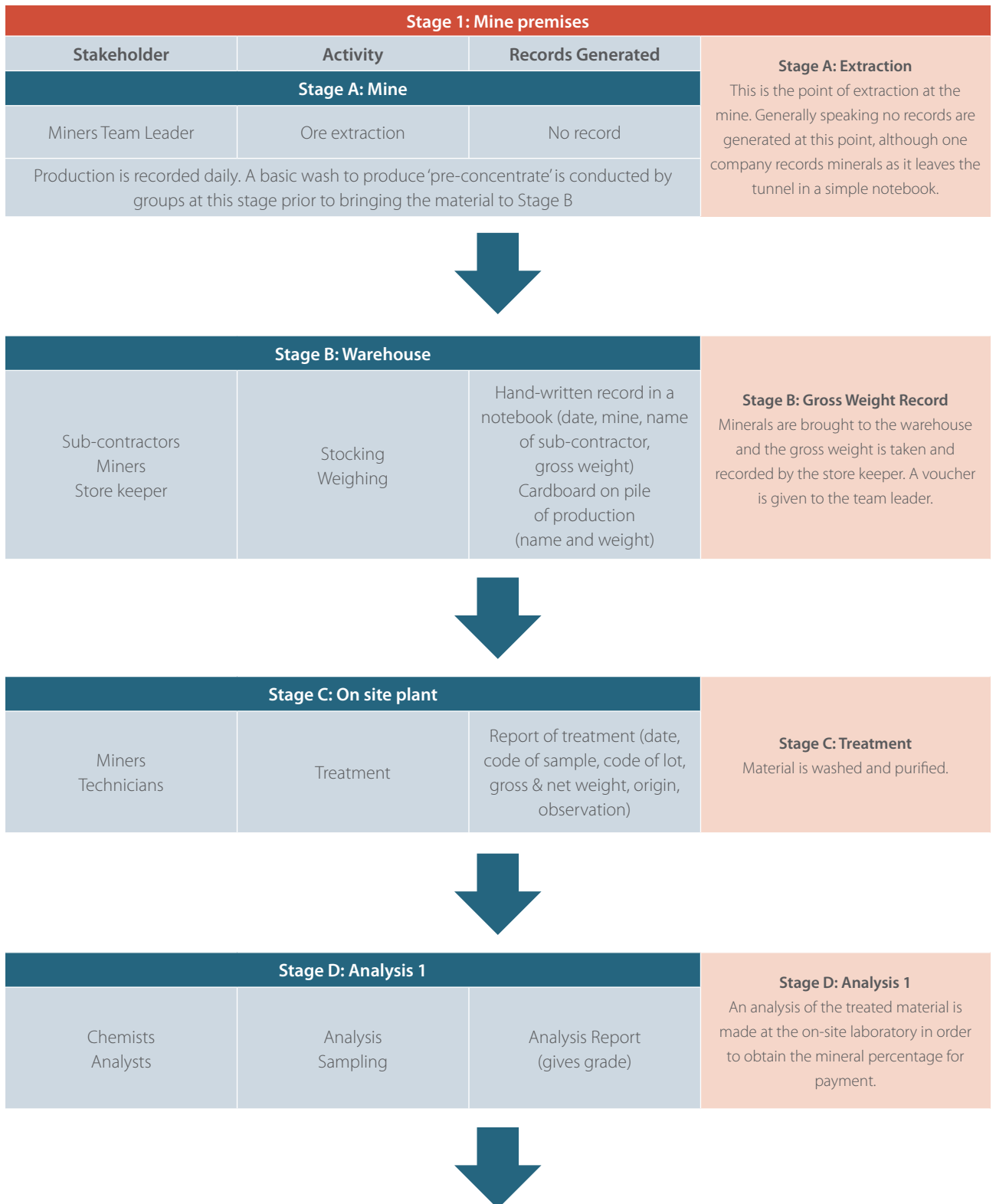
Figure 4 below illustrates the general mineral trading chain identified for all pilot companies. It is divided into three stages, i.e. Mine premises, Transport and Trader, Trader's aggregation and Export, and includes a description, from left to right, of the stakeholders, activities and records kept at each stage of the trading chain. As slight variations exist from one company to another, individual trading chains are illustrated in Annex 1.

Figure 3: Artisanal miner at NRD mine premises



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Figure 4: Description and Illustration of the general mineral trading chain



Stage E: Payment			Stage E: Payment Payment to team leaders and miners is made according to the Stage D analysis and the net-weight after treatment.
Sub-contractors Employer	Payment	Report of payment per sub-contractor (kept at the mine premises and at the company's terminal)	



Stage F: Aggregation 1			Stage F: Aggregation 1 Mine companies aggregate the material provided by each group of miners on site in order to transport.
Mine premises employees	Mixing of material Material put into bags	Bags are marked with sticker (type of material, quality and weight but not the name of sub-contractors who contributed)	

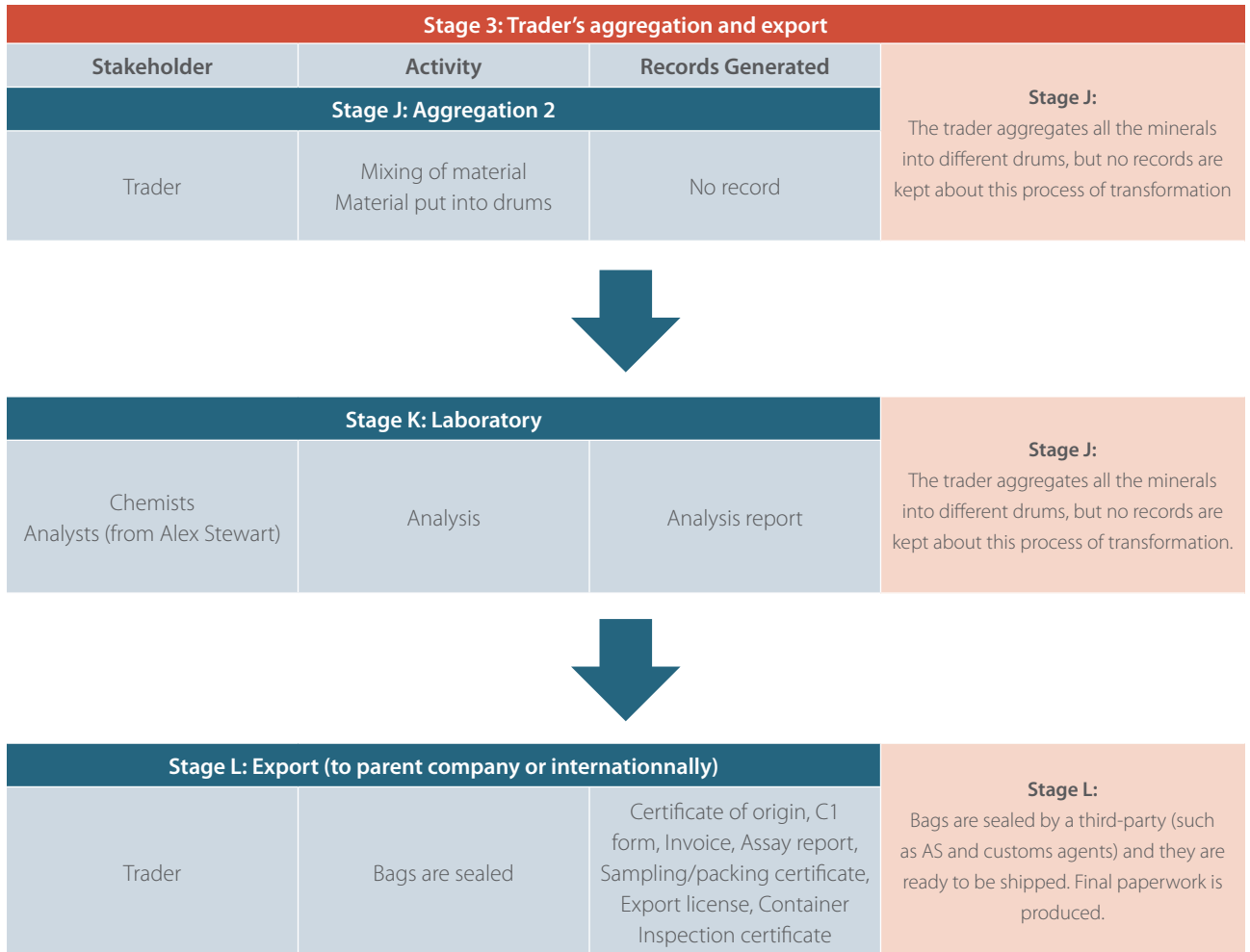
Stage 2: Transport and Trader			
Stakeholder	Activity	Records Generated	Stage G: Transport The material is transported to the company terminal or to the trader.
Stage G: Transport			
Driver Security agent	Production sent to company's terminal or to trader directly	2 carbon copies of delivery note sent with driver (1 copy kept at the mine premises)	



Stage H: Buyer/Trader			Stage H: The material arrives at the trader who will carry out laboratory analyses (Stage I) to determine selling price. A delivery note and invoice are produced.
Domestic trader	Buying of production	Delivery note Invoice	



Stage I: Laboratory			Stage I: Laboratory analyses are carried out on-site or by Alex Stewart to certify the nature of minerals and agree on a sell price. An analysis report is generated.
Chemists Analysts (from the trader premises or Alex Stewart)	Analysis	Analysis report	



Note:

Before export, 'customs agents' ('agences en douanes'), which are private companies employed by major exporters and traders, deal with all paper-work. The process is simple and consists of an online form with information relative to the merchandise which is received and treated by the Rwanda Revenue Authority (RRA). Provided all the documentation is supplied (pro-forma invoices, certificate of origin, information relative to the nature of the merchandise) according to specifications, the RRA then authorises the shipment. Any company that needs to export products from Rwanda will turn to these 'agences en douane', unless they are registered as such themselves (Phoenix Metal, for instance, does not hold such a status and relies on said intermediary)⁵.

Figure 4 is a general illustration of the value chain and some variations exist between one mine/company and another. For instance:

- The material is sometimes weighed and roughly processed at the mine itself, as opposed to being treated at the mining company's terminal
- An informal analysis is sometimes made as soon as the production arrives to the warehouse, followed by a second, more technical analysis after treatment
- Sub-contractors are sometimes paid with an advance according to gross production and then their salary is adjusted according to net production
- The information collected regarding the production,

storage, transport and sale, is entered on to a computer (on an excel sheet) on a regular basis (but with variation between companies).

For a comprehensive analysis of each individual mineral trading chain per pilot company, please refer to Annex 1.

⁵ Interview with a member of the Rwanda Revenue Authority, Kigali, 21 July 2010

Key Issues within Current Record Keeping Systems

In the course of conducting the research and interviewing key stakeholders, RCS identified a number of key issues which were common to all CTC Pilot Companies and which must be addressed in the record keeping system.

- Continuity of information along the supply chain
- Information Management (centralisation, storage, oversight, computerisation)
- Traceability of material (where aggregation of material occurs)
- Reporting (Who has oversight).

Continuity

Continuity of data is important in order to ensure traceability from point of extraction to point of export. Currently, data does not necessarily travel with the material from the point of extraction to the point of export but rather stays in situ, at point of extraction or processing. The lack of continuity of data means that end users receiving material at the far end of the supply chain have little to no visibility of actors involved at the beginning of the supply chain, necessary for confidence in the origin of the material.

Recommendation:

- **Data should travel with the material so that information on source and movements can be disclosed at any point in the supply chain.**

Information Management

The centralisation, storage and oversight of the information were also identified as an issue for the pilot companies. Where data is produced, it is often not gathered in a central location for storage and collection, implying a lack of visibility and oversight. To address this issue, there should be a better information management system, which ensures the storage of paper records for at least five years.

Where data is recorded in electronic format it is not collected or processed in a manner which enables production of information. In other words, even if data is collected adequately, it is not transformed into useful information.

Recommendations:

- **Data should be stored in a central location for at least five years and information management systems should be put in place.**

- **Electronic Information Systems should be identified to enable the production of useful information such as origin.**

Traceability of Material (Aggregation)

Between extraction and export a single lot of material can undergo several instances where it is aggregated and refined with material from other locations. This can pose a problem for traceability as the new lot typically does not retain the information from the previous lot. There are currently two major points of aggregation in the supply chain, firstly at the mine premises and secondly at the mine terminal or trader's level, to prepare a lot for export. Trader lots can contain material from up to 200 deliveries. Even though the trader himself is able to identify the different sources, the importer at the end of the value chain is not able to distinguish physically, or even through records, which part of the production comes from where as the production has been mixed. Aggregation which loses information on the source also nullifies the purpose of the CTC programme and should be avoided by CTC companies.

Recommendation:

- **Assurance in the supply chain requires that aggregated material to retain the information on the 'new' material's source.**

Reporting

Finally, the CTC must build into reporting systems for the government body that will regulate and provide oversight. Records need to be submitted regularly and uniformly and the regulatory body must have an information management system.

Part III: CTC Standards for Record Keeping

The record keeping system is at the heart of the CTC project and it is a key part of ensuring that the goals of the scheme are met and assured and the scheme achieves credibility from outside observers. In the context of record keeping, the key goals for the CTC project are to assure the supply chain by:

- Verifying the source of minerals and ensuring that the integrity of the supply chain is intact from point of extraction to point of export
- Providing visibility and oversight over the entire supply chain to enable management and independent observers to verify the chain of custody
- Disclosing information on stakeholders and supply chains where and when necessary.

The information detailed in the section above provided the starting point for the development of the standards for record keeping within the CTC project. The record keeping systems of the pilot companies reviewed in this study vary from those who operated very basic, paper-generating systems to those who had developed sophisticated electronic records after significant investment. Nevertheless, as the general chain of custody detailed in figure 3 above was very similar across the pilot companies there is an ideal opportunity to provide general standards of record keeping that can then be populated slightly differently by each company according to their individual requirements.

The previous section identified the current deficiencies in record-keeping practices among the pilot companies, namely:

- Continuity of information along the supply chain
- Information Management (centralisation, storage, oversight, computerisation)
- Traceability of material (where aggregation of material occurs).
- Reporting (Who has oversight).

Based on the varying levels of capacity between companies, RCS has identified the following requirements for a CTC standard for record keeping.

1. The Standard should be able to be applied using both paper and electronic recording of documents to account for varying capacity among companies. The different requirements/ characteristics and degrees of sophistication of the companies (e.g. computer literacy; access to the electric grid; internal management systems/software, etc) warrants variation in the system in order to meet and mitigate the key deficiencies identified.
2. However, as there will be significant records generated, records must become electronic as early as possible in the

supply chain to ensure that the production of data remains manageable. Electronic conversion should take precedence at least at company headquarters where there is likely to be better human-resources, financial and technical capacity. Thus, individual paper records (or tags) will, as soon as possible, become certificates with full information of the supply chain recorded. More particularly, a paper trail for this passport would be generated only to the point at which data could be entered electronically and an on-line audit trail can be assured. Paper documentation should ideally be kept for a five-year-duration, and the nature of this documentation may vary according to circumstances, since different companies have varying facilities. For example, should a mining company have the capacity to keep an electronic record of mining outputs at the tunnel exit and/or plant (e.g. through Excel), then there is little place and rationale for a paper trail. However, should this not be the case, then a paper trail is warranted. In most cases, since mining companies' plants are located in Kigali as well as the Trader's, there would likely be a need for a paper trail starting at the sub-contractor and/or tunnel level (see below for more information). This trail would also ideally be supported by two carbon copies, one to be kept by the sub-contractor, and one by the mining company.

3. **The Standard should be cost effective and able to be implemented by less capitalised companies.**
4. Where possible, **the Standard should rely upon data that is already generated by the companies, rather than creating another layer of bureaucracy.** It should also be noted that the system suggested below contains information/data already used by and required from companies and complemented only with additional information that is deemed necessary for the purposes of the CTC.
5. **The Standard should enable efficient oversight by regulatory authorities, independent auditors and investors/ buyers** (see section on Oversight). For instance, should OGMR fulfil this function, it should obtain enough data and information that allows it to have effective oversight over the system where required as well as build its knowledge base of the sector.
6. Because the purpose of the CTC scheme is to guarantee transparency and traceability of the material, **the Standard should ensure that (sufficient and not necessarily all) information is available to all stakeholders in the supply chain and that source data travels with the minerals.** The Standard should ensure continuity of data in such a way that information relative to the mineral travels along with the mineral itself, either physically and/or electronically.

The CTC 'Passport' Standard

A passport is a document that travels with the owner and which must be presented when the owner wishes to cross a border into a new territory.

A CTC passport Standard would begin its life at the point of extraction at the mine site and/or tunnel. Its purpose would be to compile data on production and processing activities at each step of the value-chain and retain the information when a 'border' was crossed – in the context of the CTC system, a border is when the material passes hands from one entity to another, e.g. A sub-contractor to the mine company, or mine company to a trader.

Each stage of the production (outlined in section II above) constitutes a 'page' of the passport, with information from one page used to create the second, etc. In other words, data is progressively aggregated from the information gained at the previous stage or level: the sub-contractor provides information relative to its extractive activities to the mining company; the company compiles this information and provides relevant information to the trader relative to its outputs, etc.

Pages are generated where material is aggregated and a different page is produced for:

1. Production
2. First Aggregation
3. Second Aggregation
4. Export (has complete passport with the information from 1,2,3,4)

Figure 5 below shows the logical step of aggregation from one level to the next with the creation of pages in the passport.

The CTC Passport in practice

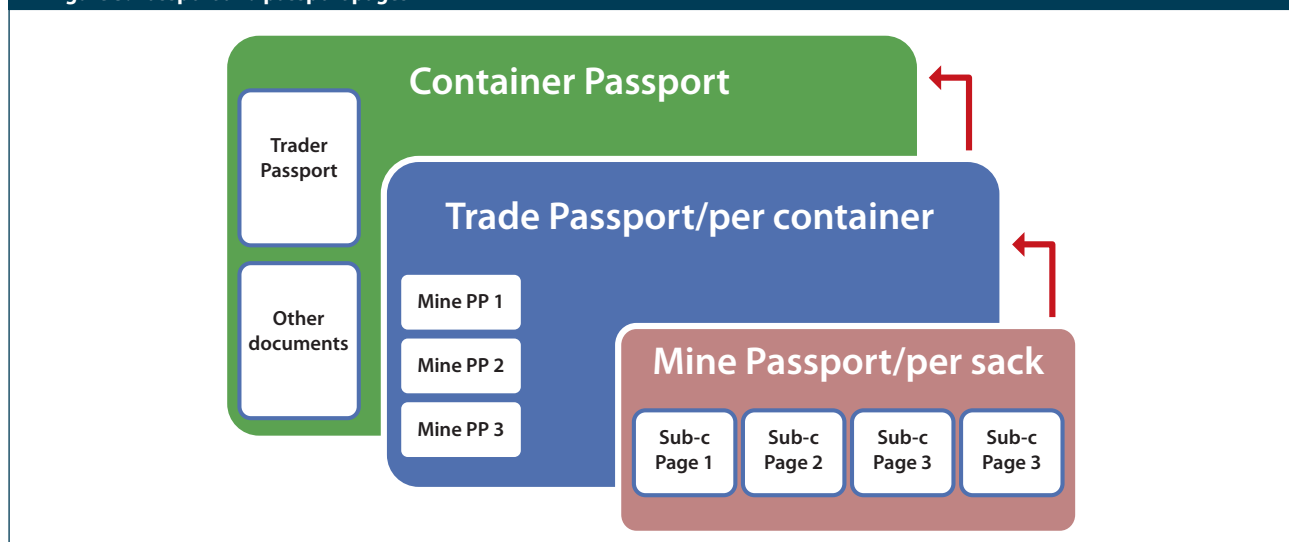
While the passport has been designed to use already existing information generated by CTC pilot companies, the descriptions below are only for a generic system and, in the absence of a guiding regulatory body, will have to be altered according to the needs of each company. Company management should decide on the system best suited to their needs. The passport is divided into four pages related to the four main stages of the supply chain. Each form should be signed by the relevant actor in the trading chain, to verify accuracy.

Stage 1: Production Page

When a team leader/sub-contractor has produced a given volume and sells/delivers it to the mining company, a 'page' would be created containing information regarding the name of the team-leader/sub-contractor; name of mine of origin; gross and net weights; and the on-site analysis. This is only virtual since no passport per se would be generated at this point. To the sub-contractor or leader, this step would be the equivalent of filling in a carbon-copied form based on information which is already gathered.

Importantly, it should also be noted that this page might need to be filled in on behalf of miners/sub-contractors purely because they are sometimes illiterate. Discussions during the workshops also shed light on the practicality of filling in this information to start with rather than retrospectively, once independent analyses have been conducted (see Part 4 Company Assistance).

Figure 5: Passport and passport pages



Source: RCS (2010)

In practice, this page should take the form of a piece of paper produced in duplicate or triplicate, depending on the point of computerisation of the passport, with one section remaining with the sub-Contractor, another at the mine site, and another travelling with the material to the mine terminal.

In addition, the feasibility of producing this information might vary according to the characteristics for each company relative to outputs. In other words, where a company relies on a large number of sub-contractors, it would be difficult to fill in details about them on a continuous basis. For this reason, it might be required to rebrand the first passport page that will be created so as to focus only on production per mine and/or tunnel within a company's concession. Said differently, whenever a company reaches what could be qualified as industrial production, it would be sound to record information relative to tunnels, rather than teams or team-leaders. Either way, this does not contravene the CTC spirit and/or objective, since the intention is to specify the point of origin, which would be achieved regardless of the focus on sub-contractors or tunnels/mines.

Figure 6 below provides a generic illustration of what the passport page would contain. In practice, and as explained above, the layout may be different according to the needs of the company.

Stage 2: First Aggregation

Typically, after the production has been bought and paid for, the mining company will conduct an aggregation of the

material prior to transport (either to the mine terminal or to a trader). At this point the mining company must gather all the Sub-Contractor pages and assign them to the aggregated material. **Put simply – both material and documentation is aggregated at the same time.**

After aggregation of the material, the company produces a new form, which includes the essential information from form A to allow for traceability, as well as new information created by the newly aggregated material. Such information could refer to the company's own laboratory analysis; total gross and net weights for each sacks/drums; transport references, etc. Figure 7 below provides a generic illustration of what the passport page would contain.

Colours in Figure 7 highlight that a process of aggregation has taken place, with the orange box representing data from the previous stage ('production page') in aggregated fashion (i.e. containing team-leader number, net weight and analysis only) and the blue one relating to the new information created as a result of aggregation.

Form B must have a unique number and must be attached to an individual sack/drum in order to ensure the traceability of each sack. **Should a large aggregation take place for instance in the case 30 Form A lots are mixed together, the data within Form B can be the same across a number of forms, so long as each sack is given a unique number reference.**

Figure 6: Page 1 of the Passport: Production Page

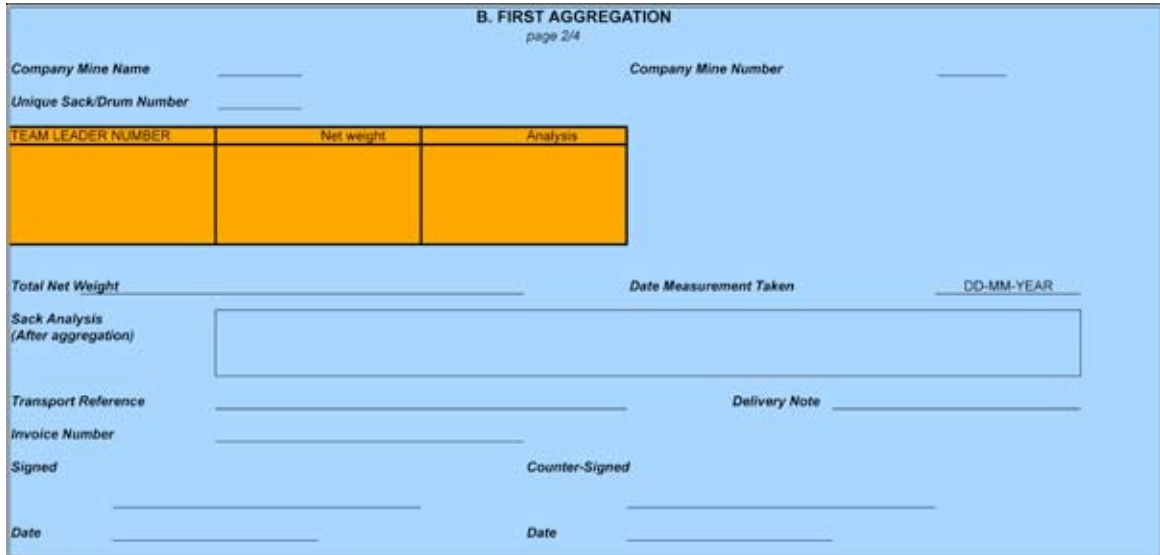
The form is titled "A. PRODUCTION PAGE" and is labeled "page 1/4". It contains the following fields:

- Unique Serial Number: (auto generated, e.g TEAM_MINE_TUNNEL_NUMBER)
- Name of Team Leader: _____
- Number of miners: _____
- Name of Mine of Origin: _____
- Tunnel: _____
- Gross Weight: _____
- Date Measurement Taken: _____
- Net Weight (after treatment): _____
- Date Measurement Taken: _____
- Analysis (Net Weight): [Large empty box]
- Signed: _____
- Counter-Signed: _____
- Date: _____
- Date: _____

Source: RCS (2010)

Electronic Data Entry: the sooner a company can begin to enter information into a database and produce 'certificates' containing all of the information above, the better. Ideally, electronic data conversion will begin between Stage 1 and 2, with the records produced by sub-contractors duplicated electronically and paper records stored at the mine site for auditing purposes only.

Figure 7: Page 2 of the Passport: 'First Aggregation'



B. FIRST AGGREGATION
page 2/4

Company Mine Name _____ Company Mine Number _____

Unique Sack/Drum Number _____

TEAM LEADER NUMBER	Net weight	Analysis

Total Net Weight _____ Date Measurement Taken _____ DD-MM-YEAR _____

Sack Analysis (After aggregation) _____

Transport Reference _____ Delivery Note _____

Invoice Number _____

Signed _____ Counter-Signed _____

Date _____ Date _____

Source: RCS (2010)

Transport: Transport of the material typically occurs at this stage, either to the mine terminal or directly to the trader. Transported material should ideally be sealed and each sack or drum should have a unique reference number containing a reference to the information generated at production and aggregation.

Stage 3: Second Aggregation

A second aggregation process typically occurs at the mine terminal or once the material has been sold to the trader. Companies can perform a number of processes of aggregation in order to achieve a product with a particular percentage of purity. Regardless of the number of times the material undergoes aggregation, the information from Stage A and B must be included in the outcome.

After buying the mineral from the mining company, the trader would process it, analyse it, weigh it etc. With this, new data would be generated, calling for an additional page in the passport. Therefore, after including summary data for the process involving the mining company (i.e. name of the company/mine; sack-drum number; date of receipt; transport reference; analysis content) (blue box in Figure 8 below), the trader would also add information relative to its own process. Here, different fields for the laboratory analysis are included with the intention of comparing them (e.g. is the mining company's own analysis different to that from the independent assayer and/or the trader's?)

Stage 4: Export

After aggregation, the 'Export' page would be created. In practical terms, this means that the company/trader would include all the documentation they have gathered thus far and send it

alongside the lot. Other document should also be submitted at this point to overseeing bodies/authorities such as OGMR, customs office etc. For this reason, existing forms such as ITRI's C1 and/or certificate of origin etc would be added as well (see Figure 9 below).

In brief, the Export Page is simply a summary of all documents required for export, along with a certificate produced by the information generated in Form C.

Unique Numbering

As can be seen in the first page of the proposed passport system, a unique identification numbering should be created to better and quickly identify origin of the production so that mineral production can be traced back to the production site. Ideally, as numbering will also be crucial for the auditing of the system, the numbering should be determined and governed by the body responsible for oversight of the system. In the absence of an oversight body, the numbering should be unique to each company, mine and subcontractor. Technical advice will also likely determine the ultimate format and use of this numbering. It will also be necessary to think at a later stage if and how this numbering intervenes for paper-work, whereas for electronic systems, it is likely that software solutions will help generate this numbering automatically.

Figure 8: Page 3 of the Passport: 'Second Aggregation'

C. SECOND AGGREGATION
page 3/4

TRADER NAME REFERENCE _____ (e.g. TRADERNAME_NUMBER)

MATERIAL

No	Name of Mine/Company	Sack/Drum No.	Date of Receipt	Transport Reference	Analysis/Content
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					

TRADER NAME LOT NUMBER _____

NET WEIGHT _____ CERTIFICATE OF ORIGIN NUMBER _____

SEAL NUMBER/ID _____ COPY OF INVOICE _____

Analysis From Trader

Independent Analysis

Signed _____ Counter-Signed _____

Date _____ Date _____

Source: RCS (2010)

Electronic Data Entry: Electronic processing of data is imperative at this stage, particularly if the material undergoes several processes of aggregation. Without the electronic production and storage of information, the data generated will quickly become unmanageable.

Figure 9: Page 4 of the Passport: 'Export'

D. EXPORT
page 4/4

FORM C REFERENCE No. _____

Container Inspection Certificate _____

Certificate of Origin _____

Other references _____

Signed _____ Counter-Signed _____

Date _____ Date _____

Source: RCS (2010)

At this stage, we recommend a numbering format of the following sort:

NAME OF THE COMPANY_TUNNEL OR MINE OR SUBCONTRACTOR
ID_DATE

This numbering is likely to vary according to company. One example would be:

NRD_NEMBA_GERMANY_SUBC001_01012010

Electronic Systems

Having presented the passport as a solution to ensure traceability for the CTC scheme it is similarly important that this solution is complemented by a computer-based platform which emulates the functions fulfilled by the passport (i.e. transparency, traceability, visibility) and that replicates most of the data that is input. As indicated, there should be a point of transfer between the paper-based and computer-based solution, though this might differ for companies according to their particular circumstances (access to infrastructure, computer literacy, costs etc), we recommend that this transfer occurs as soon as possible. The consultants reviewed a number of hardware and software solutions which are designed to guarantee some measure of oversight and transparency mechanisms. The most relevant were presented to the companies.

Solution 1: Complete hardware and software system

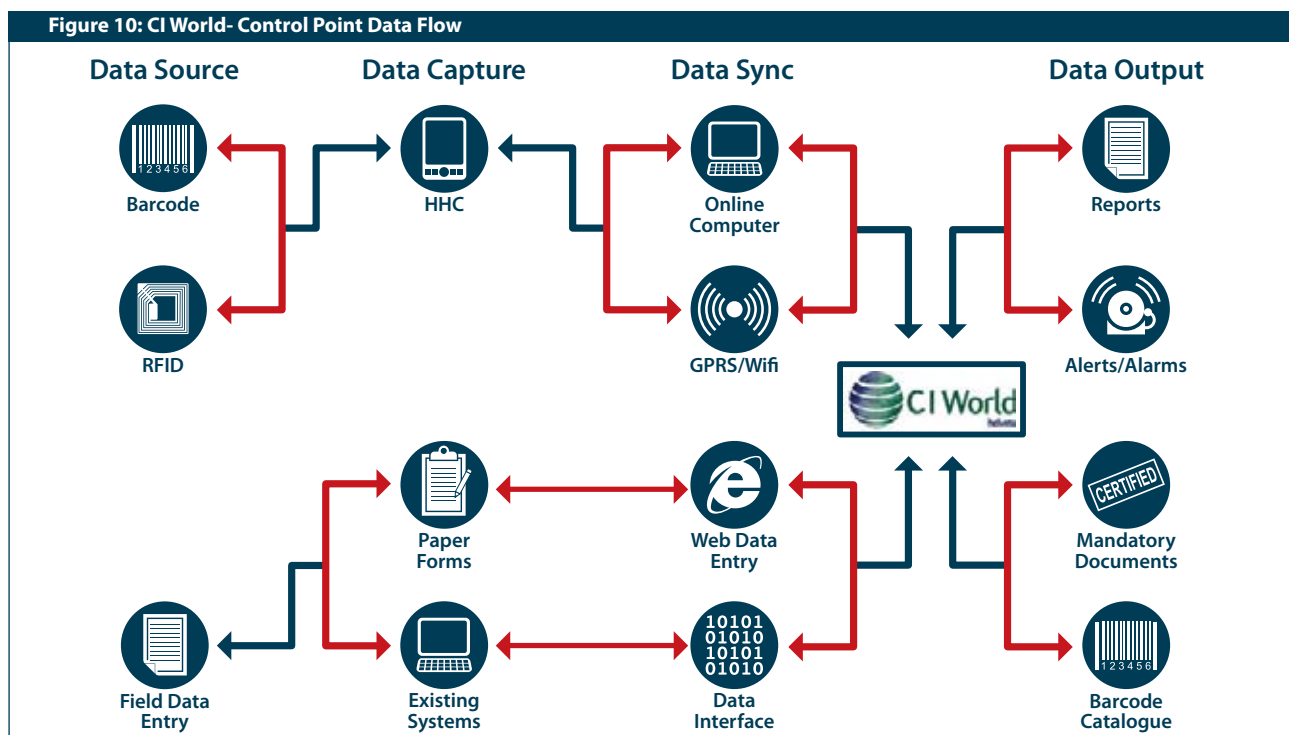
Figure 10 below illustrates the flow of data throughout each control-point (i.e. each stage of the value chain), for one of the data management systems. By relying on Barcodes and/or Radio-Frequency Identification, a specific handset captures (reads) and transmits this information which is then synchronised, either online or through GPRS/Wi-Fi services so as to produce key information about the supply chain, consisting of reports, alerts, mandatory documents, barcode catalogues etc (outputs). An alternative scenario would consist of field data being input on

paper forms which is transmitted/synchronized on a web-based solution or field data relying on existing systems to produce similar outputs as the above.

This kind of software can also automatically generate alerts if/when there is a problem in the supply chain. For example, having tagged a sack of cassiterite at the first control point, the same sack ID that is tagged again later on in the chain can trigger an alert, usually indicating that some information has changed, e.g. the weight of the sack at that point does not tally with the initial one; the chosen route for the sack is not the desired one etc. Following the alerts, the information/data can be corrected electronically and/or action taken.

This kind of software provides online tracking, monitoring and validation of the supply chain, which would be visualized in a secure online environment, password-accessible from anywhere with internet connectivity. Any sack, drum or container containing CTC minerals would be tagged for identification purposes using some of the technology already alluded to below.

The advantage of this solution is that volumes could easily be reconciled from point of extraction to point of exit/receipt since any inspected shipments that move through the supply chain is tracked. Should information from one supply chain control point to the next be non-conformant, alerts would be generated. In the same way, reports could easily be generated providing



Source: Helveta (2010)

overall data and statistic either about a specific container/cargo, about the mineral sector in Rwanda and about the supply chain itself in such a way that the mineral chain could be improved (i.e. what productivity losses can be identified; how can they be remedied etc). Finally, this kind of software would also provide the possibility of dealing with tax and duty obligations/exemptions for company involved in the value chain as well as provide buyers/clients with provenance and processing information about the minerals.

The disadvantage of this kind of solution is that while it is comprehensive, it also requires significant investment and is likely only undertaken when the resource is good enough to justify the expenditure.

Solution 2: Electronic Data Management using software

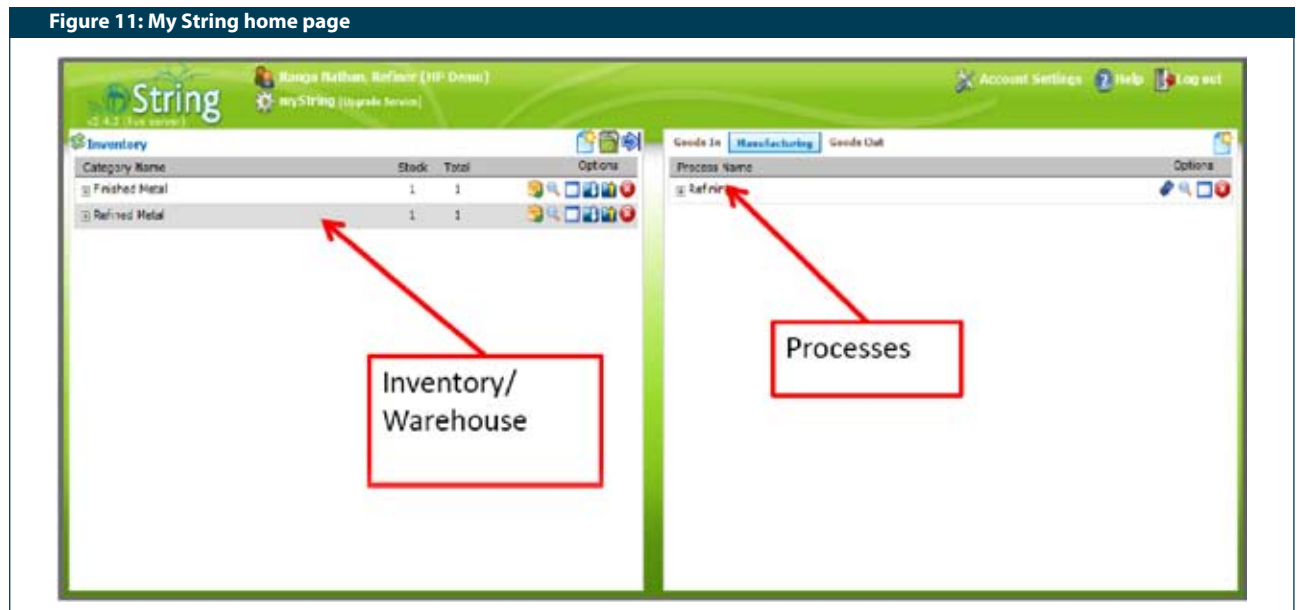
The consultants reviewed and presented an internet-based traceability software which provides online traceability services for the whole supply chain (provided all actors/control points in it have an active account). The software creates a virtual data chain alongside the physical product chain and receives and sends traceability data to customers in a secure way (data is encrypted) and manage information about the processes and products of the supply chain.

Most commonly, the clients of this software intend to provide visibility in the value chain from the bottom-down (i.e. from the finished product down to the raw material), but the system can be exploited to produce the reverse effect (i.e. trace the material from source of extraction to point of sell). To do this, the software relies on two components: the first option would consist in raw

data being input into a tailor-made excel spreadsheet (with field entries speaking to the CTC scheme; i.e. for mineral companies, information regarding net-gross weights, analysis etc. and for traders, information regarding the refinement process). The spreadsheet could be uploaded periodically (daily or weekly, for example) to a server, or even be sent to a generic e-mail address, which then distributes data for each field into the servers' databases. The second option would work in a very similar way, with the background technology being SMS text messaging instead of computer based uploads. This technology is currently under development, but it would provide mining companies/traders etc to provide short key information about loads, contents, payments or any similar information (e.g. information relative to volumes would be sent to one specific phone number and coded in a way different than analysis contents, financial information etc).

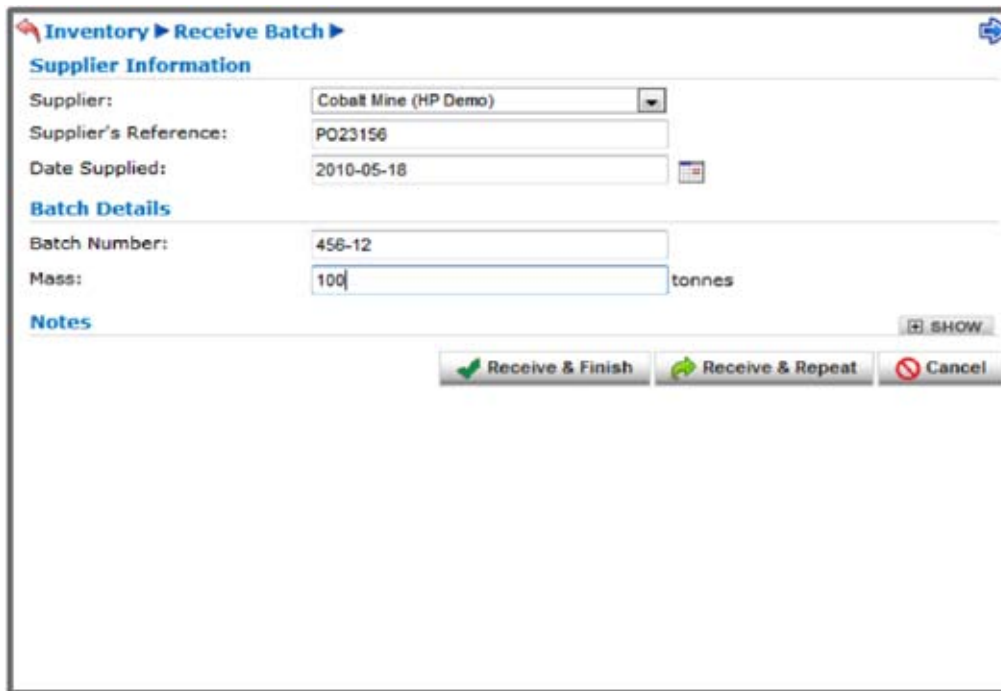
In summary, the software is run from a central database/platform, containing and accumulating information relative to the mineral (i.e. an inventory) as well as that relative to the process of fabrication/transformation. Figures 11-15 below provide a snapshot illustration of what this might look like. These figures are generic and the fields would need to change so as to suit the CTC, but the concept would remain the same. It should also be noted that these pictures demonstrate the 'standard' way of uploading information relative to the trading chain, not how the software could work if using excel spreadsheets and/or SMS technology. In other words, the pictures illustrate how the accumulation of data would be achieved by populating the fields manually (i.e. if a person does it). SMS and Excel technology are intended to populate said fields automatically.

Figure 11: My String home page



Source: My String

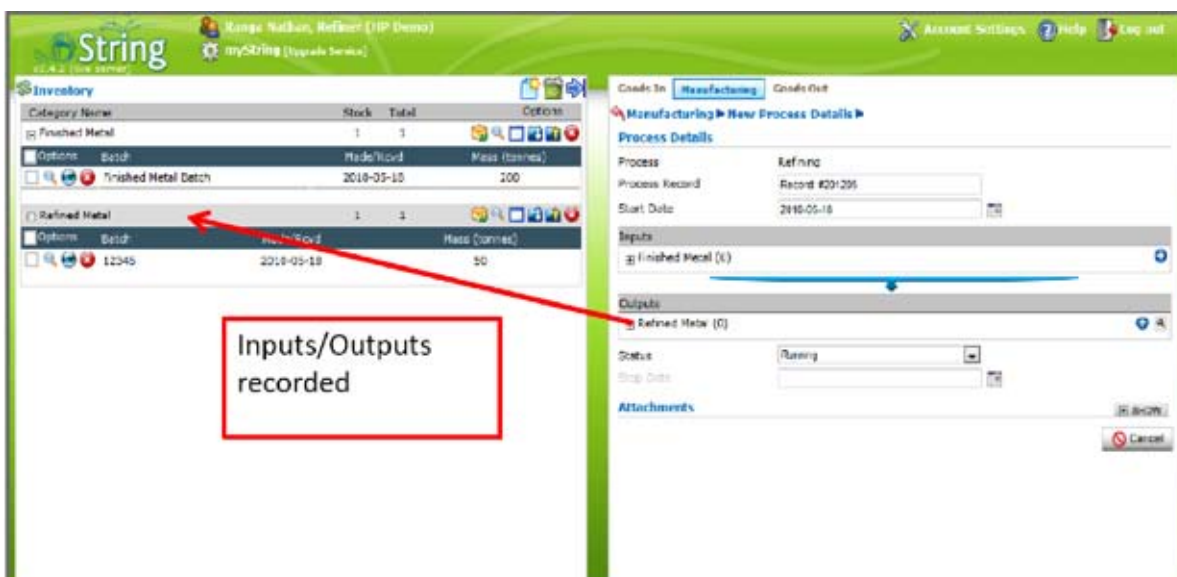
Figure 12: Recording Material at Mine sites



Source: My String

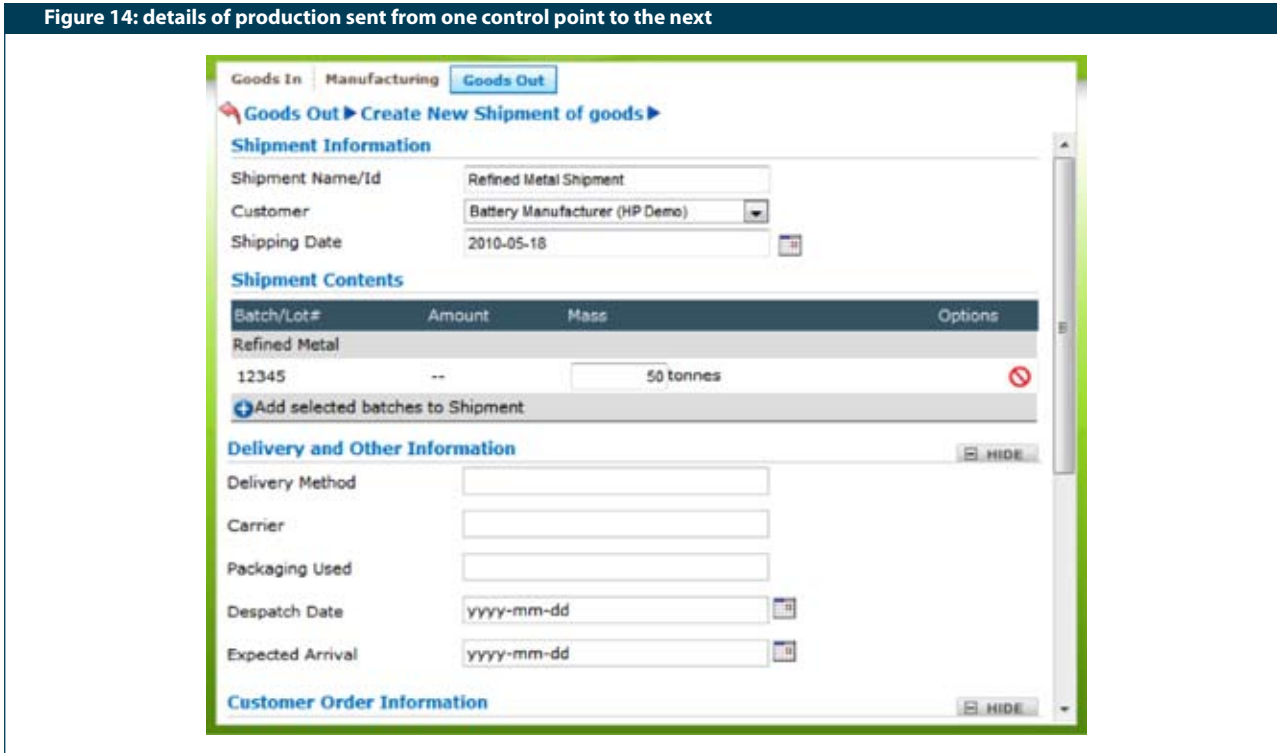
Key: information about a batch is computed and saved on the software. The same information can then be shared and/or automatically sent on to the next control point (i.e. the trader), who would see this information and add on to it (see below)

Figure 13: recording the refinement process (batches in and out)



Source: My String

Figure 14: details of production sent from one control point to the next



Source: My String

Key: Mining companies and/or Traders would pass on information relative to their refinement process

Figure 15: Traceability of Jewellery using My String



Source: My String

Note: information on the left-hand column relates to the different steps and/or processes required to produce the final product. The map on the right-hand side provides visual information of the geographical coverage involved in the production process.

As this type of software simply replicates an existing paper trail it requires far less investment. Disclosure of information from stakeholders involved in the value-chain to any client/buyer and/or external actor to the value chain would depend strictly on the will of the company/companies. In other words, the software allows to

filter information and to disclose as much as is required. Ultimately, as shown in figure 15 above, the type and layout of information disclosed is meant to provide safeguards for transparency. Box 5 discusses the type of involvement OGMR should have vis-a-vis the use of software solutions.

Box 5: OGMR and software solutions

Whichever software is ultimately chosen to support the computerisation of the passport, it will be important to think of what role and level of 'authorisation' (or input) OGMR should have. Interviews and workshops held have shown support for the idea that OGMR should regulate the CTC. How this is done and the rationale behind this decision will be discussed later on (see Oversight and Reporting).

However, it is important to note at this point that, with regards to the software, OGMR will need to be considered as an important control point which certifies the merchandise and authorises export (along with other Governmental bodies) and one that receives and generates overall information relative to the CTC. That is, OGMR's current mandate is to issue reporting guidance and requirements, and mining companies already report-back on a frequent basis. Should the choice lean towards CI World, OGMR should ideally have the ability to compute overall trend data relative to the industry/sector and produce reports contributing to its data-base. Should the choice be My String instead, OGMR will need to set-up an account that provides similar functionalities.

In other words, it will be important to think at what point the data is sent to OGMR: do miners send information onto traders, which circulate it to OGMR, or do miners and traders send the information separately? Should OGMR have an on-going overview of data that is transmitted from one control point to the other i.e. is it alerted every time a field is populated or should a report be generated each month?

Careful consideration to this point will need to be given and an agreement found in consultation with OGMR. It will be important to clearly understand what reporting requirements OGMR has already put in place and try to reproduce these electronically through the software. For instance, during the field visit, OGMR informed the consultants that it was in the process of rolling out a reporting form summarising the information required from companies in reports, thereby facilitating oversight of the sector (see section on Oversight and Reporting as well as Annex 2). OGMR and BGR should carefully consider how this might be integrated into the software during the design phase.

Record Keeping

Draft Guidelines for the CTC Record Keeping Standard

Guidelines and procedures should apply to all actors in the value chain including mining companies, traders, regulators and others such as independent analysis companies. Below, we present some draft guidelines and procedures for record-keeping based on the observations of working in the field. These guidelines must be further reviewed and developed by the regulator of the Standard.

GENERAL GUIDELINES

A. Ensure that records are kept and stored of the processes of production/transformation.

- For mining companies, this might involve laboratory analysis, numbers and names of sub-contractors
- For traders, this might include the steps involved in processing the mineral (i.e. when/where was the mineral processed? By whom? How? Where was it taken next in the production chain? What tag/label has been affixed to the sack/drum etc?)
- For OGMR/the regulator, it is important to require a set of documentation/guidelines from companies. Information would include identification of mining operator or investor; identification of mining location; indication of physical notices and signs; indication about mine employees; salaries; health, safety and hygienic measures etc (see Annex 2 for the OGMR Form). In addition, when carrying out audits and spot-checks, the regulator should ensure that CTC requirements are met against its objectives and procedures.

Whilst recording this information is already done in practice in different ways (electronically in the case of ETI and Phoenix Metal and/or on a notebook for other companies), it is nonetheless the basis of assuring a supply chain

B. Share information. It is crucial for the CTC that the information contained above is shared between one actor of the value chain to the next. In particular, this will also be important for/prior to the point of aggregation. **Note that this does not mean sensitive, financial or otherwise information must be shared, rather the information required to trace material back to source.**

C. Centralise the information. This is the corollary condition of the above, since centralisation facilitates transfer/circulation of information. Circulating the information entails that reporting channels are opened and exploited, for instance between agents of the value chain and OGMR. Mine headquarters, traders and regulators should keep information in one central location.

PASSPORT SPECIFIC GUIDELINES

More specifically, guidelines that apply to the passport would include:

A. Filling-in Page A of the CTC passport: Outcomes from the collective and individual workshops have shown the necessity to think carefully about who would be responsible for doing this (see Part IV: Company Assistance). For instance, it will be important to discuss whether the first page should be filled-in by the sub-contractor him/herself or by someone else on his behalf and then signed by the sub-contractor (for instance in the event sub-contractors are illiterate and/or to avoid any challenge regarding the analysis of the material).

B. Filling-in Page B of the CTC passport: After gathering information relative to the extraction process and keeping a paper trail if necessary (such as carbon copies, notebooks etc); the company will need to fill in appropriate information relative to its own process of transformation (washing, aggregation, sampling, analysis etc). Ideally, this step will become electronic, either by using software and databases and/or even SMS technology (see section on Electronic systems). Companies may decide to rely on sub-contractors to produce this electronic page of the passport via SMS for example. Some mining companies also have supervisors who might be entrusted with this responsibility.

C. Filling-in Page C of the CTC passport: After selling the mineral production, the mining company/trader will carry out a further transformation process (washing and treatment, aggregation, sampling, packaging etc). Appropriate information relative to these modifications will need to be recorded and added on to information regarding the origin of the material (i.e. pages 1 and 2). In practice, traders already have employees in charge of logistics, and responsibility for filling in this section would go to these specialised staff such as laboratory analysts, loading supervisors etc.

D. Filling-in Page D of the CTC passport: This page will be produced to provide information on the loading of the container and include other forms already in use (C1, form of origin etc). Since data will already be electronic, it will be passed on/uploaded by the miner on the online software.

As indicated in the recommendations, these draft guidelines will need to be further adapted according to what emerges from pilot projects/trials using the passport. Ideally, they would also be subject to negotiation and exchanges between stakeholders to the CTC. In effect, running a pilot project for the passport and software would shed light on technical and/or practical difficulties associated with both. In addition, it will be important to see if and how these guidelines and procedures can/must be adapted according to companies.

Physical records

Hand written records and seals

Different solutions exist for implementing a system of physical records, some are rudimentary and filled in by hand whilst others are much more elaborated (i.e. tags). Altogether, they fulfil the same objective, which is to provide key information relative to extraction/processing activities, however how they achieve this varies greatly. The purpose of this section is not to discuss in detail how physical records are kept (see Figure 4 that describes the general supply chain above and Part IV: company assistance for this), but rather to provide an overview of the types of records currently used throughout the supply chain (electronic tags and/or barcodes are not currently in use but could be considered nonetheless).

Physical records used throughout the value-chain include:

- 1) Hand-written record in a notebook (date, mine, name of sub-contractor, gross weight)

Figure 16: Example of notebook kept at the mine premises



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- 2) Voucher given to miner with gross weight
- 3) Cardboard on pile of production (name and weight)

Figure 17: Example of cardboard on a pile of production



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- 4) Report of treatment (date, code of sample, code of lot, gross & net weight, origin, observation)
- 5) Analysis report (see Annexes)
- 6) Report of payment per sub-contractor (kept at the mine premises and at the company's terminal)
- 7) Stickers on bags before transport (type of material, quality and weight but not the name of sub-contractors who contributed)

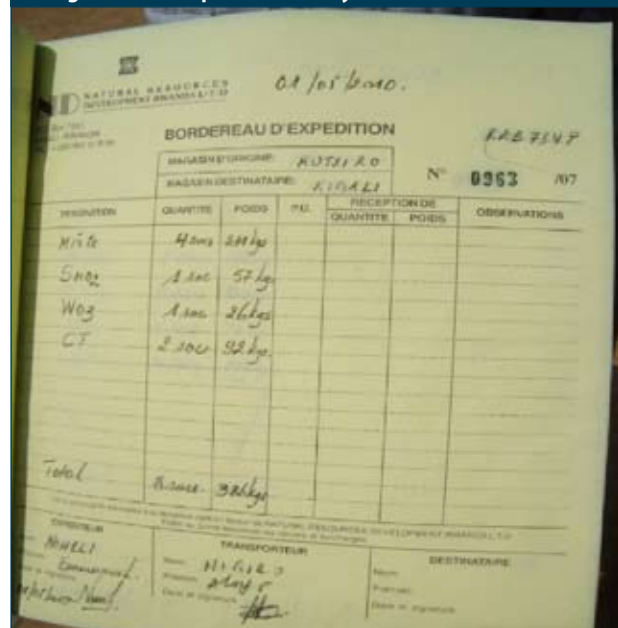
Figure 18: Example of records put on bags before transport



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- 8) Carbon copies of delivery note
- 9) Invoice

Figure 19: Example of a delivery note



BORDEREAU D'EXPEDITION						
MAGASIN/UNITE		KOTZIKO		N° 0363 / 07		
MAGASIN DESTAIRE		KIDALI				
DESIGNATION	QUANTITE	POIDS	RE.	RECEPTION DE QUANTITE	POIDS	OBSERVATIONS
Mite	4 sacs	28kg				
Sno2	1 sac	57kg				
Woz	1 sac	26kg				
CT	2 sacs	32kg				
Total	8 sacs	32kg				

CONDUCTEUR: MULLI
 TRANSPORTEUR: H. KIZO
 DESTAIRE:

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- 10) Seals (provided by Alex Stewart)
- 11) Analysis report (see Annexes)

Bar codes and tags

Figure 20 below contains illustrations of how Electronic tags could look like (either bar-code or radio-frequency identification tags (RFID)). Barcodes and/or RFID are usually incorporated into a product or commodity, and objects (like a car for traffic management), animal, person etc for identification and tracking purposes using radio waves (in case of RFIDs). Tags and barcodes usually require some special 'readers' in order to interpret and use the data that it stored within it. In other words, radio-frequency identifications and bar-codes contain two essential elements: readers, and tags/labels. RFID and barcodes are now designed in a way that would eliminate any paperwork trail.



Source: Helveta (2010)

The cost of such a technology varies greatly, depending on the size and functionality of the bar-code and/or RFID, as well as the reader. Some retailers will sell tags and readers in combination, whilst others will need to be bought separately. Also, some readers are also specifically designed for a certain function (e.g. asset tracking; inventory tracking; check-in and check-out etc).⁶

The use of said tags in the CTC scheme would need to be carefully considered, especially in terms of their disposability (i.e. can it only be used once, twice, or many more times; how does this impact on finances?) and practicality. In effect, technical advice would be needed with regards to how the tags would be used during the processing information. For example, if tags were to be added onto sacks at the mine sites and carry information relative to elements contained within it, would traceability not

be hampered at the moment where the mineral is processed (e.g. when the mineral is washed in machines and/or crushed)? In this case, would the tag be used to identify the point of extraction at the mine and identify the point of process only and be discarded thereafter, or re-used to track another segment of the supply chain (e.g. from the mining company to the trader's)? Again, technical advice would be needed to inform how eventual changes/losses in tags do or do not present a challenge to the traceability scheme.

Carbon copies

RCS investigated the possibility of using carbon copies as paper-support for the passport. Carbon copies are frequently in use everywhere in Rwanda, and can be produced locally. Prices can range according to the format/layout of the printing and the number of copies. As an indicative pricing, an A4 paper containing 2 carbon copies along with the original, reproduced 50 times would cost around 2,500RWF.

⁶ For an indicative price, see: <http://www.barcode-uk.com/> (accessed 2 August 2010)

Oversight and reporting

OGMR would appear to be the most appropriate body to regulate the CTC project as companies already report to them. If OGMR does become the regulator of the CTC system, it seems unnecessary to create a separate line of reporting; however, current reporting systems would need to be upgraded to include requirements introduced by the CTC scheme. In this case, record generated by the scheme should be submitted regularly and uniformly to OGMR which must have an adequate information management system to ensure proper oversight of the system.

In this context, OGMR has already implemented a more robust reporting system which is moving to become electronic. This reporting system includes a Mining Production form that needs to be filled in by companies (see Annex 2). OGMR is also in the process of generating a Mining Inspection form that would help centralising information that needs to be audited. The following paragraphs give a detailed description of the information to be filled in by the companies.

The Mining Production form includes information regarding:

1. Identification of the mining operator (such as name, address, mine location, number of mining license etc.)
2. Quantity of minerals exploited (quantity of minerals mined and quantity of mineral processed)
3. Monthly production (type of minerals, quantity in kg, grade of mineral ore, grade of ore concentrate)
4. Employees (categories, number and qualification)
5. Accidents or injuries (type of accident, number and cause of accident)
6. Mine exploitation (kind of mining operation, surface mine, underground mine, specific location of minerals, method for underground mines, method for surface mines)
7. Tools used in mining (includes tools, screening equipment, laboratory equipment)
8. Sales (minerals, quantity, price per kg, total price, buyer)
9. Research done (planned actions, actions, problems encountered, observations)
10. Environment (damages done to the environment, collaboration with government institutions)
11. Problems encountered during mining operations
12. Date
13. Signature and stamp

A suggestion regarding this form would be to include the name of sub-contractors or origin of the production (i.e. tunnel or vein).

The Inspection Production form includes information regarding:

1. Identification of mining operator (investor) (such as name

- of mine site, name of mining owner, name of responsible manager)
2. Identification of mining location (mine name, mine location, surface area, mine coordinates)
3. Notices and signs (observation, comments)
4. Mine employees (number of employees, qualifications, other related information)
5. Salaries (categories of mine employees, observation, comments)
6. Personal protective safeguards (such as head protection, footwear, protective clothing, eye and face protection)
7. Safety and hygienic services (such as emergency action plan, first aider and facilities, job safety, accident/injury reporting, water availability)
8. Protection of environment (environmental status, environmental reclamation)
9. Other observation that should be considered by inspector (physical appearances of mine, aspects of underground mine)
10. Methods of research
11. Tools used in mining (industrial tools, semi-industrialised machines, artisanal mining)
12. Production (minerals mined, average quantity mined per day and per month)
13. Market (potential market, future plan of the market)
14. Respect of laws (Mining and quarrying law, labour codes)
15. Problems encountered at mining site
16. Operator's representatives familiar with mines characteristics and activities (name, job title, signature, comments)
17. Date
18. Signature

In addition to the information that is being inspected, it would be useful to include a check-box in the Mining Inspection form about the CTC scheme. This would allow a centralisation of information for auditors.

Third Party Verification

In addition to the oversight and regular government checks provided by OGMR, record keeping systems should be checked by an independent third party auditor to verify compliance with the system against the standards set by CTC. Who this independent body is and how often auditing should happen needs to be determined by the regulators of the CTC. However, some guidance may already be given as a starting point regarding general audit standards.⁷

The examples given below are based on the auditing of financial statements but can be adapted to other types of auditing. Specifically, for CTC, the auditors should ensure that electronic records match paper records kept on site and in company record books.

General Standards

1. The auditor must have adequate technical training and proficiency to perform the audit.
2. The auditor must maintain independence in mental attitude in all matters related to the audit.
3. The auditor must use due professional care during the performance of the audit and the preparation of the report.

Standards of Field Work

1. The auditor must adequately plan the work and must properly supervise any assistants.
2. The auditor must obtain a sufficient understanding of the entity and its environment, including its internal control, to assess the risk of material misstatement of the financial statements whether due to error or fraud, and to design the nature, timing, and extent of further audit procedures.
3. The auditor must obtain sufficient appropriate audit evidence by performing audit procedures to afford a reasonable basis for an opinion regarding the financial statements under audit.

Standards of Reporting

1. The auditor must state in the auditor's report whether the financial statements are presented in accordance with generally accepted accounting principles.
2. The auditor must identify in the auditor's report those circumstances in which such principles have not been consistently observed in the current period in relation to the preceding period.
3. When the auditor determines that informative disclosures are not reasonably adequate, the auditor must so state in the auditor's report.
4. The auditor must either express an opinion regarding the financial statements, taken as a whole, or state that an opinion cannot be expressed, in the auditor's report. When the auditor cannot express an overall opinion, the auditor should state the reasons therefore in the auditor's report. In all cases where an auditor's name is associated with financial statements, the auditor should clearly indicate the character of the auditor's work, if any, and the degree of responsibility the auditor is taking, in the auditor's report.

⁷ US Generally Auditing Accepted Standards, 2010.

Part IV: Company Assistance

Summary

The consultants conducted a number of workshops and meetings during the length of stay in Kigali with each of the four mining companies, traders and government bodies including the OGMR and the Rwanda Revenue Authority. These were designed to discuss in greater detail issues relating to each individual company, present and refine the specific value chain as well as discuss any other issues with the stakeholders. The workshop provided companies with a collective as well as individual opportunity to discuss the record keeping standards for the CTC project and question the consultants. Having spent some time understanding the value chain through meetings and site-visits, individual workshops were also an opportunity for the RCS team to present its findings to companies and discuss as well as gain a better and more specific understanding of issues concerning each company.

Generally speaking, the same 'format' was used for each workshop, with the consultancy team starting by emphasising the relevance of the CTC project; discussing the unique value chain; discussing the passport as well as the My String software. Workshops were designed to be dynamic and foster discussions between participants.

Minutes and discussion points for each company are provided further below. Prior to that, we summarise the key concerns/issues that came out from both the general workshop as well as individual ones:

- Many companies/interviewees/attendees found it difficult to understand that the CTC scheme applies to mining companies only, not ASM. In many ways, this underpinned many of their doubts-comments about the success and feasibility of the CTC scheme. Although RCS emphasised this aspect of the CTC project, many participants still expressed doubts as regards the certification of a trading scheme that excludes artisanal miners. In the long term, therefore, stakeholders suggested that it would be ideal to include ASM to the certification scheme.
- Participants also expressed concern with regards to what could be considered unwanted 'redundancies' created by the CTC. In effect, many wondered if the introduction of the passport would put strain on their human resources and financial means. Whilst we believe that the passport would likely need to be changed following the outcomes of the workshops and according to each company, we also note that the scheme is designed to provide stakeholders with a workable solution. In fact, information contained within the passport is already generated by companies. The main lesson from this point is that, in order to increase participation the

CTC, it will be important to emphasise the fact that it utilises already existing systems.

- A third important point relates to production that is combined with material originating from the DRC or other countries. In particular, in the event a lot is complemented by minerals from the DRC, it is necessary to consider if the CTC scheme is able to trace Congolese minerals and how it might do so.
- Finally, there was a general agreement that government should be involved in the CTC. However, the scope of its involvement needs to be carefully thought about and discussed. For instance, more information, transparency and fluidity might be required with regards to reporting mechanisms. Similarly, some participants expressed the desire to see government take a more active role than purely oversight (see ETI). For example, government could set up an institutions and/or an independent laboratory that would be responsible for the analysis and assay reports, thereby providing more transparency and credibility to the CTC scheme. Some of these issues are discussed below.

General workshop

The General workshop was held on Tuesday 20th of July 2010 at OGMR. Company attendees included representatives of NRD (Anthony Ehlers), ETI (Leonidas Simpenzwe), GMC (Eustache Nzaremba) and WMP (Safari Ely and Jean-Malic Kalima). Christian Burafiki represented Phoenix Metal. Michael Biryabarema represented the Office de la Géologie et des Mines du Rwanda (OGMR). Jürgen Vasters from BGR was present and the workshop was presented by Harrison Mitchell, Marie Lintzer and Mathieu Tromme.

The workshop agenda was as follows: The aims of the CRC pilot Project were introduced (a. to certify and verify that material comes from Rwanda; b. to provide a complete visibility of the supply chain from point of production to point of export; c. to enable effective oversight by government bodies). The presentation then discussed the international relevance of the scheme, both by drawing on the example of the recent U.S legislation (see Box 1) as well as international best practice in record-keeping and transparency initiatives, mainly in the International Tin Research Institute (ITRI) (Phase 1 and Phase 2) and its Tin Supply Chain Initiative (ITSCI). Data transfer and generation used in ITRI (reproduced below) was also discussed as a potential inspiration for the CTC scheme. With this background information, the presentation then consisted in discussing the 'general' value chain applicable to the mining industry in Rwanda (see Figure 4).

Key deficiencies in record-keeping and a possible solution (i.e. the passport) were then identified and discussed. The debate mainly related to the most logical starting point for the scheme (mines or sub-contractors/tunnels). This was largely a question of accountability (should the passport and traceability system start at the company rather than at the team-leader, a position for which there is a high turn-over?). In support of this argument, some attendees insisted that the information should be relative to the company, rather than tunnels and/or team-leaders, since although mining companies buy from sub-contractors in most cases, the latter are sometimes drawn to buying from each other and/or completing their outputs from alternative sources without necessarily accounting for this sort of operation. Thus, data on miners at the ground-level tends to be 'slippery', and there may be difficulties in accounting for mining operations for each small miner/sub-contractor. Much in the same way, serious thought should be given with regards to the integration of different licenses in the CTC scheme – licences for companies, sub-contractors and cooperatives. Another side of the audience argued instead that the whole point of a traceability system is to be able to provide information on productive capacity (i.e. number of tunnels and miners). The point raised by this discussion is therefore worth considering further in the design of the CTC scheme.

Participants also said that for some companies at least, there are no systems to help transform data into workable solutions (e.g. where long-term trends can be identified and used for planning purposes). This also comes down to a simple lack of literacy in information technology and lack of facilities (no electricity, no computers, no internet coverage etc.). In response to this, OGMR suggested they would be both willing and able to provide this essential function of transforming data into information and OGMR could in that way become a trusted information centre, which is ideal for a government body.

When asked to opine about the oversight of the CTC, OGMR clearly expressed the opinion it had received a mandate to oversee mining operations in Rwanda and should continue to do so. In other words, it would be futile to implement another line of reporting, and current reporting systems should be upgraded instead to include requirements introduced by the CTC scheme. Allowing OGMR to oversee the CTC is also a question of credibility (for instance in the event the CTC scheme should be extended internationally and/or there should be interactions with ITRI). In addition, OGMR has already implemented a more fluid reporting system which should also be electronic so as to help with the generation of basic data. Ideally, OGMR's electronic databases and information should interact with stakeholders from the value-chain, and this comment came in handy since the software solution presented by the consultancy team also included such a possibility.

To finish, the consultancy team presented software-based solutions as a potential electronic version of the passport (see Part III, 'Electronic Systems'), and the general impressions were that My String was a much easier and more workable solution, not least for financial reasons. This was crucial information since the RCS team then prepared more detailed presentations about My String and its application to the mining industry in Rwanda. The workshop ended with a final discussion and Q&As around the electronic systems.

Individual workshops

Natural Resources Development (NRD) Ltd.

The workshop was held on Friday, 23rd of July at NRD's premises. All three RCS consultant were present. Attendees on behalf of NRD included Anthony Ehlers (Managing Director), Professor Prosper Nkanika (Chief Geologist); Claver Munyakaragwe (Electrician and Laboratory assistant); Samuel Harindinmuali (Processing Manager); Bernard Mdolo Huli (NRD Operations Manager). Jürgen Vasters (BGR) also attended.

The consultancy team started the workshop by presenting the U.S. legislation, with the audience agreeing that it made the CTC ever more relevant to NRD. The unique value-chain was then presented.

Like other companies, NRD's interest in the CTC is clear, however, a main challenge will be overcoming the technology gap (i.e. computer literacy and proficiency in MS Office Package; access to the internet etc). NRD raised this issue both in the collective and individual workshops. In effect, NRD keeps records of production and payment at the mine site (i.e. the sub-contractor signs for monies against a production record). An excel spreadsheet is currently used to record information relative to sub-contractors, number of members, and quantity produced. It was also agreed during the workshop that it is important to get information about the output produced for each mine site and/or tunnels, including the number of miners. This is essential in confirming the plausibility of production (i.e. that a certain amount of miners produce a volume consistent (if not increasing) on a monthly basis). Plausibility is important for auditing purposes, since it enables the cross-check of production against numbers of miners and mine numbers against payments.

NRD also confirmed that, in the long-term, all processing information will be shifted to Nemba (where work is underway to connect the site to the electric grid), as opposed to the plant in Kigali where processing is currently carried out. Ideally, this move would coincide with the introduction of new management and IT systems. Similarly, NRD operates a 'Northern' and 'Southern' site at Nemba, and production from both is aggregated and mixed as

all subcontractors produce the same minerals. This said, different 'grades' of mineral cannot be mixed and separation is realised according to the size of the material. After treatment, information relative to the original site of production refers only to the team-leader of a mine tunnel ('Belgian dump'; 'Germany tunnel' etc).

The meeting finished with the suggestion that NRD would be an ideal pilot company for the roll out of an electronic system of record keeping.

Wolfram Mining and Processing Ltd (WMP)

The workshop was held at OGMR premises on 28 July 2010. Attendees included on behalf of WMP Jean-Malic Kalima, Regional Director and Safari Ely, Logistics Officer, and on behalf of RCS, Marie Lintzer and Mathieu Tromme.

Unlike other companies taking part to the CTC scheme, WMP has already developed computer-based solutions for internal management, human-resources and financial matters. They have recently hired an IT technician who is developing this.

The RCS team first discussed the implications of the US legislation for the region/company in Rwanda, and, again, there was an agreement that this will bode badly for the industry in the DRC and in neighbouring countries. More particularly, the feeling expressed was that of bewilderment and misunderstanding, as WMP seemed aware of the negative implications this law would have for livelihoods. Conversely, WMP also acknowledged the importance of the CTC and similar certification schemes as a way to address the constraints enshrined in the U.S legislation. Overall, then, it was with interest and with the conviction the CTC should be implemented that the workshop continued.

The unique WMP value chain for Gifurwe (which was the only mine site the team visited) was then presented, which was useful in many ways. Still, this would apply to other WMP concessions. This allowed RCS to better understand the progress of aggregation, and how the process is done at each of the company's plants and at headquarters. Changes made to the value-chain have been reflected in the company's own value-chain (see Annex 2).

The consultants moved on to presenting the five main deficiencies identified (see Part II) and presented the proposed solution. With regards to reporting problems, WMP specified that it provides OGMR with an exploration report every 3 months and a summary of exploitation activities every month. A discussion ensued, particularly about the relevance of including specific information relating to sub-contractors. That is, whilst WMP accepted that sub-contractor's production put into bags can be identified through a label or tag containing key information regarding the mine site, name and number of sub-contractors/

miners etc, the main concern is that all traceability is liable to be blurred at the point of aggregation.

Therefore, it was argued that information contained within the passport should not apply to individual sacks, but to *lots*. The company expressed the wish of seeing some information relative to lot analysis and treatment, the reason being that WMP does not produce any sack analysis. In addition, the company stressed that individual sack analyses are too costly, and given that the quality of the mineral is the same (since it comes from a same mine site) and that what matters instead is the volume produced by each sub-contractor, analyses are made only after aggregation. There was also some element of confusion with regards to the relevance or not of including sub-contractors to the passport, as opposed to information relative to tunnels and/or production outputs.

In addition, as WMP does not use a 'trader' in the same way as other mining companies employ Phoenix Metal, questions were raised about the relevance of the 'trader page' in the passport and who would be responsible for filling it up. This is even more relevant as WMP itself has expressed the desire, in the long run, of being responsible for all logistical operations (in which case WMP will be responsible for filling in information on both pages of the passport, i.e. 'mines' and 'trader'). One consequence of this is that the page could be renamed instead to 'logistics'; and it will be necessary to consider whether passports should be tailored to each company.

Finally, doubts were also raised about the treatment of mandatory forms (C1, export documents etc), and more specifically their place within the passport and online. With regards to the electronic software to be rolled-out, thinking should be given to the place and format of said forms – will they be scanned and uploaded? Will these forms be electronically supported, and no longer on hard-copy? The former option, it should be said, would have important logistical implications, since many companies and government organisations (customs office etc) will have to be consulted to roll out electronic versions. In addition, it should also be noted that WBH already has a traceability system in place, both paper and IT-based, and it could be easily married with 'My String'.

During the workshop, additional information relative to the sealing, and loading of the minerals was obtained. Refractory Metals Mining Ltd RMMC, the logistics company contracted by WMP, is responsible for handling this. RMMC's supervisors (and, in cases, customs agents) oversee sample-taking, the sealing of drums as well as the container. Information relative to this is also sent to Wolfram Bergbau and Huteen Gesellschaft WBH (parent company).

Lastly, the consultancy team noted that WMP's 2009 audit noticed that the supply contract between WBH and RMMC specified that the material must be of African origin, but not that the material should originate from WMP's Gifurwe mine in Rwanda. This has since then changed at WMP's request.

Euro-Trade International (ETI)

Attendees for this workshop were, on behalf of ETI, Martin Kahanovitz (Chief Executive Officer) and on behalf of RCS, Marie Lintzer and Mathieu Tromme. The workshop was held on 29 July 2010 at ETI's offices. Overall, the conversation was very lively and many interesting suggestions were provided by ETI.

The conversation started around the U.S. legislation, which ETI had been aware of. In their opinion, industrial companies have to find a way forwards as they have a lot to lose from this. It was suggested that they might even pull together in order to pressure American companies themselves to travel to Rwanda in order to better understand the situation and see for themselves what checks and balances and/or mechanisms have been put in place so as to ensure transparency and traceability of minerals.

The presentation continued on best-practice in record-keeping. In the case of ITRI, whilst a system of traceability might be put in place via tags and corollary documentation, the main contention in ETI's eyes is the traceability of the money (i.e. there needs to be better ways of knowing where the money goes).

Discussion around the company's value-chain (Figure 21) allowed the team to better understand ETI's relationship with Phoenix Metal, its trading partner. For instance, although a lot of information is passed on to the latter, there is no indication relative to the names/numbers of sub-contractors, only the quantity and quality of the material. Whilst ETI knows specifically which sub-contractors are employed and what the production output from a mine/tunnel is, there is no need in their opinion to pass this information onwards to the trader. Should this occur there would be a significant amount of data to be disclosed, as there are many sub-contractors hired on the mine sites. This is a point that will be discussed again with regards to the passport.

ETI also highlighted another important issue dealing with seals: bags are sealed before being loaded on the delivery truck headed for Phoenix Metal, and ETI's own agents are present at the trader's until a sell price is agreed and the transaction terminated. The agents oversee the weighing, processing and sampling to ensure it tallies with ETI's own estimations.

With regards to the passport, the main contention for ETI was the feasibility of a 'sub-contractor' page and its subsequent integration to the 'Company page'. In effect, ETI reminded the RCS team many sub-contractors are employed. Disaggregating information relative to each of their input into the company's overall production volumes would be a tedious process





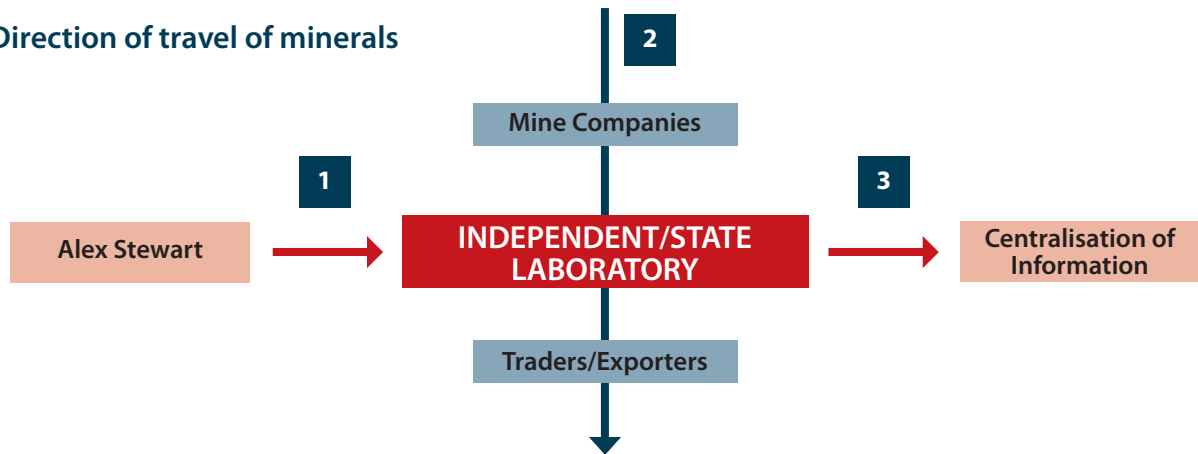
■ Source: ETI (2010)

which would likely involve hiring personnel. Effectively, the passport as it had been designed thus far would require ETI to fill in information about sacks and/or sub-contractors, but the numbers produced by ETI are so great that this would warrant additional human resources and financial efforts. The possibility of doing this electronically was discussed, with the participants concluding it could potentially be done. Therefore, in the case of ETI, the passport would ideally be reconfigured so as to include only volume information relative to the mine site rather than sub-contractor, sacks and/or tunnels.

Having presented the functionality and layout of said passport, ETI recommended several changes, which are reflected in Figure 22. These would consist of involving the government or a governmental body earlier on in the production chain. The idea would consist in creating a high-tech laboratory to which all mining companies could send their products. There, weighing, sampling, analyses and stamping/labelling would be realised. As an independent body, the laboratory would also be responsible for filling up the pages of the passport.

Figure 22: Alternative oversight to the CTC suggested by ETI

Direction of travel of minerals



Guidance:

1. In the event this redesigned organogram was chosen as a support for the CTC, it would be important to think of the role of Alex Stewart, especially as the 'State Laboratory' would effectively compete with AS. Therefore, a possibility would be for AS to oversee operations at the State Laboratory, provide material and man-power and/or be in charge of capacity building and training. Another idea, admittedly more drastic, would be for Alex Stewart and the State Laboratory to merge. Anyway, the size of the arrow here is meant to represent and remind the reader about AS's role in the value-chain.
2. The black downward arrow represents the route taken by the mineral from point of extraction to point of production, albeit in a simplified way (i.e without distinguishing all stakeholders). Two options present ourselves as regards the location and role of the State Laboratory. In effect, the Laboratory could intervene both as an intermediary between mining companies and traders. In this case, it would carry out the analysis and paper work (i.e. passport) required to guarantee a fair selling price and provide an authoritative judgment on the quality of the mineral. However, it could also be envisaged that the State Laboratory intervenes again after aggregation has been carried out at the traders. This is closer to what is happening at the moment, since laboratory analyses (be them carried out by Alex Stewart's or the company itself) are carried out at few crucial stages of the chain: when a sell price is agreed between mining company and trader, and after aggregation at the traders.
3. The main output resulting from the involvement of the State laboratory would be the centralisation of data and information and opportunity for independent analysis. In addition, this reconfiguration of the CTC would bring the initiative more credibility since it would make the government accountable for sourcing and analysing minerals. This laboratory would also centralise information relative to the CTC, which would be key in proving internationally that Rwandan minerals can be certified. This would provide a lot of credibility and confidence to buyers that minerals are conflict-free. Finally, it should be noted this recommendation is not new and has already been proposed before by ETI, and the company is ready to invest into capacity building with OGMR as well as equipment.

Source: RCS (2010)

However, it is worth thinking whether this scheme would be workable in the event the CTC is extended to artisanal miners. It is perhaps with this idea in mind that BGR and OGMR should think of the feasibility of this suggestion. In the event the CTC is extended to all sectors of the mineral sector in Rwanda, the way the laboratory handles logistics, payment etc will be important to determine.

Gatumba Mining Concession (GMC) SARL

Attendees for this workshop were, on behalf of GMC and Kivu Resources Bruce Stride, CEO of Kivu Resources (the major shareholder of GMC) and Chairman of GMC and Eustache Nzaramba, General Manager of GMC. Harrison Mitchell was présent on behalf of RCS.

GMC welcomed the introduction of the scheme and stated that the approach to the system, of using pre-existing data, made

Figure 23: AS sample bag



Copyright RCS Marie Lintzer

sense. Initial concerns were centred around the misconception that sub-contractors would be responsible for producing Form A themselves, whereas it is conceived that companies fill this form with a signature of approval from the sub-contractors. GMC expressed further interest in the electronic systems, and suggested that they would begin to take this up as soon as possible and integrate them into their existing systems of records. GMC showed the consultant that the company keeps sophisticated records at the point of aggregation which allows them to easily include origin in the aggregated material. The conversation ended with an extended discussion on the likely outcome of the US legislation on the mineral trade in the Great Lakes.

Alex Stewart

Marie Lintzer and Mathieu Tromme visited Alex Stewart (AS) on Wednesday 14th July 2010, with the intention of better understanding their involvement in the value chain. Attendees from AS included Mr Jimmy Wilson, Director, and Mr. Norman Mwashu, Chief chemist.

After introducing the CTC scheme and the purpose of the consultant's work, the attendees were invited to describe and discuss AS' involvement in the value chain and its relationship with the traders. AS has two functions: its inspectors oversee the

sampling and in-house chemists carry out analyses of minerals in Rwanda as requested by its customers. These are carried out according to international standards.

When a trader or company requires AS' input, the laboratory carries out and/or oversees the sampling at the trader's site, analyses the material within AS' own laboratory following which a report is produced, usually within 48 hours. This report is sent as required to the trader and/or the parent company/final client (not OGMR). Samples are contained within bags carrying information relative to the material, sampling date, seal number, customer and lot number (see picture below). In each process, four samples are kept: one for the client/trader; one is used for the analysis; one is kept in reserve in case of future litigation; and one is sent to the parent company (final client).

Services from AS are drawn upon by major traders as an authoritative and independent third party that can issue a content analysis that is made by the trader itself before export (in this case, AS ignores who the end client is and where the material originates from). Once again, it should be noted that AS' role is relevant only insofar as the trading chain includes industrial mining, as opposed to artisanal and small-scale mining (ASM), not least because analyses are costly. This reason was usually presented to the consultants as one explaining that AS is only called upon mainly at a later stage of the value chain, when minerals are ready to be sealed and exported (most traders are confident that their analysis is accurate enough to inform their decisions to buy from mining companies, and this is especially true when transactions involve relatively small volumes. For outputs above a certain volume, AS may be called upon if/when prices can be absorbed.

AS' independence is also required to seal the bags and containers before export, which it does alongside customs agents (see Phoenix Metal). Thus, in some cases, AS intervenes twice (once when a trader like Phoenix Metal buys a large volume of minerals and wishes to have an independent content analysis and once for sampling and sealing before the treated mineral is shipped overseas).

Minerals Supply Africa (MSA) Ltd

Marie Lintzer and Mathieu Tromme (RCS) interviewed David Bensusan (C.E.O) on Thursday 15th of July 2010 with a site-visit on Friday 16th of July.

Mr Bensusan provided the consultancy team with an overview of his business activity. Minerals Supply Africa Ltd (MSA) sells its outputs to Malaysia Smelting Company (MSC). 90% of MSA's tin volumes are imported from the DRC. Over the long term, MSA also intends to develop its own mining operations (as opposed to remaining a trader *stricto sensu*).

Acknowledging the importance of traceability, Mr Bensusan confirmed MSA is in progress of implementing phase 2 of the International Tin Research Initiative (ITRI). Mr Bensusan stated that MSC does not buy/pay for any material that is not accompanied by relevant ITRI documentation: certificate of origin for DRC and/or Rwandan minerals; customs documents; invoices; container inspection certificate; sampling certificate; export license; assay report; declaration of final export; C1 and C2 form (specific to ITRI, and containing information relative to the supplier and comptoirs in Rwanda); letter of transport; shipping letter; delivery note. This information is sent to MSC in paper and electronic copies, which is important for the regular audits undergone by the company.

The consultancy team then moved on to discussing the relevance of the forecast Rwandan Law, which Mr. Bensusan stated he was consulted for. He welcomes such a legislation, not least because it would allow to regulate the competition and cut-down smuggling. When discussing the U.S legislation, however, MSA sees this as a problem that will lead to the company losing out money and markets in the long run. Mr Bensusan also stressed the fact the application of the US legislation would ultimately lead to an embargo on the DRC mineral production, which could have catastrophic consequences on the local population. In the company's opinion, ITRI's value for money is a better solution to guarantee traceability of the material both in light of the U.S legislation and the CTC programme, of which Mr. Bensusan expressed doubts and concerns.⁸

Like in the case of Phoenix Metal, financial constraints explain that Alex Stewart is not called upon systematically to carry out sampling and analysis of materials. Instead, MSA has an internal laboratory which it relies on. Alex Stewart only intervenes as a third-party assayer and/or as an agent in charge of overseeing the labelling/tagging and shipment of the containers if and when the final client has requested it.

Phoenix Metal

This was the only workshop the consultancy team had with a trader. It was held on 27 July 2010. Participants included, from Phoenix Metal, Christian Burafiki, (Chef Comptable); Atticus Nyamunanage (Chef du personnel); Cadeau Umuhoza (controle interne) and Emile Ntigura (Responsable du marketing); Marie Lintzer, Harrison Mitchell and Mathieu Tromme from the RCS team were present as well.

Once again, the consultancy team began by reminding attendees the relevance of the U.S. legislation. To Phoenix Metal, interest in certification had already begun well before this landmark event, since many clients already demanded information on the origin

and transparency of minerals. They also take part to ITRI, as can be seen in their use of the C1 form (see Annex 5).

The group also discussed the process of transformation operated at the trader's premises, including washing, weighting and treatment. It appeared that information relative to sub-contractors names are not added on sacks. Whatever the weight or whoever the sellers (small-scale artisan or mining company), analyses are systematically done. However, how this is done can vary, mainly for financial reasons: a small quantity of mineral will not be sent to Alex Stewart (AS) for independent analysis, unlike larger ones where Phoenix Metal can justify the expenses. Samples are also taken at this point: one is kept by AS for cross-checking, another is used for Phoenix Metal's own laboratory analysis and the last one is kept in reserve. After the product has been bought and processed by Phoenix Metal, it is aggregated (meaning Wolfram, Cassiterite or Tin from different companies are mixed together). This said, Phoenix at all times knows the origin of the aggregate (i.e which outputs have been used and are included in which container). Four samples are taken before export: one is kept by Phoenix metal for a duration of months until the merchandise has been delivered to the final client; one is sent to Alex Stewart, another to an independent laboratory and the final one is sent to the consumer. In this way, any litigation over the material is likely to be fairly adjudicated. The minerals are then ready to be exported. They are sealed and loaded into containers for export, and all operations are overseen by AS as well as (in some cases) customs agents. Phoenix Metal, in other words, does not have any involvement in this, again, it was stressed, to prevent any wrong-doing and potential for contestation.

During the workshop, attendees from Phoenix Metal were also asked whether it is possible to separate CTC labelled from non-CTC labelled production. For big consumers, it is, as the volume and sale price justifies the costs of separation. In other words, this would be an interesting entry point for the CTC scheme since it only deals with industrial mining although this might be conditional on a minimum volume, sell price etc. Conversely, Phoenix Metal confirmed that it would not be possible to disaggregate between the two for smaller producers, not least because it would be costly to carry out sampling, packaging etc.

The consultants then extended the discussion to the proposed system, more specifically the passport option. A discussion ensued about the content of the first page 'sub-contractor'. In effect, Phoenix Metal informed the RCS team that, although some analysis might be made at the mine site, no information in this regard is transmitted to them at the point of sale, since most time miners seek the best purchase price for their production and prefer withholding some information about their own valuation of the minerals. This dynamic also explains why Phoenix Metal

⁸ During the interview, it was revealed that Mr. Bensusan (and/or MSA) is an important stakeholder in ITRI as it is part of the steering-committee.

systematically samples and analyses any production before offering a price. Thus, the suggestion made was that the 'analysis content' of the first passport page should be filled in 'a posteriori', once a credible analysis has been made at the trader's. Similarly, it was also suggested signatures for authorised staff and the miner could also be included with analysis results.

Overall, the RCS team had to repeat the CTC scheme applies only to four mining companies, and not the artisanal industry. This follows doubts that were expressed by attendees over the catchment and relevance of the CTC. In the same way, attendees raised doubts about the redundancy of this initiative, which called for clarification on behalf of the RCS team. Indeed, it was suggested that this scheme intends to complement and build

on processes and forms that are already in use by most agents within the value chain (miners, traders, government etc). Whilst being aware of the potential added burden the CTC would have on human and financial resources, the consultancy team attempted to explain that both hand-written and electronic solutions could be a complement to current processes. In effect, most companies currently possess some databases containing information relative to productions and processes (weights, financial value, analysis, dates etc). Therefore, it would be relatively easy to marry these with the passport and suggested software (see Part III on electronic systems). For example, Excel spreadsheets can be tailored and uploaded or sent to an address so that the electronic software converts these into detailed and treatable information relative to outputs and processes.

Summary: Key messages

- 1) **NRD** is still a long way from computerising information relative to its outputs and processes of transformation. Although there is the intention and accompanying budget to support this transition, a lack of computer-literacy as well as poor infrastructure (electricity) may complicate this.
- 2) **WMP:** information contained should not apply to individual sacks, but to lots. The company expressed the wish of seeing some information relative to sack analysis and treatment. In addition, as WMP does not use a 'trader' in the same way other mining companies employ Phoenix Metal, questions were raised about the relevance of the 'trader page' and who would be responsible for filling it up. This is even more relevant as WMP itself has expressed the desire, in the long run, of taking charge of all logistical operations (in which case WMP will be responsible for filling in information on both pages of the passport, i.e. 'mines' and 'trader'). Finally, doubts were also raised about the treatment of mandatory forms (C1, export documents etc), and more specifically their place within the passport and online. With regards to the electronic software to be rolled-out, thinking should be given to the place and format of said forms – will they be scanned and uploaded? Will these forms be electronically supported, and no longer on hard-copy? The latter option, it should be said, would have important logistical implications, since many companies and government organisations (customs office etc) will have to be consulted to roll out electronic versions.

- 3) Discussions held with **ETI** were crucial in revealing alternative options to the current CTC organogram/ oversight structure. As illustrated in Figure 22 above, it is necessary to carefully consider the role of Government, either as a relatively distanced regulatory body (which could compile information on the mineral industry, provide overall trends and statistics and act as an information centre) or as a proactive body with a necessary role in the trading chain (e.g in ETI's view, as an independent laboratory that provides assay services and is responsible for filling in information contained within the passport).
- 4) **GMC** was concerned that if sub-contractors were responsible for filling out form A themselves, then this would likely result in capacity issues very early on in the process. GMC welcomed the development of the scheme and stated that they were keen to implement the system in their company. As GMC is already producing many of the electronic information necessary for the process, the company suggested that it would adapt the process to match its already effective systems of analysis.
- 5) Another important point emerging from the workshops is that, because miners most time seek the best purchasing price for their production and prefer withholding some information about their own valuation of the mineral, the 'analysis content' of the first passport page should be filled in 'a posteriori', once a credible analysis has been made at the

trader's (either by the trader, the miner or even a third-party) since this would guarantee the nature of the product.

- 6) Awareness-raising efforts might also need to be considered in order to sensitise stakeholders about the remit of the CTC, since some participants expressed concerns regarding the added redundancy of the CTC and its relevance so long as it excludes ASM.
- 7) **Alex Stewart** is a third-party contributor to the CTC scheme, with its contribution consisting of sampling and analyses as well as oversight of the loading and sealing operations at the trader's premises. However, AS is called upon as an independent laboratory only when it can be justified financially and/or where the final client demands it.
- 8) Site visits and interviews with **Phoenix Metal** would suggest that information relative to sub-contractors names are not added on sacks. Aggregation is also made at the premises and four different samples are taken from the production before shipment. Phoenix Metal has also confirmed it would be able to separate CTC-labelled from non-CTC labelled minerals, only where big volumes are concerned, as the sale price would justify the costs of separation. This would therefore suggest that traceability could be financially viable as long as it includes industrial mining operations. Should the CTC be extended to ASM, it will be important to think about how traders can mitigate the extra costs of carrying independent assay reports without hampering their bottom-line.
- 9) Phoenix Metal's information relating to the content analysis included in the first page of the passport (i.e. that which is carried out at the mines, often with rudimentary tools) should instead be filled in 'a posteriori' once a credible analysis has been made at the trader's with more reliable tools. The importance and relevance of this suggestion is quite clear: many miners do not provide information regarding the production output even though the consultancy team discovered it is sometimes carried out, and/or analysis results can be easily falsified. It can also be recommended that signatures should be included with analysis results.

Conclusion and Next Steps

As a final statement, we believe that one of the first steps should be to give due consideration to the regulatory body that oversees the CTC system in Rwanda and elsewhere. In particular we note that should the regulatory body be OGMR, then significant capacity building is required in order that the body can effectively provide oversight of this system. Ideally, automated systems of reporting will be built into computerised electronic record systems that companies adopt. However, in order for them to do so, there must be continued input from OGMR during the design of this next phase.

We recommend that the pilot project to test out the record keeping standard be considered equally as a pilot of the regulator with the necessary support given to OGMR in order to build the capacity to effectively oversee the CTC system.

Finally, we note that there have been welcome moves by the industry to join up the most credible of existing certification schemes in the Great Lakes Region – the ITRI and CTC scheme. The pilot for this scheme is taking place in Rutongo Mines Ltd, and is a welcome next stage for the ongoing effort to certify minerals in the Great Lakes.

Please note that annexes have not been included in this document for reasons of confidentiality. Should you wish to see the annexes please contact us at contact@resourceglobal.co.uk

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Interview with Jane Baxter and Cyriaque Harelimana, British High Commission and DFID, 28th, July 2010

Interview with Alexander Sokoloff, U.S. Embassy, 28th July, 2010

Interview with Economic Attaché, Chinese Embassy, 28th July, 2010

Workshop attendance

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Leonidas Simpenzwe (ETI)

Eustache Nzaremba (GMC)

Safari Ely and Jean-Malic Kalima (WMP)

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